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Project Checkmate: testing for potential conflicts

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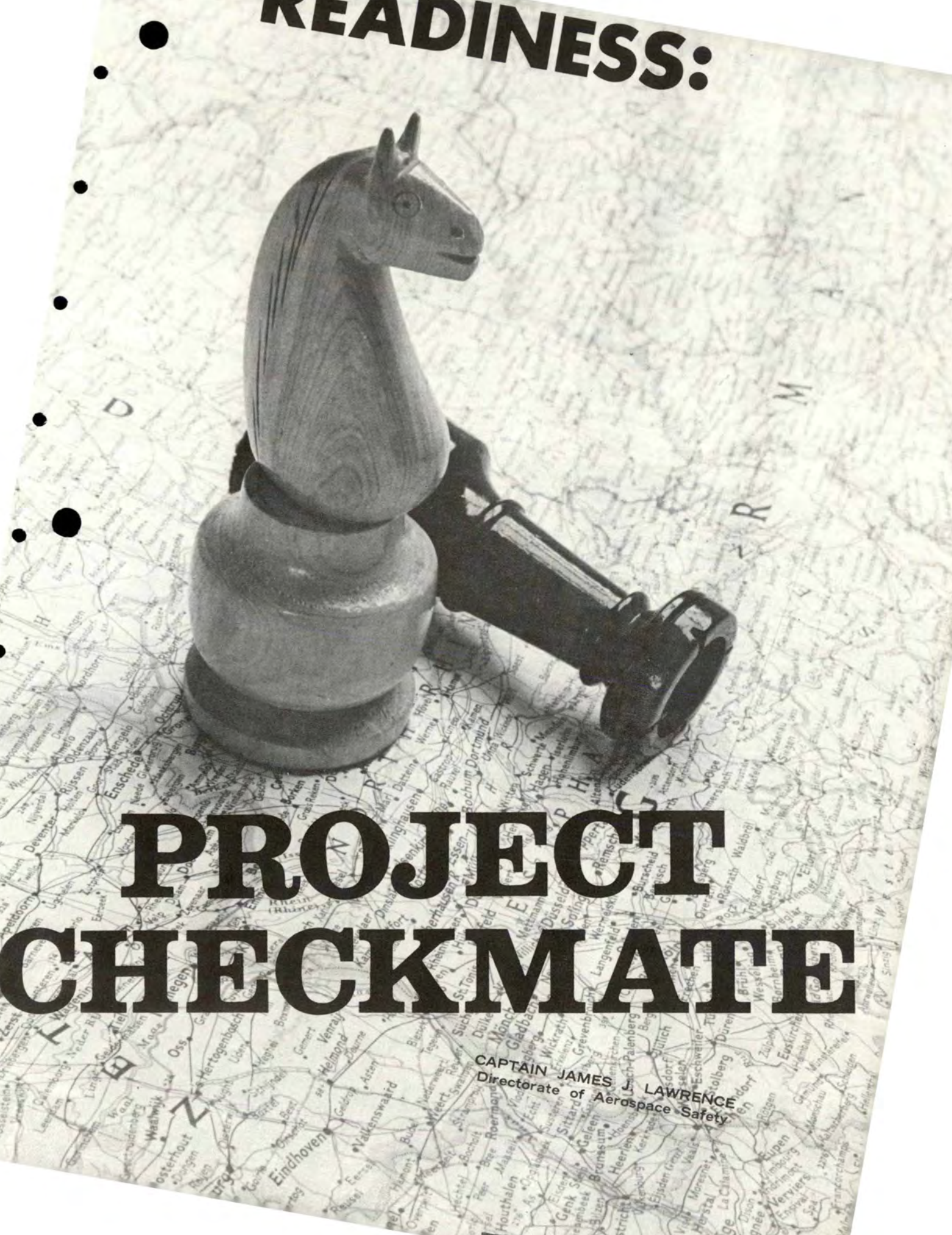
SEPTEMBER 1978 AFRP 127-2 VOLUME 35 NUMBER 9

READINESS:



PROJECT CHECKMATE

CAPTAIN JAMES J. LAWRENCE
Directorate of Aerospace Safety

General David C. Jones, former USAF Chief of S[illegible] now Chairman of JCS, during one of his frequent visits to Project Checkmate, located in the basement of the Pentagon.

Soviet command control was studied in-depth by the Red Team. They concentrated on identifying problems which would limit military capability.

READINESS, according to General David C. Jones is "the intangible lacing that takes modern aerospace systems, spare parts, fuel and other support items, training programs, and motivated, talented people and ties these elements into an EFFECTIVE FIGHTING FORCE." Readiness, therefore, is our ability to respond to any enemy threat.

To be sure this ability does exist, it must be tested. The past couple of years have been the era of readiness training in the United States Air Force. But training alone does not give the total picture of our ability to answer enemy aggression. War plans must be tested; support capabilities must be evaluated; tactics must be employed and evaluated. All this must be accomplished in light of the true enemy threat and their ability to exercise their military strengths.

This is the basic charter of Project Checkmate. In essence, Checkmate is an Air Force Chief of Staff created and endorsed activity which reflects his emphasis on across-the-board readiness. The Air Staff today is vertical in nature. Five Deputy Chiefs of Staff organizations and the Comptroller answer directly to the Chief of Staff as do 12 staff functions. The Chief believes that readiness issues must be addressed horizontally, incorporating the functional expertise of the vertically structured DCS's into maintaining an effective, coordinated fighting force. To evaluate our successes and failures in achieving this goal is one of the major objectives of Project Checkmate.

Before going into the nuts and bolts of how they do this, let's set the stage with some background on how this project originated and developed. In November 1976, General Jones voiced a need to establish a unit to evaluate across-the-board readiness to execute wartime operations. Although readiness had long been a concern of the Air Force command structure, problems remained and possible solutions were slow in surfacing through the Air Staff process. Someone needed to take a big picture look at the integration of DCS responsibilities to identify exactly where the hang-ups were and to propose solutions. Major General Hoyt S. Vandenberg, Jr., Director of Operations and Readiness, took the initiative to form the group envisioned by General Jones.

Project Checkmate, appropriately named by Brigadier General Louis C. Buckman, Deputy Director for Combat Readiness, was begun with a core of Air Staff action officers. It was placed under the Plans and Operations DCS (XO) but was not considered a normal Air Staff function. Its special status allowed Checkmate to avoid roadblocks sometimes inherent within normal Air Staff coordination procedures and provided Checkmate with a direct communication link to the Chief through the XO chain.

Its original charter was to identify those factors which will tip the scales in the United States' favor in a conventional conflict concentrating on a European/NATO scenario. The checkmate organization was formed by drawing upon personnel from across the functional DCS staffs with only the brightest and most successful action officers identified for the initial cadre. It was supplemented by experts from many federal agencies on an as-needed basis. The regular staff numbered 14, with as many as 20 augmentors used at a given time.

The setting was one of a think-tank approach. The staff would not be constrained as to what they could look at and what they could say. They were free to dig into any aspect of war plans and force responsiveness. In their own words they "concentrated on the macro approach with many, many snapshots into the micro." Checkmate was privy to intelligence information from all sources.

One of the most unique aspects of Checkmate is their extensive reliance on operationally oriented officers to evaluate and apply intelligence information on Soviet capability. These operators know the problems that the Soviets may have because they understand how operational problems affect our capability. By analyzing capability versus operational deficiencies, we now have our best picture ever of how strong the Soviet military is and how far its arm can extend.

Project Checkmate was divided into two groups—the Red Team and the Blue Team. The first few months after inception were spent in total academic

study. The Red Team devoured every open source background reference on Russia that they could lay their hands on. The idea was to get them thinking in the Soviet mentality. They studied the history, economics, politics, and social structure of the U.S.S.R. The intent was to lay the groudwork for a glimpse at Soviet strengths and weaknesses from a Russian point of view rather than an American perspective. In other words, avoid a mirror image.

After this education process was complete and the team felt confident that they possessed a good feel for Soviet mentality and aspirations, closed source literature came next. Armed with the necessary security clearance, the Red Team members began the arduous task of establishing contacts and confidences within the intelligence community. These sources revealed tons of information that now had to be sorted, aligned, and analyzed. Formerly established capabilities were re-evaluated from the operator's viewpoint. The Soviets' ability to integrate their forces and logistics support was studied, just as the Blue Team was doing the same thing with NATO forces.

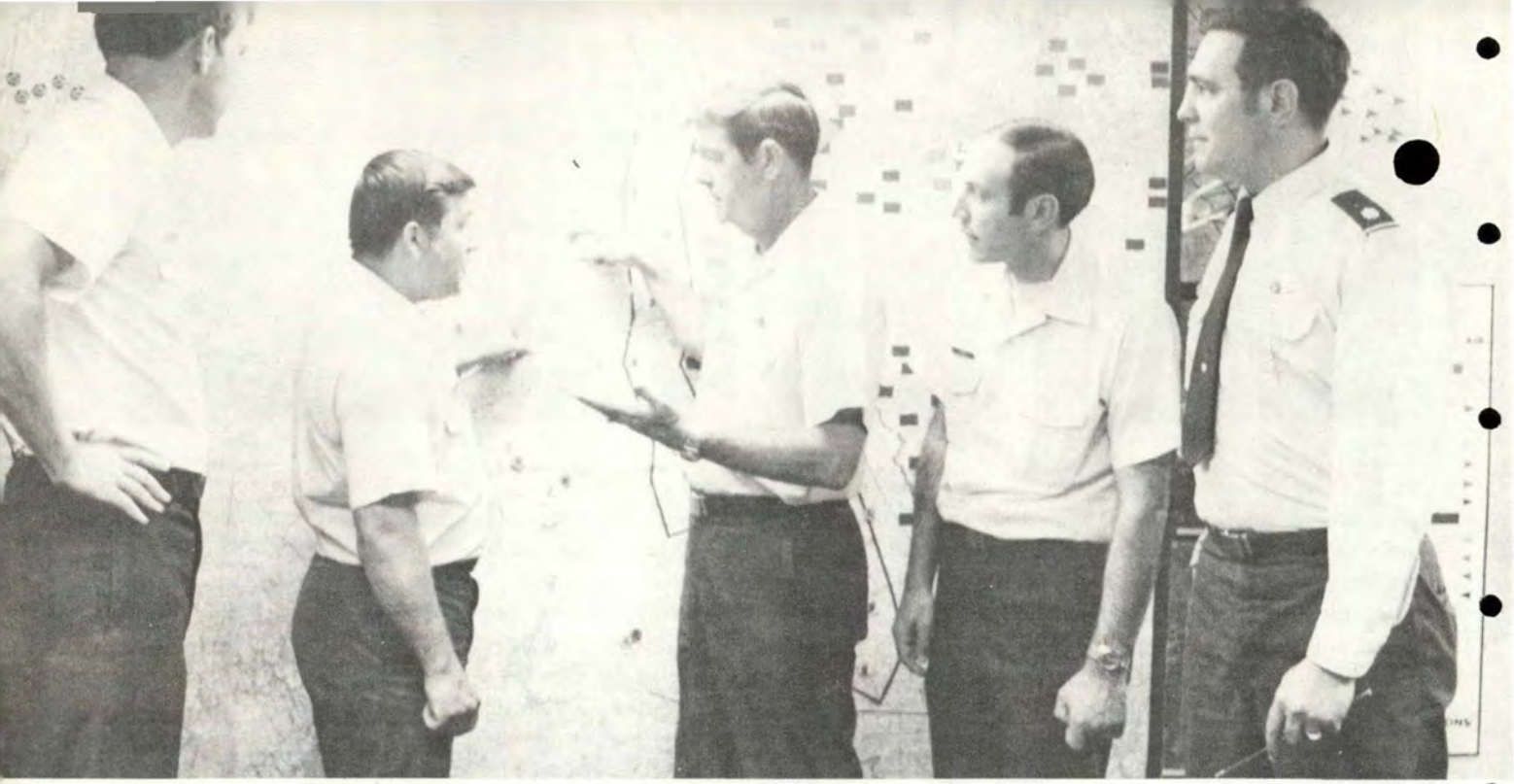
The Blue Team was doing a good deal of studying themselves. Functional expertise can often lead to tunnel vision; and that is exactly what they wanted to avoid. Each man was tasked with finding out as much as he could on what each DCS and SOA was doing in each operating area of concern. They also became blue suit experts on US Army and US Navy operations, goals, and effectiveness. Informal assistance was sought and contacts were made with Army and Navy operational personnel. NATO plans were analyzed with a real-time look at the ability to carry out those plans. Military forces were tabulated and indexed down to individual aircraft. Materiel levels and resupply capabilities were studied. The question was: "Could we really do what our plans said we could?"

The purpose for the Blue Team, and Checkmate in general, is not to create insurmountable evidence for new or more weapon systems. The goal is to deal more in the "now" capabilities necessary to do the job with present resources. They tried to analyze the use of forces in the NATO community to see if the pieces fit. They concentrated on force requirements, mission area analysis, doctrine, targeting, etc. The things they found wrong were, for the most part, readiness items not requiring high cost fixes. Typical problems were in use of transportation, storing of ammunition, war tactics, and an item called the friction of war. Friction of war is essentially the wartime application of Murphy's Law; the conflict and confusion of battle will encourage anything going wrong which can possibly go wrong.

Thus, educated and ready, the Blue Team and the Red Team prepared to square off. Armed with "hand-held calculators and loud voices" the conflict was to begin. The first problem, however, was to decide how to start the war. Do we attack? Do they attack? A gradual increase in international tension or a sudden no-notice aggressive action? It soon became apparent that there was no easy way to arrive at an answer. Rather than to get involved in a doctoral thesis-type analysis of the why, they decided to limit the subject to the how.

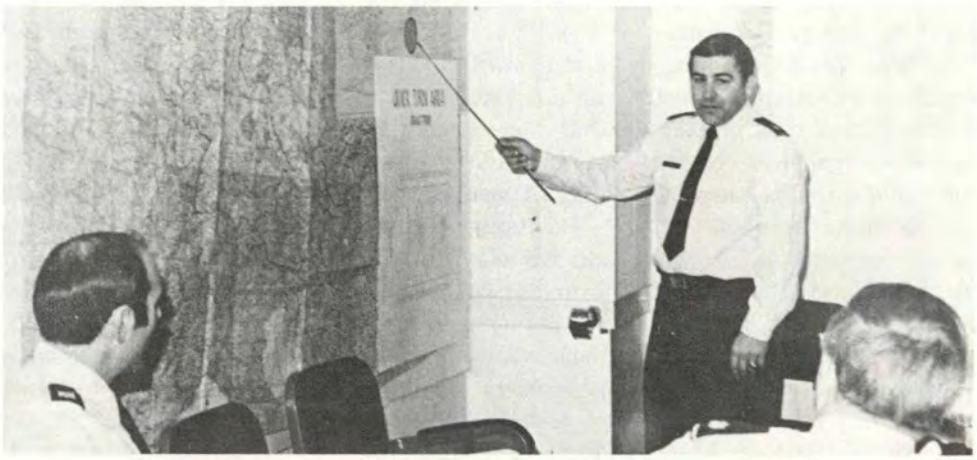
In-depth study of the Russian mentality and the lay of the land between the Warsaw Pact and West Germany made the initial thrust points fairly obvious. The Red Team set themselves up as the Russian general staff and controlled all the military resources on the front as well as resupply capability. The Blue did the same with all NATO forces. The battle that ensued was a minute-by-minute look at what we could expect to see in such a confrontation of Warsaw Pact and NATO forces. The exercise lasted several weeks to fight a realistic conflict. Unlike other agencies which deal with war gaming and use computer modeling, Checkmate was a physical exercise of direct simulated contact.

The enemy launched forces, and NATO answered the aggression. Sorties were generated and tracked on a by-aircraft basis. The limited airspace and territorial characteristics of that geographic area resulted in surprise as well as planned engagements. Kill rates and battle damage rates were determined by more than just preordained percentages; surprise attacks, aircraft altitudes, fuel state at time of engagement, ordnance on board, and experience from the Vietnam and Middle



The move/counter move approach of the exercise makes the name Project Checkmate very appropriate. Here, team members discuss the effect of the shift in t enemy's offensive thru

A familiar sign around the Readiness Analysis & Initiatives Group (Project Checkmate).



Above—Logistics Checkmate personnel review NATO Quick Turn procedures to determine our true state of readiness. Left—Red Team and Blue Team members discuss offensive strategy during a Checkmate briefing to senior DOD a AF peop

East wars all entered into the formula for estimating airborne successes or failures. Surviving aircraft were recovered, wherever able, and rearmed and refueled for further missions.

The logistics people carefully tracked fuel and munitions levels. If an aircraft was recovered at a field without munitions support, then that aircraft was out of the war until it could be fueled, flown to a destination with the proper munitions, and quick-turned for more combat. Ground losses by the NATO forces were also looked at in-depth. Enemy strengths versus our defense capability and the evaluated effectiveness of their weaponry determined what logistical support was destroyed. What was left was employed based on the physical ability (including allowing appropriate rest periods) of the load crews and support people actually assigned to NATO forces.

Details of the exercise results cannot be discussed here. The benefits, however, can. As the forces and defenses were employed, they revealed several problems on both sides in the conduct of a conventional war. As a result, the Checkmate personnel were able to analyze our problems, reason out alternate methods, then resubmit them into the scenario to gauge their effectiveness. This was especially useful in light of the enemy problems identified.

Since the initial exercise, Checkmate has continued to work steadily toward refinement of solutions and ways to minimize problems. The staff, of course, are not decision-makers. They identify problems and pose solutions to the commanders who can implement the needed fixes. Several important changes in strategy, tactics, and equipment have surfaced since the start of Checkmate. Checkmate also serves as an education forum for readiness matters. The knowledge gained during the first engagement and the many iterations since have evolved into an excellent briefing on the state-of-readiness in the European theater. For 3 hours those attending are exposed to a possible NATO/Warsaw Pact conventional war—seeing it and having the opportunity to reflect on it from a view encompassing all related functions.

This briefing is given on an as-needed basis and popular demand has driven the frequency of the presentation up to approximately twice a week. The list of dignitaries who have attended is truly impressive, and the audiences are an interesting composite of people from all levels and branches of government.

Readiness is a high-interest item with Congressional and House staffers. Several Senators and Representatives have also taken time from their busy schedules to see what the Air Force has to say. The Secretary of Defense and Secretary of the Air Force and many on his staff have attended, as have representatives of several other federal agencies. The Army and Navy have been well-represented by their command staff, as well as briefings to numerous NATO commanders.

Checkmate is by no means a static presentation. The studying continues. The Checkmate staff constantly meets with the intelligence community and functional experts in the Air Staff and other services. As more new things are learned, the briefing is updated and more recommendations are made.

Perhaps the biggest reason for the success of this project is the high motivation of the participating personnel. The assignment has changed the life styles of the people involved. Their outside reading is now geared toward works on Soviet life and military tactics. People give up leave and off-duty time to attend scheduled briefings. Each man has been able to learn enough about the other guy's area to be considered an expert. Air Staff problem solvers seek out Checkmate's advice because of their knowledge and skill in looking at problems across the vertical organization. The education they have received has got to be equivalent to a postgraduate degree in international relations and military strategies. As one man put it: "I'm totally pleased and amazed that I'm being paid for this excellent opportunity to learn."

Aerospace Safety *magazine wishes to thank Colonel E. F. Martin, Chief of Project Checkmate, Lt Col W. R. Topp, Blue Team Chief, Lt Col J. A. Norden, Red Team Chief, and all the personnel of the Project Checkmate team for their cooperation and assistance during the research for this article.* ★

MAYDAY, MAYDAY- I'm Going To Ditch

CAPTAIN GEORGE R. JACKSON
43d Strategic Wing

The following is a true story of a ditching incident off the coast of Saipan as told by Captain Ray Starling (Andersen AB Legal Officer) to Captain George Jackson (Andersen Flying Safety Officer). The incident began at 0545, Saturday morning, 11 March 1978.

After completing normal morning activity, Captain Starling looked out on another beautiful morning on sunny Guam. A clear day with little wind, it was perfect for his first cross-country solo in the Aero Club Cessna 150. After breakfast, he was off to the Naval Air Station Aero Club to meet his instructor.

Major Art Lund arrived at 0705 to open the club office. He is a radar navigator assigned to the Bomb Nav Branch at Andersen, and, on weekends, is an Aero Club instructor. This Saturday he was helping Captain Starling plan and coordinate a solo cross-country from Andersen AFB to Rota, Saipan.

Everything was quite normal through pre-flight. All instruments looked good and all survival items were in place. At 0805 Captain Starling got clearance for takeoff. Minutes later he was level at 5,500 over the water. There were very few clouds and visibility was unlimited; it just couldn't be better—or could it?

Halfway between Guam and Saipan, over open ocean, with no emergency fields nearby, the engine rpm suddenly decreased to idle. Captain Starling tried to adjust the throttle, but the rpm would not increase. Next, his emergency training seemed to take control. He performed the steps his instructor had taught him for just such an emergency. First, fly the airplane (sound familiar?). Next, trim and airspeed (this is beginning to sound like Major Ware's briefing from the Certified Flight Instructor Course for B-52 IPs). With the airplane under control, Captain Starling made his Mayday transmission.

Guam Approach responded to the call and monitored the aircraft position while Captain Starling continued his futile attempts to increase engine power. After several runs through the checklist and a conversation with Captain Milchanowski, another Aero Club IP, Captain Starling told approach that he couldn't make Saipan. He was going to ditch.

When he realized he couldn't glide to a land base, he began to review ditching procedures. He checked his personal equipment, and everything was in place. The life vest was securely fastened and the raft was within arm's reach. Restraining devices were tight, and Captain Starling was ready for the final phase.

He turned the aircraft into the wind and waited. Initial water impact was not severe. He had taken worse falls while water skiing. As the tail hit, the nose dove into the water at a 60° angle. The next sensation was water in the cockpit. He removed restraining devices and opened the aircraft door.

As he exited, he shoved the life raft out the door. Once he was in the water, the waves pushed him against the airplane. This caused some problems. He was forced under the water as the wing came down near his head. Finally, he got clear of the airplane and found the life raft, but another problem developed.

The sea anchor on the raft was entangled in the airplane. As the airplane sunk, so did the life raft. Frantically, he pulled and gnawed at the ropes (sure could have used a knife about then). Finally, the ropes came loose, and the raft was free. He crawled in the raft and waited for rescue.

At 0920 the rescue chopper arrived, and out jumped a frogman with a buck knife in his teeth (you guys are here to rescue me, aren't you?). Captain Starling told the frogman he could swim, and he wasn't hurt. Then came the shocker. The frogman punctured the life vest and the raft. This action prevented either item from being sucked into the helicopter's rotors; however, the action didn't do a thing for Captain Starling's confidence. As he floundered in the water waiting for the chopper and its horse collar, Captain Starling drank a gallon or two of ocean. Finally, the collar was secured around the victim and Captain Starling was pulled to the safety of the helicopter.

The rest of the story is a happy ending. Wife, instructor, and FAA official were all relieved to see Captain Starling when he got back to the Naval Air Station, but the story isn't quite over. There are certainly some lessons to remember (none of them are new).

First, Captain Starling used all the flying ability he had, to think and analyze the situation. Remember the poster with a Cessna 150 and MAC 141 which reads: "Both Require Proficiency and Judgement"? Well, it's certainly true. Ditching a fixed gear airplane is no good deal, but training and proficiency really paid off.

Second, don't assume the aircraft is useless when initial impact occurs. You have survival equipment, but you must know where it is and how to use it.

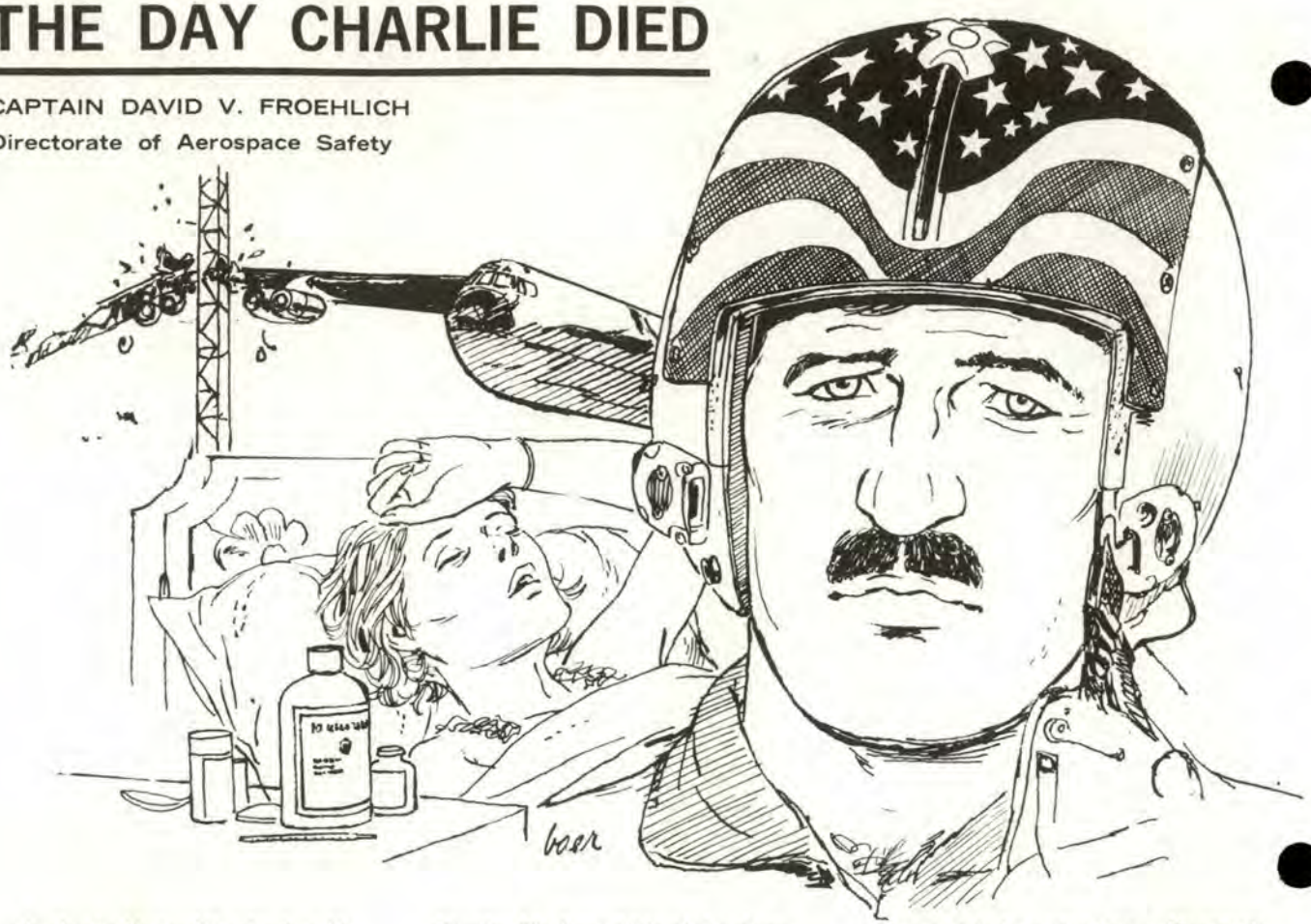
Finally, the rescue is not complete just because SAR arrives. All your land and sea survival training is worthless if you don't do your part to help the rescuers. ★

ABOUT THE AUTHOR

Captain Starling had less than 100 flying hours at the time of the accident. Captain Jackson is the Andersen Flying Safety Officer and a B-52 Instructor Pilot with 2,400 flying hours. Both learned much from this experience. We hope you have also.

THE DAY CHARLIE DIED

CAPTAIN DAVID V. FROEHLICH
Directorate of Aerospace Safety



Author's Note: Charlie is a fictitious flyer. He is the guy who sat in the left seat, flew on my wing "up North," yelled at me from the back seat or hovered over me while I was pulled up on a cable. Charlie is the aviator with the mental and physical ability, and skill, but through some disregard of rules, limits or flight discipline, he kills himself (and mayhaps others). Those of us who fly, either have known or will know, a Charlie, before he kills himself.

Charlie felt like the most senior captain in the Air Force. He missed the last O-4 board by 2 days and then the "power" decided to delay the next board "in order to . . . (mumble, mumble, mumble)." When it comes to pilots, Charlie's a pro. He left UPT and traded in his white rocket for an eight-engine aluminum overcast at Castle. He found his niche, however, and became a "good" copilot. A "good" B-52 copilot would usually be a "great" copilot in the right seat of any multi-place machine that also carries a loadmaster, flight engineer, steward or the other folks that do all the same stuff a *Buff* deputy does.

Minimum time and several *arclight* tours later, Charlie upgraded to the left seat and got his first crew. Shortly thereafter, he put in a 1-year tour as a "NAIL" and came straight back to the land of snow and ice and Buffs.

Everything in his first 11 years had been normal progression. Smooth until last year as a matter-of-fact. Then things began to sour. The Mrs. had taken ill.

At first, she was just sick enough to be misearable most of the time. The docs at the local USAF facility had thrown their hands up and not been able to volunteer a diagnosis. Charlie had taken leave to take her to a "specialist." No luck there either! So now Charlie didn't know anymore than he did at the beginning. That was the most serious problem, but all the little gremlins seemed to be cropping up at once.

The mission planning had been done on alert. It seemed like a good idea and had been done for years that way. Charlie, however, always had a nagging feeling that he just didn't have quite the handle on the upcoming 10-hour flight that he did when the planning and briefing were done the day before. Let's see, might as well start sorting through the mountain of paper in the mission folder. Flight orders—boy, a crew with two captains, three lieutenants and a tech. I remember the days with nothing but majors and L/C's on crews.

The mission—we drew a good

one. Heavyweight T/O, fighters running intercepts, high runs, refueling, low level with racetracks and back home for a few approaches. Not missing much! Weather? Great, as usual! Multi-layered cirrus for the fighters, high runs and refueling; low crud with thunderstorms and possible turbulence for the Oil Burner. That's just what I need! What? Phone call. "Uh—OK, be there in a minute."

Charlie's mind was not running at the 100 percent mission concentration level. The phone call was from his wife letting him know of another small domestic problem. Normally, no biggee! But today, it was just enough to send his mental computer and patience bank into overload. He returned to his premission briefing. His attention wandered; he snapped at the nav and the EW during the briefing and left his checklist in the mission briefing room when the mob got on the bus. Definitely didn't have his act together.

Pre-flight was OK and they went back outside for a stretch before engine start. Charlie knew it wasn't his day when the stanboard hatchet man arrived with seventeen sharpened pencils and announced "Just thought I'd ride along and give your 'co' a no-notice."

Takeoff was normal—as normal as a 10,200 foot takeoff roll can be. The half million pound machine staggered toward flight level, and an hour and a half later they were the target for jocks out of a nearby fast-mover base. Intercepts and high runs went OK, but Charlie could tell that his "suite-mate" was nervous.

He remembered the feeling. As a new guy, he had worked hard at his job as a copilot, but it always seemed that whenever an evaluator crawled on board "the harder he tried, the behinder he got." Some stanboard folks (the minority, unfortunately) were better than others. Some had the knack of putting you at ease, letting you do your job and yet giving you an evaluation that really helped you improve as a crew member. This guy wasn't like that!

Charlie found the tanker in the thin soup. "Stabilized—pre-contact —ready." "Damn!" Charlie silently cursed the bureaucrats for his lack of proficiency as he slid out of position. You can't be good at this when you only get to do it once every 2 or 3 weeks. You're also supposed to help the "co" learn how to refuel, too. Fat chance!

Charlie was working hard! In and out of the clouds, he hung on, got the gas and then relaxed and got two more contacts. He hung on extra long the last time and didn't even offer the right seater a practice shot. When the final disconnect came, he saw the copilot look at him with "Thanks, I didn't need that" in his eyes. They had an hour before low level entry and Charlie needed a stretch. He had just realized how really tired he was already and there were still 5 hours to go.

Charlie harassed everybody on the way downstairs and back up again. A good-natured harassment about job, leave, and miscellaneous. Harmless, except on the way back up, Charlie began to think about wife, family, and problems.

Concentration broken! Strap back in—everything OK? Get ready for low level entry. Weather? Yuk! Just bad enough to make life miserable, but not bad enough to cancel. Checklists accomplished. "Boy, she really sounded bad when I talked to her before takeoff. I sure am tired; what, oh yeah, leaving FL 240 for 160 enter OB- . . . ."

Through the low level (flown at IFR altitudes because of weather) everything went OK, and the first bomb run seemed good. On the second racetrack, Charlie's concentration began to wander, his tiredness showed in heading and altitude control. He snapped at someone on the intercom and missed a radio call.

Turning inbound to the IP. What's that light! Hydraulics! Co—take the airplane, I'm gonna check out the hydraulic problem! What? A generator out! What radar? Yeah, I know the heading, I'll roll back in a minute . . . .

Charlie was a competent pilot. That day he had no business in an airplane. On a VFR day with no problems and no additional factors (stanboard/emergencies, etc.), he probably could have handled everything, but this day he couldn't. The mission was complex, the weather was bad, the machine began to come apart and worst of all, he was tired and had too much on his mind. At the critical moment, his mental and reaction computer overloaded and he stopped flying the airplane just long enough to overshoot heading, lose 600′ and collide with an 1867 foot tower. The IP and copilot were intent on the electrical panel; the RN and nav were setting up for the next run. Nobody noticed until it was too late. Charlie could have handled it all if he just had his stuff together and his head on straight.

Mental overload killed Charlie and he took six others with him. No causative aircraft malfunction will show up in the investigation; the aircrew qualifications and experience will indicate no reason for the mishap; the 72-hour histories won't give any major clues; crew rest was "not" a factor! The mass of twisted metal will not answer any question. CAUSE: UNDETERMINED. That was the second day Charlie died. ★

OPS TOPICS

LOOK OUT

A recent survey showed that more air misses occurred at lunchtime than any other time of the day or night. Now, many theories have been put forward as to why this should be so, but the one I go for is too many people with their eyes on their lunch and not outside the aircraft. Be warned. Looking out is your last, and most effective, line of defense. The statisticians have now proved that you need your eyes most at lunchtime. (RAF Flight Safety)

STEER CLEAR

Hail yes! Recently a heavy was exiting an IFR low-level route structure heading for the "high exit point." At approximately 18,000 feet in clear air, the crew encountered what felt and sounded like rain. Nearest heavy clouds (on radar) were 17 and 22 miles away respectively. Over $3,000 worth of hail damage resulted from phantom hailstones estimated to have been carried over 20 NM by high winds aloft.

EMERGENCY DECLARED

A fast-mover was in the pattern of a round-robin base shooting GCA's. After the last low approach, the crew received clearance to return to the home drome. During the next few minutes, due to frequency switchover problems and an emergency in the aircraft, things went sour. Happy ending—crew safely landed at the round-robin base, but their declared emergency never made it. The emergency slipped thru the crack and had they needed the fire and ambulance folks, there was nobody waiting. Moral—Make sure that everyone gets the word when you've got a sick bird and are limping home!

LANDING OPTIONS

When a landing is not going just right, the pilot has to make a decision to (1) make any necessary correction, or (2) take it around. The latter action is often the wisest move but one of the hardest for a pilot to make, regardless of his experience level. Recently an aero club pilot was distracted during base turn and forgot to lower the flaps. Consequently, he landed fast and probably three-point or nose wheel first and got into a porpoise. With more experience, he should have been able to salvage the situation by either establishing a proper landing attitude and adding sufficient power, or by abandoning the landing and going around. He did neither and the aircraft ended up gear in the air. There have been several landing accidents in commercial aviation in the past couple of years which stimulated a number of articles on the landing vs go-around decision. Almost all flights end with a safe landing and pilots develop a mental set that tells them they are going to land—not go around. Instructors would be providing their students a real service by developing a clear understanding of the options during landing and that going around when in doubt is the mark of a wise pilot.

EYES OPEN!

The B-52 had turned inbound from the racetrack prior to the radar navigators TIP. The pilot observed a light aircraft at about one and one-half miles. The light aircraft appeared to be at the same altitude of the B-52, 9000 MSL. The B-52 began a climb and crossed directly over the light aircraft at an estimated 400 to 500 feet. The light aircraft was observed to have taken no evasive action. Good job! Don't let bomb runs or IFR altitudes keep you from seein' and avoidin'.

OPS TOPICS

WX ALERTS

In May new SIGMET procedures were introduced, but probably not everybody knows about this. A convective SIGMET which implies severe or extreme turbulence, severe icing, and/or low-level wind shear will be issued, when required, on both a scheduled basis each hour at 55 minutes past the hour and on an unscheduled basis as a special report. These SIGMET alerts are valid for a one-hour period and will be distributed nationwide by FAA/NWS. Part A of the convective SIGMET, which is a brief description of the thunderstorm area in terms of NAVAID locations, will be relayed directly to inflight aircrews by the controllers rather than by telling the airborne crews to monitor a VOR broadcast.

NEAR MIDAIR

A Recce type, in his RF-4C, was flying along an IR in VFR conditions when he had a near midair with a light aircraft. During the investigation, it was discovered that the IR passed close to an uncontrolled airport that was not on the TPC (Tactical Pilotage Chart—scale 1:500,000′) that the crew was using. It did, however, appear on the Sectional with the same scale. Are the airports that could affect the military training route that you're flying depicted on the chart that you are using? It sure would be nice to know where to look for possible traffic.—Maj Joseph R. Yadouga, Directorate of Aerospace Safety.

STRUCK BY LIGHTNING

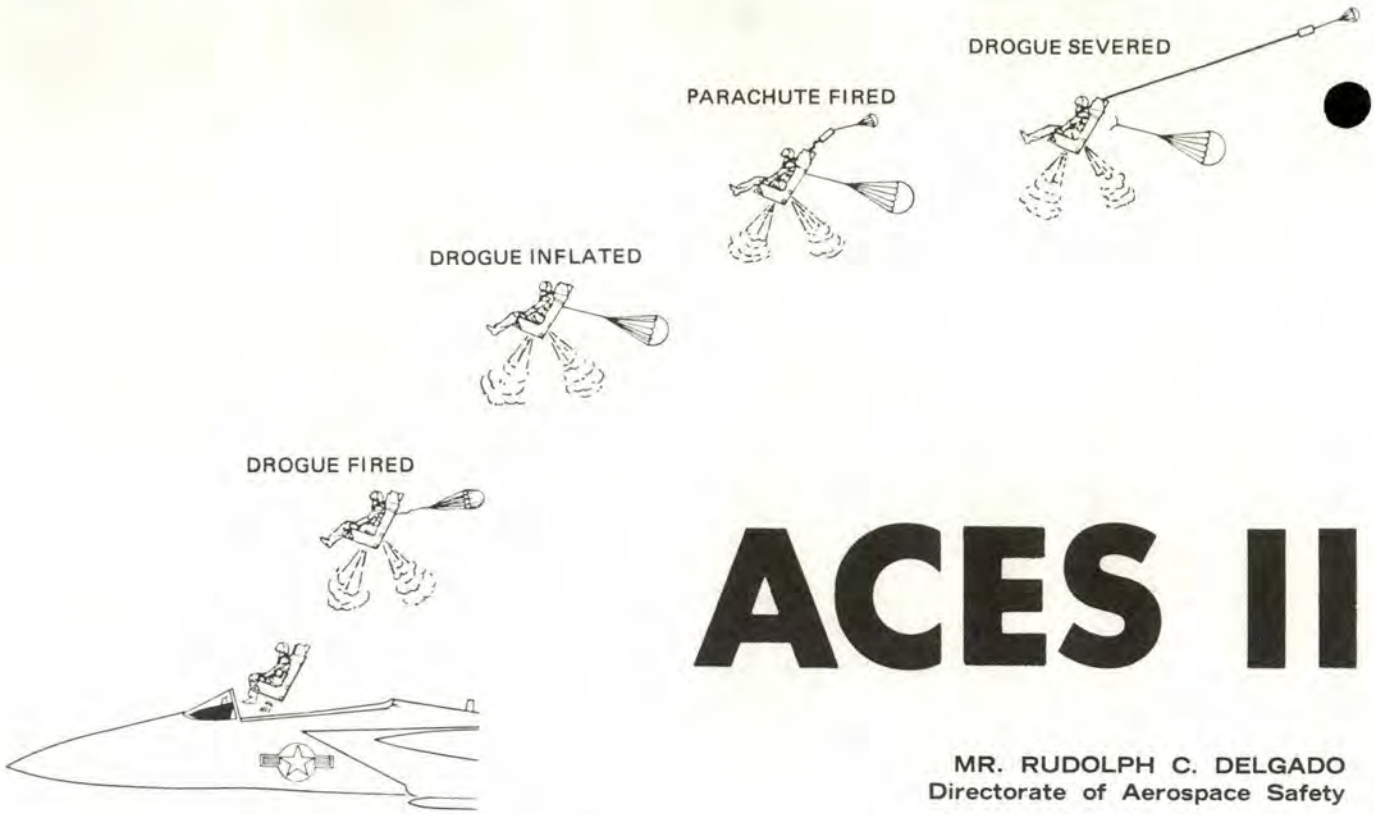
On climb-out while in a heavy rainshower at 15,000 MSL, an HC-130N crew saw a flash of lightning coming from their 12 o'clock position and felt a slight vibration on the floorboards of the aircraft. After the static discharge was noted, the crew checked radio, radar, and navigation equipment and found it to be operating correctly. Upon arrival at their destination, the aircraft was visually inspected for damage. The radome had pinholes. At no time during the flight did airborne or ground radar indicate that the aircraft was within 10 NM of thunderstorm cells. Aircraft was returned to home station where radome was removed and sent to depot for repair. (Lightning will getcha!)

MIN POWER ON GROUND!

A C-5 blew over some ground equipment while recovering at an overseas destination. Some distance and equipment problems were related, but this serves as a good reminder to watch that heavy throttle hand coming out of the chocks, arming areas or anywhere for that matter. Minimum taxi power is the watchword!

TAXI CRUNCH

They do it too! Extracted from a major air carrier's safety bulletin is the following:
"Taxiing onto gate, the aircraft struck an improperly positioned maintenance tractor. Because of other improperly positioned equipment, the mechanic's attention was diverted due to a clearance problem between a cargo loader and the left wing tip." What a waste! Check your ramps and hangars for obstacles one more time. ★



ACES II

MR. RUDOLPH C. DELGADO
Directorate of Aerospace Safety

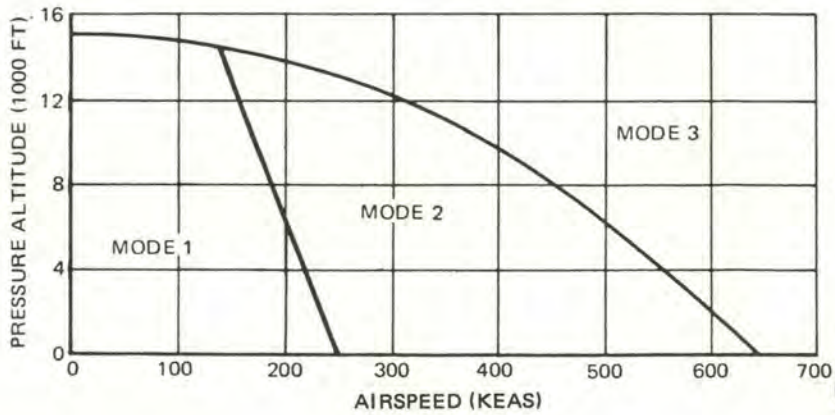
The Air Force's newest and best ejection seat, ACES II, is now operational. This article addresses some of its good points and discusses some of the features which have caused some misconceptions about it. It also provides some of its history. More detailed technical information should start to become available through the Life Support and Safety organizations of the units getting these seats.

ACES II, the advance concept ejection seat, is here. At times an elusive dream to those of us in the emergency escape business, it has at long last become a reality.

It had been in the making for over 11 years and there were times when it appeared as if it would never get here. But, it is indeed here now. Production A-10 aircraft number 102, delivered to the Air Force in April 1978, and production F-15 number 273, delivered in May 1978, were equipped with the ACES II. The F-16 was to have ACES II as the aircraft started coming off the production line in August 1978. A-10's and F-15's equipped with the interim ESCAPAC seats will be retrofitted with the ACES II starting in the fall of 1979 for the A-10 and the spring of 1979 for the F-15.

ACES II, called a high performance escape system, was developed by the Douglas Aircraft Company under contract to the United States Air Force. This increased performance capability enhances the survivability of aircrews during escape from aircraft under adverse conditions, throughout a large percentage of the aircraft's flight envelope. The seat is considered rugged, lightweight and easy to maintain. A sampling of its advanced technology subsystems include:

- Three operating modes to provide optimum performance over the complete 0 to 600 knots equivalent airspeed escape envelope.
- It uses a seat-installed sensing system for recovery mode selection.



MODE ENVELOPES

IS HERE

• It uses an electronic sequencer with redundant circuitry to provide optimum sequencing and timing for each mode.

• It uses a gyro-controlled vernier rocket to stabilize the seat/man combination in pitch at low speeds.

• It uses a hemisflow drogue parachute to stabilize and decelerate the seat/man combination at high speeds.

• The personnel parachute is deployed by a mortar for consistent operation.

• It has personnel parachute canopy reefing capability to permit high speed deployment without excessive onset of forces on the crewman.

• It has a single-point emergency ground egress release control.

All of the foregoing combine to make ACES II the best ejection seat the Air Force has ever had. In fact, if this seat works as advertised, it has the potential for actually improving the ejection survival rate by saving some of the crewmen who eject near the outer edge of the envelope in present systems. This, though, is provided that crewmen do not "compensate" for the ACES II's improved capability and decide that with this seat they have more time to recover a sick or departed aircraft. If this is the case, then this very large investment in safety will have been made in vain.

The stability engineered into this seat should also help reduce some of the flail injuries that unstable seats are capable of producing.

Another thing worth mentioning about ACES II is that its performance exceeds that of the military specification it was built to. This ranges from 29% in the minimum ejection altitude requirement for inverted attitude ejection at 150 KEAS (200 feet required versus 143 feet actual) to 350% for the 10,000 feet per minute sink at 150 knots level attitude capability (300 feet required versus 85 feet actual).

The ACES II rocket catapult is rated at 14 G's peak acceleration

AIRCRAFT ATTITUDE	VELOCITY (KNOTS)	ALTITUDE REQUIRED (FEET)	
		MIL-S-9479B	ACES II
0 DEG PITCH, 60 DEG ROLL	120	0	0
0 DEG PITCH, 180 DEG ROLL	150	200	143
0 DEG PITCH, 0 DEG ROLL 10,000 FPM SINK RATE	150	300	85
–60 DEG PITCH, 0 DEG ROLL	200	500	286
–30 DEG PITCH, 0 DEG ROLL	450	500	401
–60 DEG PITCH, 60 DEG ROLL	200	550	312
–45 DEG PITCH, 180 DEG ROLL	250	600	385

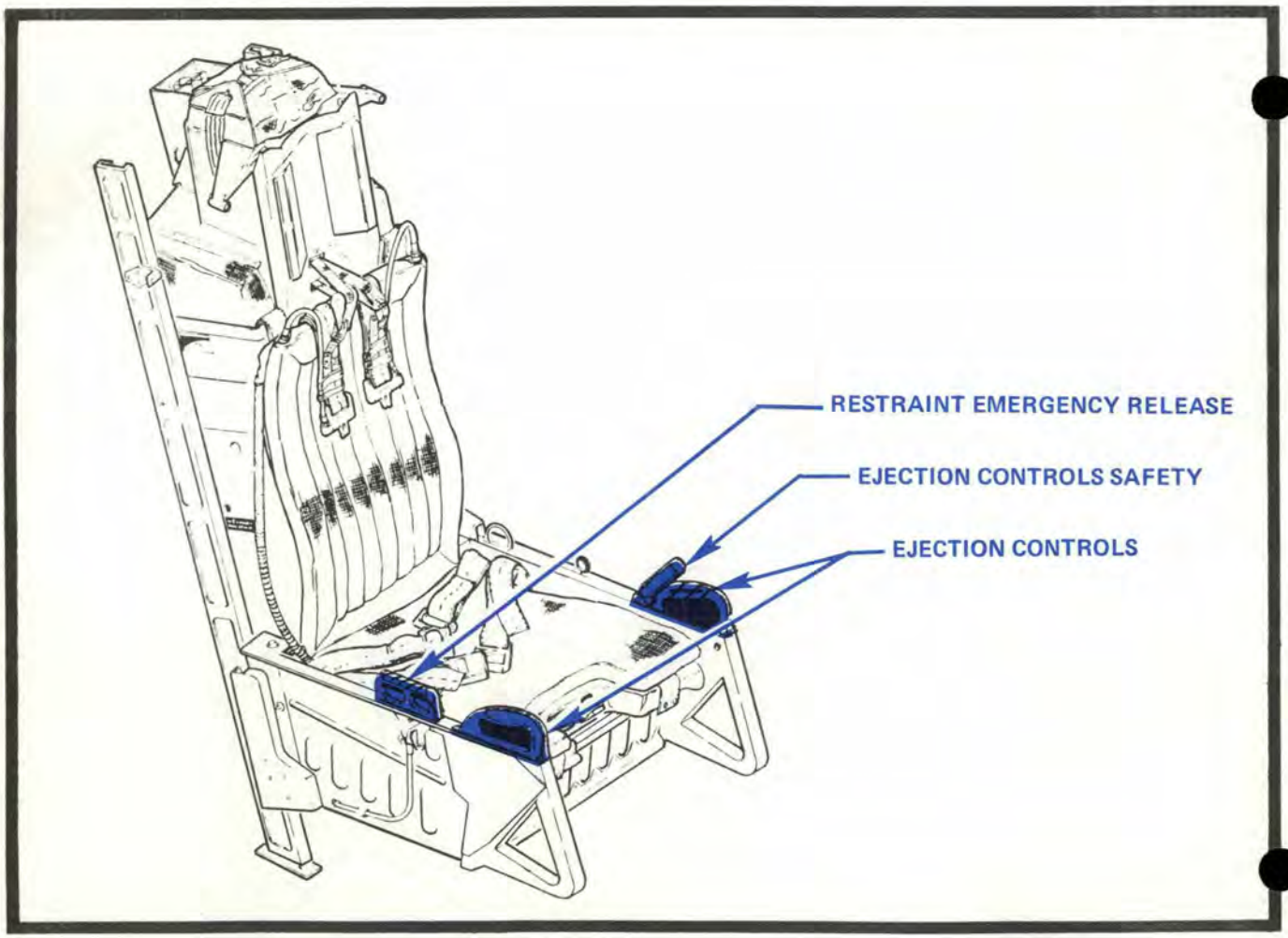
ACES II PERFORMANCE

ACES II IS HERE continued

with a nominal impulse of 1150 pounds-seconds. Average seat velocity at the end of the catapult stroke is 43 feet per second. This rocket has a lower impulse than some of our existing seats have. This should help reduce the vertebra compression fracture rate attributed to seat acceleration during ejection in present systems. This lower impulse is made possible by the entire system's rapidly programmed total operating time. This varies, depending on ejection conditions, from approximately 2 seconds for mode 1 (low speed, low altitude) to up to 6 seconds for mode 3 (high speed, high altitude). These times do not include canopy removal or seat sequencing (two-seat aircraft) timing.

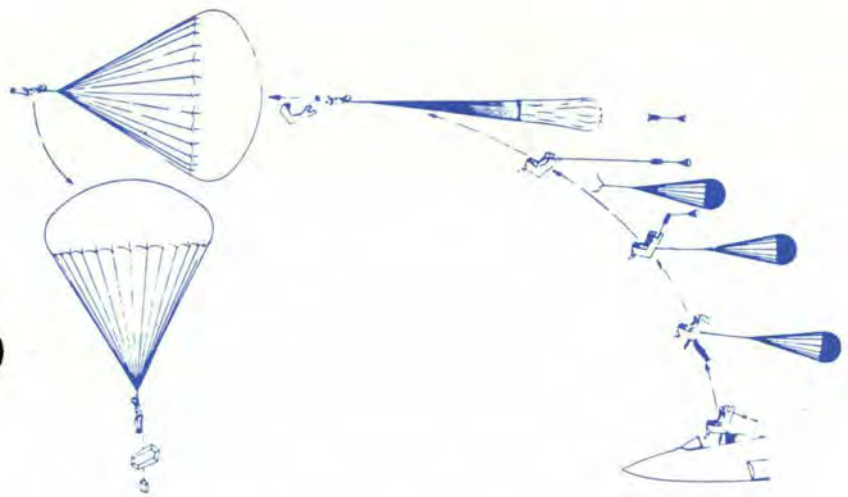
Some of the controversial characteristics of the ACES II involve the fact that it does not provide "bail-out" or over-the-side capability. That's right. You can only abandon the airborne aircraft by way of the seat. Lest you think the Air Force was crazy for buying such a seat, read on. The last successful bailout from a fighter type aircraft due to a seat malfunction occurred in May 1968. That means one bailout out of 2071 ejections over a 10-year period. So it would appear that the odds of ever needing this capability are pretty remote.

Another one of the controversies has to do with the fact the ACES was built primarily as a side-arm ejection initiated seat. The A-10 and F-15 seats will be side-arm initiated. The F-16 seat will be D-ring initiated because the side-arm initiation controls would have interfaced with the aircraft's side-arm controller and the throttle. Before you D-ring jocks mutiny, be aware

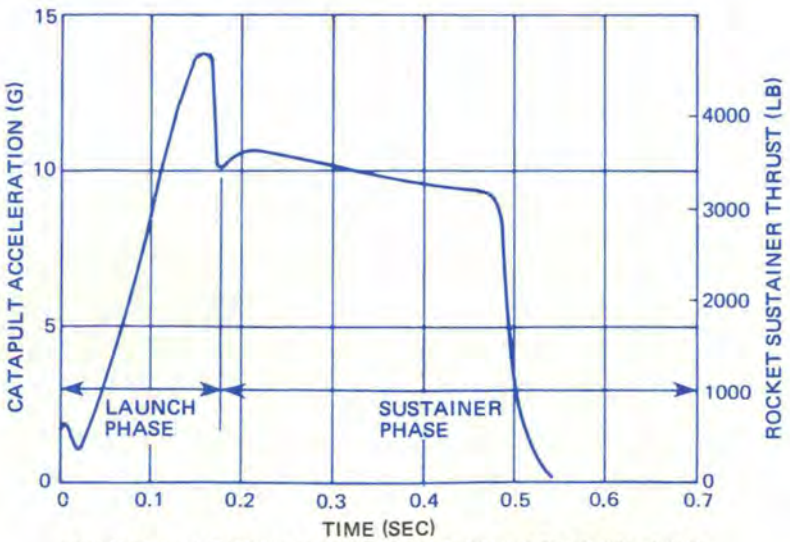


that injury data, laboratory/centrifuge testing, timing tests, and pull force tests all favor the side-arm seat over the D-ring. Besides, you can't get both full hands on a D-ring like you can on side-arms. This will better protect you against arm flailing.

The idea for ACES II started out many years ago when somebody decided that the Air Force ought to have a standard ejection seat that could be used on all newly developed aircraft. Heretofore, aircraft manufacturers had more or less a free hand on what seat they could put in their aircraft. In many cases, this meant using whatever was available and would fit. There were specifications but they apparently allowed a lot of leeway as to the seat used. Evidence of this can be seen in our older aircraft which have a proliferation of many types of seats. Most of these worked approximately the same but yet, they were quite different from each other.



MODE 2 OPERATION



TYPICAL ROCKET CATAPULT ACCELERATION AND ROCKET MOTOR THRUST VERSUS TIME CURVE

It was then decided the Air Force would develop a standard ejection seat encompassing the latest state-of-the-art in escape systems technology, which could be provided as government-furnished equipment (GFE) to manufacturers developing new aircraft. This task was assigned to AFSC's ASD/ASWL, the then newly chartered Life Support Systems Program Office (LS SPO). ASD/AEL, as it is now called, prepared a new specification, MIL-S-9479A, "Seat System, Upward Ejection, Aircraft General Specification for," which was approved in 1967. They then contracted Douglas Aircraft Company, now a subsidiary of the McDonnell-Douglas Corporation, to build a prototype of the seat which eventually became known as ACES II.

In closing, we'll just pass on a bit of advice. While ACES II is capable of saving you in a variety of circumstances ranging from 0 to 50,000 feet altitude and 0 to 600 KEAS, it is still advisable, whenever possible, to slow the aircraft to a moderate speed prior to ejection. This is because while the seat may be qualified to 600 knots, your body is probably not and you can still get hurt. ★

Arctic Shelters

MAJOR GILBERT C. BODRAK
3636th Combat Crew Training Wing (ATC)
Fairchild AFB WA

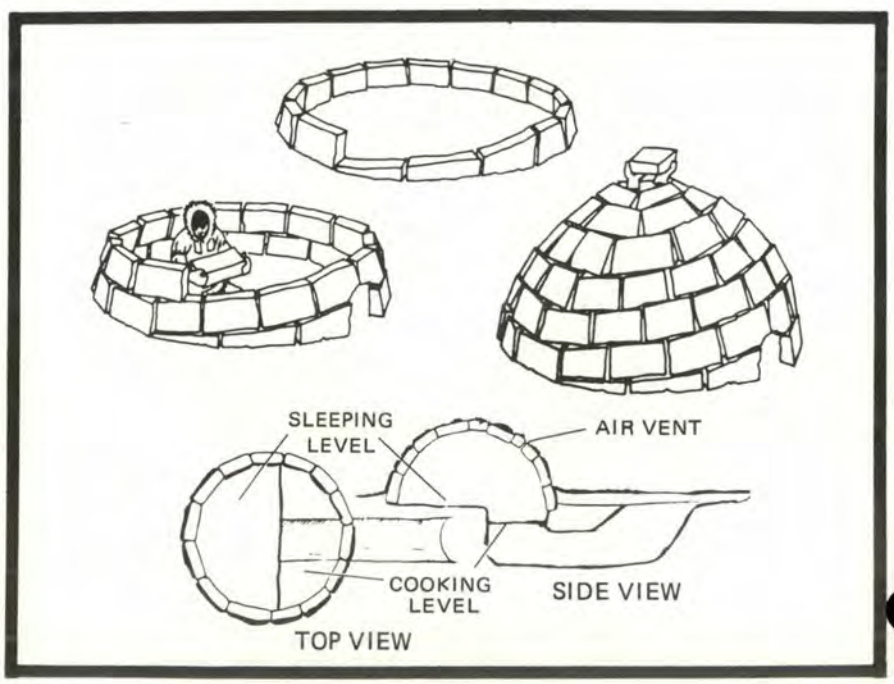
When the temperature in the Arctic reaches −30°, and the wind gusts to 20 knots, any exposed flesh may freeze within 30 seconds. Striking? Yes, but you can survive if you know beforehand what you are going to do. The first requirement will be proper clothing and first aid, if you are injured. The next step will be shelter.

Shelter in the Arctic can be a frightening thing, particularly if all that is available is snow. Generally, in North America and below the tree line of the Arctic, wood is the primary building material. Above the tree line, the only material is snow.

During the winter, that dreaded blanket of snow may well be the blanket for survival. Snow possesses excellent insulating qualities. As fresh snow falls, it forms countless minute pockets of insulating air. This insulating quality can ensure a shelter that is not only warm but quiet as well. Still, snow is not considered as being very hospitable, hence some mental adjustment may be called for.

In this article, we will consider snow shelters for use above the

Drawings below show details of building a snow block house.



tree line. Granted, shelters using wood frames are equally important, but space and time preclude covering both in one article.

SUITABLE SNOW

As the snow remains on the ground and is blown by the wind or packed by other forces, it goes through a process of change known as metamorphism. During this process, the sharp edges of the new snow disappear, and the snow forms tight kernels or globules. This makes the snow more dense; it traps the air more effectively, which makes it easier to work with when constructing such shelters as a trench, snow cave or blockhouse.

SNOW TRENCH

Perhaps the easiest and fastest shelter to construct is the snow trench. A trench can be constructed anywhere that sufficient hard-packed snow is found, but is normally considered to be a temporary shelter. If, however, your stay is longer than expected, it may be enlarged to a permanent one by simply adding rooms. To construct a basic snow trench, mark out a rectangle approximately 3 feet by 7 feet on the snow (these are minimum dimensions). Cut a half-moon wedge at the base of the 3-foot wide rectangle. This will make it easier to cut and extract your subsequent blocks. Cut the blocks approximately 8 inches wide and 18 inches deep. As the blocks are cut, remove them and place them along the side of the trench. Once the blocks are removed from the 3 x 7 foot area, cut another trench along each side, 6 inches deep and wide. This step will serve as your base when you start stacking the blocks to form the roof.

At the end of the trench, opposite the entrance, start placing the blocks to form an inverted "V." Offset the first two blocks in the 6 x 6 inch trench; this will facilitate handling the remaining blocks as each is stacked against the other one at a time. Join these blocks at the top by shaving off the corners to form a flat surface and fill in any cracks with soft snow. Now, cover the ends with blocks of snow and dig an entrance. (Shelters should be positioned so their entrances are 90 degrees to the prevailing wind.)

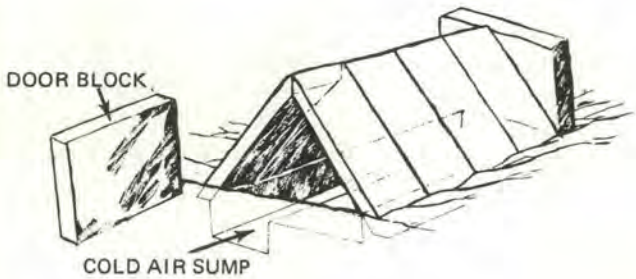
The trench has its drawbacks in that it is confining, but its design serves its purpose. For anyone in the market for more space, the recommended shelter is the snow cave.

SNOW CAVE

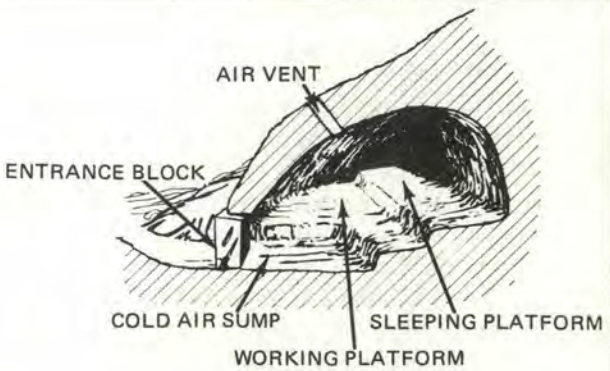
Though more effective, the snow cave requires not only more time but more snow. The ideal place to dig your cave is a large, wind-packed drift or anywhere that the snow has settled (metamorphosed). A common method for building a snow cave is to dig a tunnel and then enlarge it to form the main part of the shelter. Here is a helpful hint from Ernest Wilkinson in his article entitled "The Instant Cave."

Mr. Wilkinson selects snow of the slope or windblown drift and digs an entrance hole about 3 feet wide and 4 feet high. This is followed by carving out the cave without a great deal of stooping and kneeling. After removing the bulk of the snow from the cave, Mr. Wilkinson shapes the ceiling and walls into a dome placing the snow at the sides where it will be packed into sleeping benches a foot to 18 inches high. Next, a trench is dug downward toward the cave entrance.

Outside the cave, snow blocks are cut and laid forming a wall in the entrance. The wall comes up under the snow cave roof (not outside it) giving greater support to the cave. When the snow has



FIGHTER TRENCH



SNOW CAVE

hardened, a small entrance hole is cut in the bottom of the wall. By now the sleeping benches have hardened, and the cave is ready for occupancy. Is it?

With any type of snow shelter, ventilation is a must. Cut a hole (or poke it with a ski pole or handle of a shovel), preferably 45 degrees above the cooking area. If you expect snow during the night or think the vent might freeze over, leave a ski pole or shovel handle in the vent. During the night, jiggle the pole up and down effectively clearing the air passages. Secondly, poke another vent hole in the block covering the entrance to your cave. This will allow proper ventilation through your cave, alleviating stale air and the possibility of carbon monoxide poisoning.

Regardless of how cold it may get outside the snow cave, the temperature inside will be quite comfortable, and you will be protected from the wind. Ideally try to keep the inside temperature at +32 degrees or lower. This will ensure proper support for the dome and will avoid massive amounts of dripping water.

After a day-or-two of living in the cave, an icy glaze may appear on the interior surface. Scrape it off so the snow can "breathe." This will help to avoid the stale, stuffy air so common to the snow cave. Do not be alarmed after this period of time that the roof has settled. It does not mean that a cave-in is imminent. Simply shave off one or two inches of the dome to preserve your head room.

If you find that the walls are dripping excessively, it normally means that the roof is too thick. Shave some off. Conversely, if they frost over, the roof is to thin. Go outside and shovel more snow on the top of the cave.

Water is always a problem. Any outcropping of snow in the wall or dome will collect water and drip. You can avoid these outcroppings by making the walls and dome as smooth as possible. As in any phase of Arctic survival, the secret is to stay dry. Always dress for the occasion. During construction of the shelter, wear lighter garments to avoid heavy perspiration which will freeze inside your clothing, thus decreasing effective insulation. While in the shelter, dig a drain trench around the cave edge to collect the water as it drains off the dome and walls. Keep your sleeping bag covered when not in use. Should your bag or clothing become wet, store it in the entryway or on the floor away from any source of heat. Once ice has formed, it may be scraped off with a knife or beaten out with a stick.

THERMAL HEATING

During construction of the aforementioned shelters, dig the floor to ground level if at all possible. This will supply a constant source of heat from the ground. In a permafrost area, the ground temperature will average +18 degrees Fahrenheit regardless of what the temperature may be outside the shelter. Eighteen degrees then will be the minimum temperature, which will rise progressively higher as body heat or heat from candles, sterno or cook stoves is introduced.

HELPFUL HINTS FOR SHELTER LIVING

1. With either the snow trench or the cave, it is important to remember a few basic facts about shelter living. Take all your equipment inside the shelter when you retire for the night, particularly your shovel. Wind and snow may make it necessary to dig your way out in the morning.

2. Once inside, organize and store your gear. Keep everything in its place. Shelters have been known to virtually "gobble up" cups, spoons, candles, etc. Tie small items (knives, mittens, compass, etc.) to your body or clothing. Stay organized.

3. Never sleep directly on the ground or snow. Always place something under your sleeping bag (ferns, dry moss, boughs, waterproof pad or several layers of parachute material).

4. Keep your sleeping bag clean, dry and fluffed up to give a maximum loft of dead air space. To dry the bag, turn it inside out and beat out any frost.

5. Don't let candles or sterno cans burn through the night. They are not necessary as you will receive ample heat while in your sleeping bag, and they will further deplete the amount of available oxygen in the cave.

6. If you plan on any travel, be sure the shelter is well marked. Parachute material on a willow whip would be ideal. Snow drifts can all look alike in a short period of time and from a surprisingly short distance away.

In summary then, remember that a snow shelter will protect you from that temperature and wind that will freeze exposed skin in 30 seconds. With a little mental adjustment and prior planning, it can and will provide you a home of ample warmth. That dreaded blanket of snow can definitely be your blanket for survival. ★

Dr. Strangepilot

...Or, How Rippy Learned To Stop Worrying and Love.... Proficiency Flying

SQN LDR PETER WHITE, RAAF
Directorate of Aerospace Safety

The day hadn't started at all well for Capt Rippy Proflier. He'd been dubious about accepting the Saturday alert in the first place, and the zero-dark-thirty telephone call from the command post had merely confirmed that it was a rotten decision. It wouldn't have been too bad if he'd just managed to hit the books the night before, the way he'd planned to, before the boss had him work late at the office. By the time he'd arrived home, sunk a beer, and eaten dinner, he was just too pooped to drag out the manuals. Still, the squadron had said that alerts were pretty quiet lately, and he'd intended to get a couple of hours of review in the next day. Well, the early get up had fixed that.

The cold, gloomy 40-minute drive through the pre-dawn mist and fog hadn't contributed to his mental outlook, either. Why couldn't the general have jumped an airliner, and left him to his bed?

At Base Ops he had been confronted with, firstly, an FCIF considerably more bulky than last time he'd looked at it (was it *really* 30 days?), and secondly, Captain Nupuke, his copilot for the mission, who, it turned out, had all of 25 hours on the beast, this being only his second CP ride since checkout. As well as ploughing through the FCIF, and mastering the paperwork of flight planning, weather, command post and all the rest of the stuff, he had to hand-lead his offsider through most of the TOLD card. What did they teach these guys in conversion training nowadays? To top it all off, he'd forgotten his winterweight flight jacket, and destination was forecast cold enough to freeze the balls off a pawnshop sign.

If he'd had time to think of it, he probably could have predicted that, about that time, the telephone would ring, as it did, to announce that the general had arrived 45 minutes early, and was, quote, rarin' to go, unquote. The subsequent rush to file the plan, call fleet ser-

Dr. Stangepilot continued

vice, organize the crew bus, and hustle his copilot with the flight bag left him feeling pooped even before he got to the aircraft.

The period before takeoff had been like one of those nightmares where, run as he might, he couldn't get anywhere. He managed to preflight the interior, load the baggage, brief the pax in quick time—only to spend the next 5 minutes cooling his heels as the copilot completed his slow, deliberate exterior check. Then, after they'd reopened the entrance door to load the coffee and water, sorted out the dispatcher's queries on their flight plan, and held for 10 minutes while their clearance caught up with them (how could he have forgotten to put it on request as he strapped in?), he'd managed to get airborne.

From that point, he recalled, the trip just tilted more steeply downhill. It just wouldn't have been in context if they hadn't encountered 40 knots more headwind, and cirrus higher than they could climb, and the continual turbulence which soon had some of his pax looking extremely out of sorts.

By that time, the news from Metro that the front which originally wasn't expected until well after they'd come and gone, would now be awaiting him at his destination, didn't come as any surprise at all. He thought he'd done a good job of briefing the approach, and the wet runway landing, and what he expected from his neophyte cohort in the right seat. He'd just about caught up with things as they started down out of 390. The half dozen attempts to get hold of dispatch on the way down had been quickly relegated to the status of routine irritant. Even the rain and icing, just as they hit the final approach fix, hadn't distracted him too much. If that Approach turkey had given him a better cut at the fix, he'd have had it all wired. Still, that's why they'd put the speedbrake there.

The ILS wasn't as good as it could have been, thanks to the crosswind. When they broke out a couple of hundred feet above minimums, he'd maneuvered across to regain the centerline and set himself up for the min run landing. He'd even adjusted his final approach speed to account for the gusty conditions.

Even now, some little time later, he was still a bit hazy about all the details from there. He'd managed to get the little Sabreliner over the threshold in pretty good shape, when suddenly the aircraft buffeted and rolled sharply right. He'd picked the wing up with full aileron and added power, just as the runway came up with a dreadful rush and stopped their precipitous descent with a bone rattling thump. As he fought to keep it straight, he felt the aircraft lurch just before it started to drift left. He'd kept it somewhat under control until 60 knots, when it veered sharply left again and nosedived into the snowbank beside the runway.

Well, he'd managed to get the passengers out of the overwing escape hatch in reasonable order, and it hadn't been hard to figure out that the combination of a blown left tire and his not engaging nosewheel steering had caused the aircraft to depart the runway. But, he was still a bit puzzled about why the aircraft had rolled so sharply on short final. And, the way the passengers were now acting on the ride in to Base Ops, you'd think it was *his* fault that the general had slipped on the ice-covered right slat as he exited and tore the seat out of his trousers!

* * * *

The problems that proficiency flyers face in staying current are well known, and those of us who combine large steel desk (LSD) flying with the other kind have all experienced the pressures (hopeful

not all at once!) that our hero had to face. Mostly, we manage to overcome all these and worse, and complete the mission. We all know that Rippy would have had a better chance of keeping himself out from behind the 8-ball if he'd:

- Established a regular manuals review program.
- Flown at consistent intervals.
- Managed an occasional local trainer (preferably with an IP).
- Made more use of the trainer/simulator program (there's a sign on the wall of the trainer room at my base which says it all: "Better to be down here wishing you were up there, than up there wishing you were down here.").
- Not allowed himself to be rushed through the preflight phase (hard when the DV shows up early, isn't it?).
- Planned ahead a bit more on how the new conditions at destination would affect his operation. (Sure, he remembered the min run landing, and the gusty wind conditions, but completely forgot the effect that an iced up slat on one side would have on his aircraft's performance; and didn't check it. Such details can ruin your whole day, not to mention the general's pants.)

The following list of questions as originally published some years ago, but its validity to today's proficiency flyer, and indeed to all flyers, remains unchanged. It was originally devised by the then Major Laree D. Chetelot, AFSC, and published in AFSC *Professional Approach*.

1. Do I wait until the last minute to notify scheduling when I am unable to keep a flying commitment?
2. Do I continually turn down weekend and night flights because of other commitments?
3. Do I show up at Base Operations so late that there isn't time for adequate flight planning before takeoff?
4. Do I study aircraft systems and procedures only before a flight check?
5. Do I wait until the last part of the 6-month period to complete a proportionate share of flying hour requirements?
6. Do I expect a flight examiner to tell me during the flight check what I already should know?
7. Do I ignore letters or scheduling forms when a reply is requested?
8. Am I frequently "too busy" to return a phone call to flight operations?
9. Do I frequently cancel or reschedule training flights?
10. Do I feel that my responsibilities in the office are so pressing and important that I can't afford 2 or 3 days away on an extended flying mission?
11. Do I neglect to keep myself current on flying publications, regulations, technical orders, and changes thereto?
12. Do I spend so little time practicing emergency bold face items that my reactions are questionable when the situation develops?
13. Do I feel slightly apprehensive strapping into the pilot's seat because I haven't flown for 30 days or more?
14. Do I consider my office duties so pressing that I don't have time to attend flying safety or aircrew meetings?
15. Do I feel that I have not given the flying job my complete support because that is not where my OER is written?
16. Do I tend to rely heavily on the other pilot to handle unusual circumstances instead of being personally on top of all situations?

I submit that even a single "yes" answer to any of these questions is grounds for self-examination.

By the way, you'll be pleased to know that a month after his little adventure Rippy was Qual Level 1 on "No's"! Don't wait for a sparring session with a snowbank before you can say the same. ★

Above—Reserve C-130 crew maintaining proficiency on air drop missions. Left—The AF Reserve supports MAC in air rescue missions. Below—Reserve technicians loading weapons on one of assigned Reserve aircraft.

Maj Gen Richard Bodycombe, Vice Commander of AFRES, Right, and Maj Gen William Lyon, Commander, Air Force Reserve, Left, holding the Major General Benjamin D. Foulois Memorial Award trophy.

AFRES WINS FOULOIS TROPHY

LT COL TED OGLESBY
Mobilization Augmentee AFRES

The Air Force Reserve has won the coveted Foulois Trophy for operating the best flight safety program in the Air Force during 1977.

The trophy, named in honor of Major General Benjamin Foulois, an early Chief of the Air Corps, is presented during the annual convention of the Order of Daedalians. Major General William Lyon, Commander of AFRES, accepted it in San Antonio, Texas, 3 June 1978. It was the first time AFRES had won the award.

AFRES aircraft flew more than 143,000 hours with only five recordable accidents during 1977. More than 43,000 of the hours were in fighters. Three of the recordable accidents were of the minor variety with damage less than $50,000 while the other two resulted in destroyed aircraft. There was no loss of life.

In one instance, where an aircraft was destroyed, the reserve pilot won the Koren Kolligian Trophy for the best feat of airmanship in the Air Force in saving lives and property.

A C-123, piloted out of Westover AFB, Massachusetts, in October 1977 by Major Gale French, had an inflight engine fire. Maj French piloted it safely to the runway saving all lives aboard though the aircraft was destroyed.

The other destroyed aircraft was an F-105 which had engine failure. The pilot successfully ejected.

The loss of both aircraft could be attributed, at least in part, to the age of the aircraft, according to Lt Col Thomas A. Duke, AFRES Director of Safety.

The Air Force Reserve, Col Duke pointed out, operates under such unique circumstances that the winning of the Foulois Trophy becomes even more significant and meaningful.

- AFRES, with the Air National Guard, has the oldest hardware of any of the flying commands. Though some reserve crews fly in associate units with active duty counterparts in the most modern aircraft, most units have the older equipment.

- AFRES has more weapon systems than the other commands. Its units are gained in time of mobilization by four different commands (MAC, TAC, SAC and ADCOM).

- The aircraft inventory includes the C-5, C-9 and C-141 flown by the associate units and the A-37, C-7, C-123, C-130, AC-130, KC-135, EC-121, HH-1, HH-3, CH-3 and F-105 flown by other reserve units.

With more weapons systems, there are more diverse interests to be melded into the command-wide flying safety program. Missions include the routine and the emergency. There are, of course, the routine training flights. More often, these are productive cargo-carrying missions that otherwise would have been flown by active duty personnel. Not at all unusual are the emergency relief missions where flying conditions are frequently more dangerous.

Gen Lyon illustrated the diversity of the missions by pointing out that many reserve aircraft supported Red Flag exercises. Additionally, C-130's flew rotational South American routes from Panama, F-105's deployed to Europe, and we activated our KC-135 refueling mission and participated in Exercise Bold Eagle. We provided much of the airlift support in year-long disaster relief and airborne fire-fighting operations." Reserve crews helped with the Buffalo (NY) snow relief and California fire-fighting efforts.

Safety officers also are concerned with training reservists who are on board only a few days at a time.

Col Duke attributed the first-ever accomplishment in part to AFRES developing its own flying safety program instead of trying to follow all the diverse programs of the various gaining commands. "We consolidated the appropriate elements from TAC, MAC and SAC programs and incorporated the best and the appropriate features into our own program," he explained. "All our safety people have to be instructors too."

"Another factor in achieving the record," he said, "is a more realistic training program than before. We now fly like we would actually fight. This is a morale builder. We

AFRES WINS FOULOIS TROPHY continued

try to do something the active force does and find we are quite good at it. The resulting high morale is a super plus for the safety program."

He said, "There is tremendous support from the other staff agencies. A lot has to be crammed into the weekend training assemblies, and it requires close coordination, efficient scheduling and sacrificial cooperation, all made possible by relentless command emphasis."

All these factors—particularly the age of the aircraft and the shortness of available time—combine to require unusual initiative at the lowest field level to get the job done.

Though this is the first time in history AFRES has won the trophy for the best command-wide flying safety program, flying safety is habitual to a number of individual units which have 20 or more years without a chargeable aircraft accident.

Heading the list is the 64th Tactical Airlift Squadron at Chicago's O'Hare which hasn't had an accident since its activation more than 31 years ago on 5 April 1947.

Three more units also never have had a chargeable accident since they were activated at least a quarter-century ago. They are the 327th TAS at Willow Grove, 355th TAS at Rickenbacker, and the 303rd TAS at Richards-Gebaur.

The remaining five have had no accidents in the last 20 years or since they were activated. They are the 704th TAS at Bergstrom, the 96th TAS at Minnesota-St. Paul, the 731st TAS at Westover, the 305th ARRS at Selfridge and the 336th AREFS at March.

The year 1977 saw more laurels added to the flying safety records of various units. Reaching the 75,000 hour of no-accident flying was the 940th AREFG at Mather. The 924th TAG at Bergstrom reached the 50,000 hour plateau. Reaching the 25,000 hour mark were the 68th TAS at Kelly and the 908th TAG at Maxwell.

Five of the 50 flight safety plaques presented Air Force-wide went to reserve units. They were the 919th SOS, Eglin AFB; the 304th ARRS, Portland; the 302d SOS, Luke AFB; the 301st TFW, Carswell AFB, and the 433rd TAW at Kelly AFB.

Col Duke worries that winning the award might make reserve fliers more complacent. "The Foulois Award hasn't been won in consecutive years since 1952, more than a quarter-century ago," he said. "It is easy to become complacent, and that's when accidents happen."

AFRES doesn't intend to become complacent, however. Not only does it intend to repeat the win in 1978, but it has been challenged to improve safety performance in the industrial areas as well and win the Secretary of the Air Force Award for the best overall safety program in the total force.

Maj Gen Richard Bodycombe, Vice Commander of AFRES, said, "An improved flying safety performance and a reduction of civilian injuries of at least 40 percent is the AFRES goal for 1978." ★

Lower L, a flight of F-105s, one of three tactical aircraft assigned to AFRES. Right—The Reserve own and operate HC-130s with refueling capabilities.

NEWS FOR CREWS

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

CAPTAIN ROBERT ZEINER
Air Force Manpower and Personnel Center

Many officers who visit or call AFMPC have similar questions and concerns in most career management areas. This article addresses some of the most frequently asked questions.

QUESTION: I've been on station for 3 years. When can I expect an assignment?

ANSWER: Except for the maximum tours specified in AFR 36-20 (Air Staff, OJCE, overseas tours, etc.), AFMPC will not reassign an officer solely because a given time-on-station (TOS) has elapsed. The fact is, you could stay at your present base well beyond 3 years—until a requirement arises to generate a PCS for you. High TOS is still an important consideration. When all other pertinent factors are equal, the officer with the longest TOS will be selected to fill a requirement.

QUESTION: Can I move before I complete 3 years TOS?

ANSWER: On 1 May 1978, AFMPC implemented policies designed to comply with DOD guidance requiring 3 years TOS before CONUS-to-CONUS PCS moves are allowed. The authorized exceptions permitting PCS prior to 3 years TOS are:

1. Shorter tours listed in AFR 36-20 (such as ASTRA, USAF IG duty inspectors, certain departmental and joint tours, etc.).
2. Students attending PCS schools.
3. Assignments to overseas area (2 years TOS required).

The 3 year TOS requirement is an important part of the Air Force plan to reduce PCS turbulence and conserve PCS funds. Longer time on station will offer you some excellent opportunities. Setting up a program to finish your degree or to pursue an advanced degree will be easier. The option of completing advanced PME via on-base seminar will be much more attractive with increased PCS stability.

QUESTION: Do all rated jobs include flying?

ANSWER: No. Many (in fact, over 3700) Air Force staff positions require a rated officer, but do not include mandatory cockpit duties. These positions usually carry 14XX or 22XX AFSC's.

QUESTION: I just finished my master's degree. Who do I call at AFMPC to get it on my records?

ANSWER: All academic information is now entered into the Advanced Personnel Data System (the computer) by AFIT at Wright Patterson AFB. The place to start is your Base Education Office. They can get the right information to the right people in minimum time. The Base CBPO (officer records) can check to verify that your records were updated correctly.

QUESTION: Can I visit AFMPC to check my records on a Saturday?

ANSWER: Yes. If you call the AFMPC Records Review Section at AUTOVON 487-2996 during normal duty hours, they will leave your records with the AFMPC Staff Duty Officer for viewing upon your arrival. Career counseling with a resource manager will normally not be available.

By the way, if you are planning to fly in, don't forget to check the IFR Supp. Randolph has some pretty exotic PPR and operating restrictions.

QUESTION: What assignments will be available for me 6, 9, or 12 months in the future?

ANSWER: This question is a difficult one to answer. The assignments that will be available in the future depend on many factors, not all of which may be known at the time of your question. For example, if you want to be assigned to a MAJCOM plans shop next summer, we may look at our manning documents and show no projected vacancies. However, officers presently in that organization may be reassigned PCS, retire, or separate—creating vacancies that were unknown when we were talking to you. Also program changes, authori-

zation increases and deletions, and changes in management emphasis will certainly influence what is "available" for you in the future. Also, many positions are "nominative" in nature, and require acceptance by the gaining organization before they become truly "available" to you. The best we can do in some instances is counsel you on the general areas and types of duty for which you are qualified. Pinning it down to a specific agency, division, desk, or particular aircraft cockpit can be very difficult (if not impossible) when talking beyond 4 to 6 months in the future.

NEWS FOR CREWS is written by the AFMPC Rated Officer Career Management Branch. If you have a question you would like answered in this column, send it to:

NEWS FOR CREWS
AFMPC/MPCROR
Randolph AFB, TX 78148 ★

MAIL CALL

CLASS RING

Your publication continues to highlight salient aspects of flight safety—good show!

I did note on page 12 (April 1978, **Aerospace Safety** magazine) the C-141 pilot cruising at X7600 feet indicated is wearing his class ring—very fitting for an article on complacency. It must be time to run your "missing ringfinger" photos again. Fingers departing hands make a nasty popping sound and can ruin your whole day. For the married troops, if your bride thinks rings come off when the gear comes up for nefarious reasons, assure her she's wrong —they come off before flight so they don't come off forever.

ROBERT A MANNS, Lt Col, USAF
Life Support System Manager
San Antonio Air Logistics Center
Kelly Air Force Base, Texas

CLASS RING II

You folks put out a lot of good information for the jocks in the field, however, the picture which accompanied the article, "The Automatic Complacency," April 78, also pointed out a degree of complacency on the part of the intrepid aviator in the left seat. He was wearing a ring on his right hand which is in violation of AFR 127-101 para 88-4g(2). This would have gone unnoticed, of course, had the pilot been wearing his nomex flying gloves. I'm sure this was just an oversight, keep up the good work.

RANDOLPH F. LEBER, Capt, USAF
Chief, Quality Control
552d Airborne Warning and Control Wing
Tinker AFB OK

MINIMUM FUEL, EMERGENCY FUEL, OR EMERGENCY?

MAJOR JOSEPH R. YADOUGA
Directorate of Aerospace Safety

When is the last time you declared "Min fuel," "Emergency fuel," or a fuel-related emergency? What did you mean, and what did you expect air traffic control (ATC) to do for you? What situation does the following definition refer to? "_____fuel" indicates recognition by the pilot that his fuel supply has reached a state where, upon reaching destination, he cannot accept any undue delay. If you said "Min fuel," you're right. "Min fuel" is not an emergency situation but merely an advisory that indicates an emergency situation is possible should any undue delay occur.

The above definition and explanation are taken from FAA Handbook 7110.65, *Air Traffic Control*. It goes on to say that common sense and good judgment will determine the extent of special handling to be given in such situations.

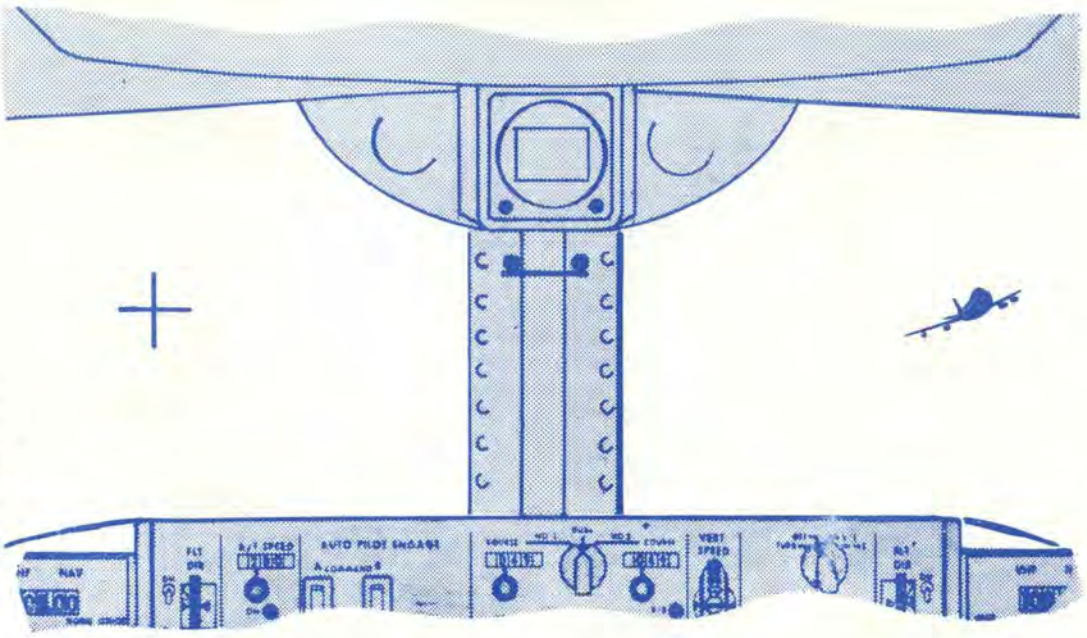
What does this mean to me as a pilot? It means that I should not expect any priority from ATC if I declare "Minimum fuel." If my fuel state is so critical that I can't afford any routine delays, then I have no choice but to declare an emergency. That can be done by declaring "Emergency fuel" or by declaring an "emergency" and telling the controlling agency the nature of my emergency—insufficient fuel supply.

Once an emergency is declared, ATC will "provide maximum assistance to aircraft in distress." FAAH 7110.65 further tells the controller, "Obtain enough information to handle the emergency intelligently. Base your decision as to what type of assistance is needed on information and requests received from the pilot, because he is authorized by FAR 91 to determine a course of action."

To summarize, if you have a fuel problem that requires priority or special handling from ATC, declare an emergency. Don't try to beat the system by declaring "Min fuel" and hoping to get down without any problems. ★

NOW YOU SEE IT . . .

Now You Don't



In aviation today, in spite of sophisticated air traffic control and navigation systems, the see-and-avoid concept is still a most important element in collision avoidance. To make the most of this concept, we should know our sight limitations. One little known limitation of the human eyeball is the blind spot where light strikes the optic nerve. In most eyeballs this blind spot is about 30 degrees right of center, looking straight ahead. With both eyes open and vision unobstructed by objects, the blind spots of each eye are cancelled by the peripheral vision of the opposite eye. The brain combines the image and the blind spot disappears.

But what happens when peripheral vision from the opposite eye is obstructed by an object such as a windshield centerpost? Now the brain cannot fill in the image. How large is the void? It's about a one-and-a-half degree cone diverging from the optic nerve. Under some conditions it could block instruments from view and will blank out a 707 one mile away. A 747 will disappear at a mile and a half.

You can find your blind spot on the picture above. Hold the picture at arms length with both eyes open, focusing on the cross on the left windshield. Then bring the picture in until it is almost touching your face. With both eyes open you should not lose sight of the 747 in the right windshield. Now close your left eye and try it again. Keep your right eye focused on the cross as you bring the picture in toward your face. The 747 will disappear, then reappear as you draw the picture closer.

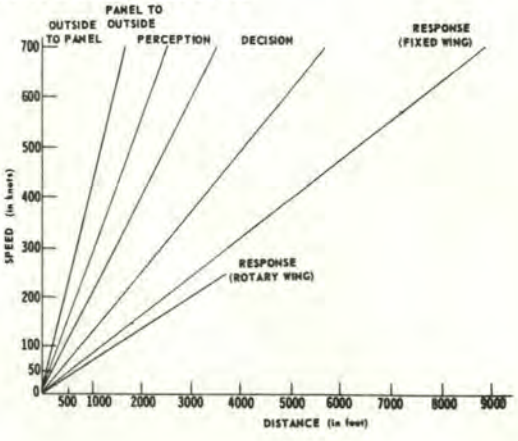
When your blind spot limitation is combined with empty field myopia (the tendency of the eye to focus at about 3-4 feet when there is nothing to focus on), you can really appreciate your visual limitations under the best CAVU conditions.

If you have ever grumbled about slowing below 250 knots in terminal areas, the charts below may alter your perspective. They were developed by the University of Southern California Safety Center for an SST collision avoidance project. Pilots were assumed to have normal 20/20 vision and average reaction time. (Crosscheck) ★

Minimum time and distance to avoid a fixed object.

	OPERATION	TIME (In seconds) ITEM	TOTAL
OUTSIDE TO PANEL VIEWING	1. Muscle movement	0.175	0.175
	2. Eye movement	0.05	0.225
	3. Foveal perception	0.07	0.295
	4. Accommodation	0.50	0.795
	5. Recognition of instrument reading	0.80	1.595
PANEL TO OUTSIDE VIEWING	6. Reaction time	0.175	1.770
	7. Eye movement	0.05	1.820
	8. Relaxation of accommodation	0.50	2.320
	9. Foveal perception	0.07	2.39
PERCEPTION	10. Sensation (retina to brain)	0.1	2.49
	11. Motor reaction (prearrange eye movement)	0.175	2.67
	12. Eye movement	0.05	2.72
	13. Focus fovea	0.07	2.79
	14. Minimum recognition	0.65	3.44
DECISION	15. Decision (est. minimum)	2.0	5.44
RESPONSE	16. Operating controls	0.40	5.84
	17. 50-foot vertical clearance	1.73[a] 2.73[b]	7.57 8.57

a = fixed wing b = rotary wing



CAPTAIN

Edward P. Rosenthal

MAJOR

Timothy G. Scofield

20th Tactical Fighter Wing

On 9 December 1977, Captain Rosenthal, aircraft commander, and Major Scofield, weapon system officer, were flying in an F-111E aircraft as number two in a two-ship formation flight. The flight had descended to 3,000 feet AGL in an attempt to enter low level, but due to low clouds they were unable to continue, and a climbout was begun. As Captain Rosenthal advanced the throttles to military and began climbing, there was a loud thump accompanied by airframe vibrations and a significant left yaw. They first observed the right engine rpm was decreasing and assumed the right engine had compressor stalled. As the throttle was retarded toward idle, Captain Rosenthal saw that the left engine had also rolled back, and the left rpm was stable at idle. The right throttle was returned to a military setting, but both engines remained at idle rpm. The airstart button was depressed to ensure auto ignition in case the engines flamed out. As the button was pressed, the right engine recovered. During recovery attempts, the aircraft lost 700 to 800 feet and 100 knots of airspeed. While being vectored toward the nearest landing field, Major Scofield started checklist procedures for recovering the left engine. The engine was shut down and restarted, but the throttle could not be advanced above 70 percent without loud engine rumbling and airframe vibrations. Captain Rosenthal and Major Scofield decided to leave the left engine at idle to furnish hydraulic pressure in case of another problem involving the right engine, and continued their approach using single engine landing procedures into a strange field with a 700-foot ceiling and 1.5 miles visibility. The elapsed time from the dual stalls until the aircraft was safely landed was less than 10 minutes. Inspection revealed that a fiberglass intake panel in the left intake had debonded and been ingested by the left engine. The sudden loss of thrust from the left engine had caused the yaw, and this yaw induced the right engine rollback. If not for the timely and proper actions taken by Captain Rosenthal and Major Scofield, this compound emergency in marginal weather conditions could have resulted in the loss of a valuable aircraft. WELL DONE! ★

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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 **Alvin G. Green**

CAPTAIN **Peter V. Voorhees**

704th Tactical Air Support Squadron

On 3 January 1978, Captains Green and Voorhees were flying in an OV-10A, the second aircraft in a flight of four, on a local training mission. The flight had conducted rocket qualification and were returning to home base for a night termination landing. Due to severe weather conditions at the home field, the flight had to divert to another base for recovery. Upon arrival at the alternate airfield, the flight separated for individual approaches and landings. On an 8-mile final, and over a densely populated area at 1,500 feet AGL, the left engine failed without warning. Approximately 15 seconds later, the right engine also flamed out. Captain Green and Voorhees evaluated the emergency situation and decided there was sufficient time to make one airstart attempt, while clearing the populated area, before ejection became necessary. Captain Green initiated airstart procedures on both engines simultaneously, while Captain Voorhees closely monitored and compared the engine instruments and the aircraft attitude and altitude. Successful restarts on both engine were completed by 500 feet AGL. Captain Green continued with the approach and made an uneventful landing. The engine failures were later determined to be caused by material deficiencies within the engine fuel system. The prompt, correct evaluation and timely actions of Captains Green and Voorhees during this critical in-flight emergency attest to their superior abilities and outstanding airmanship. WELL DONE! ★

CLOSE ENCOUNTERS OF THE BIRD KIND