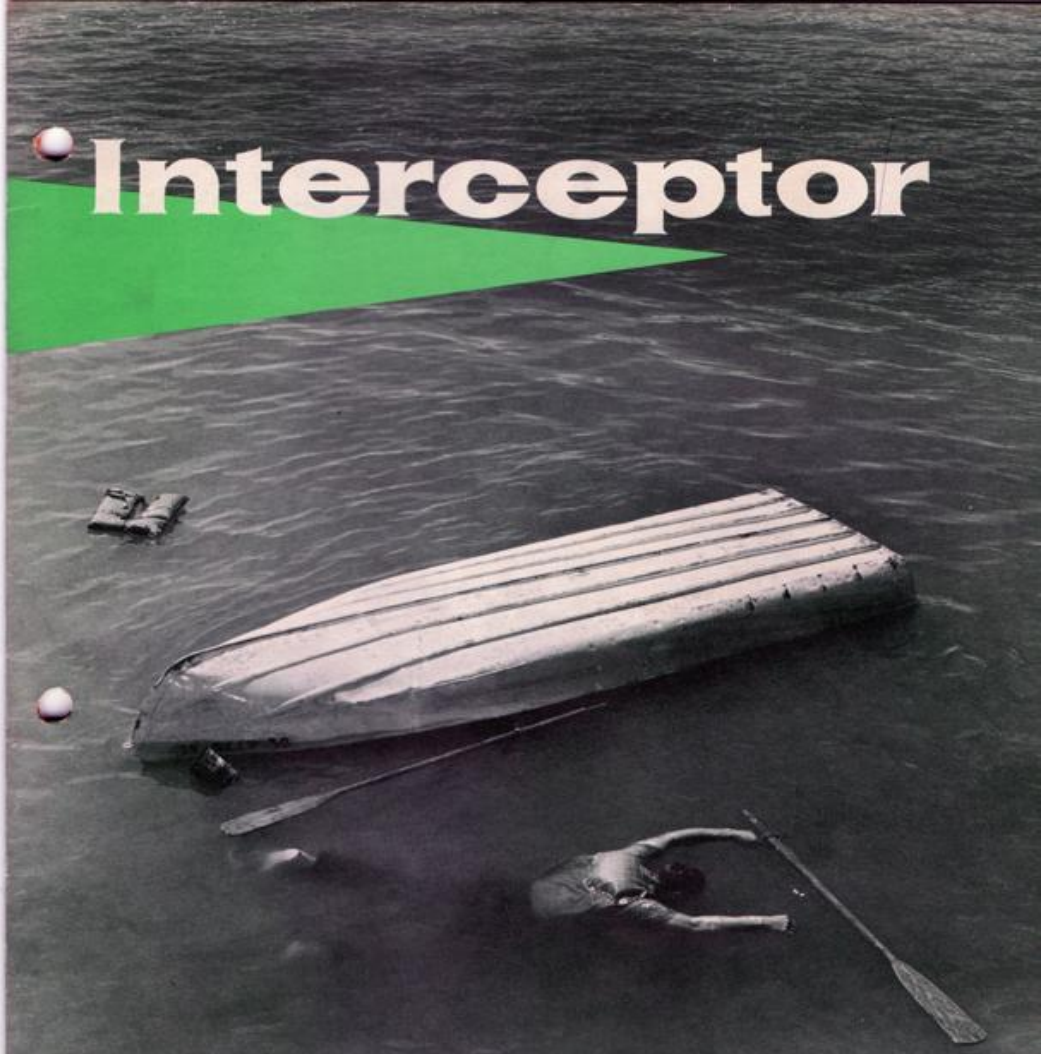
Interceptor



DROWNINGS:
what causes them?

. . *see page 16*

AUGUST 1967

FOR THE MEN RESPONSIBLE FOR AIR DEFENSE

Interceptor

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number 8

ADCRP 127-2

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Hq ADC Field Printing Plant
Ent AFB, Colorado

spotlight

A bore is a man who, when you ask him how he is, tells you.
Bert Taylor

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OUR COVER

A summer day - the wonderful relaxation of the water. A once peaceful scene turned into tragedy. The story of our drownings in ADC, page 16.

memo

from the CHIEF OF SAFETY

AWARENESS OR DOOM

COL. OLIVER G. CELLINI

We live our days in a world of comforts where relaxation is automatically afforded us by the machines that do our work, our computations, prepare our food, mow our lawns, fly our airplanes, and now, provide automatic cruise control for automobiles. Comfort through automation — it's all part of the sales pitches, too: quieter rides, power steering, power brakes, reclining seats, power windows, electronic timers, and remote controls for the stereophonic cartridge units and television sets.

We've made it too easy on ourselves to become lulled into a false security provided by these automatic, air-conditioned luxuries. The mind too often relaxes with the body, forgetting or failing to realize the sudden, terrible, inherent dangers associated with high speeds and the failure of machines and human beings. To be relaxed, supposedly, is the way to be.

On some of our superhighways, it's possible to get arrested for not keeping up with the rest of the traffic that cruises along at speeds in excess of 70 miles per hour. Too many supercarbureted and plush machines are being "semi"-guided by human minds that are not staying up with the car at all, but are at the hairdressers, the boss's office, or reliving the night before.

It's the same flying airplanes. Pilots may be oblivious to the dangers around them, refusing to exercise the relaxed mind with the unpleasant thoughts of what will I do if this or that emergency occurs. Then when a sudden failure does occur, like a blown tire at high speed, or an intoxicated driver switching into your lane, or having your engine quit on takeoff, the rude awakening to the dormant brain too often ends in tragedy — pitiful, pathetic, unneeded, human tragedy.

The luxury of operating from a 12,000 foot runway is to the fighter pilot an example of another unconscious, false, security blanket. If the drag chute fails—so what? So we land a few thousand feet down the runway, so who cares? Landing patterns and approaches become sloppier and lazier. If you don't believe this, then explain to me the 19 (excluding abort takeoffs and approach end engagements) barrier engagements to landing ADC aircraft on runways over 10,000 feet in length in the past 18 months? Waiting too late to eject from a sick airplane by riding the comfortable cockpit to the ground is another tragic example of an alert brain out to lunch.

The point I'm trying to get across is this: We've got to **keep our action thinking motivated.** To insure a constant awareness of panic emergency procedures, we must unconsciously plan ahead with alternate courses of action in the event this happens, or that happens. Drive your automobile defensively, like every other guy on the road is out to get you — physically relaxed, but always mentally alert. Fly the airplane the same way with every landing pattern and approach, as if the drag chute might fail, or a tire might blow.

I don't mean that we should live the action parts of our daily lives as prophets of doom, but that we should never in action be lulled into relaxing our awareness.

HOT LINE

THE WORD ON PITCH-UP. A rather fast, unofficial count shows there have been about 30 major accidents resulting from pitch-ups. At least 20 of these were caused by the jocks. Many of those that were charged off to other causes had strong pilot factor flavoring. We do not have a record of all of the pitch-ups that occurred where the pilot successfully recovered, but we're sure the ratio would be about the same.

There are two things that stand out from the most recent occurrences. The first naturally is the increase in the number of pitch-up incidents. Following the experiences of the first few years, the occurrences fell off to one or two per year. However, there have been at least six in the last twelve months.

The second point is the fact that pilots are not using the correct recovery procedures. In one case the pilot pitched-up off a tanker at 29,000 feet. Everything looked good as the chute came out and the nose stabilized below the horizon. However, the pilot apparently tried to recover before he had sufficient airspeed. He ejected just before impact.

The second incident also occurred on a refueling mission, only this time below 20,000. This pilot ejected almost immediately as the aircraft passed through 15,000 feet out of control. Number three happened to a rather new RF-101 driver practicing pop-up maneuvers in SEA. He was very light on fuel making an AB climb. As you know the nose gets pretty high. In this case the airspeed got too low before he recovered. The message quoting him said that when the aircraft pitched-up, he neutralized rudders, applied forward stick, and as soon as he felt negative ""G's" *deployed the drag chute*. He ejected as the aircraft passed through 6,000 feet.

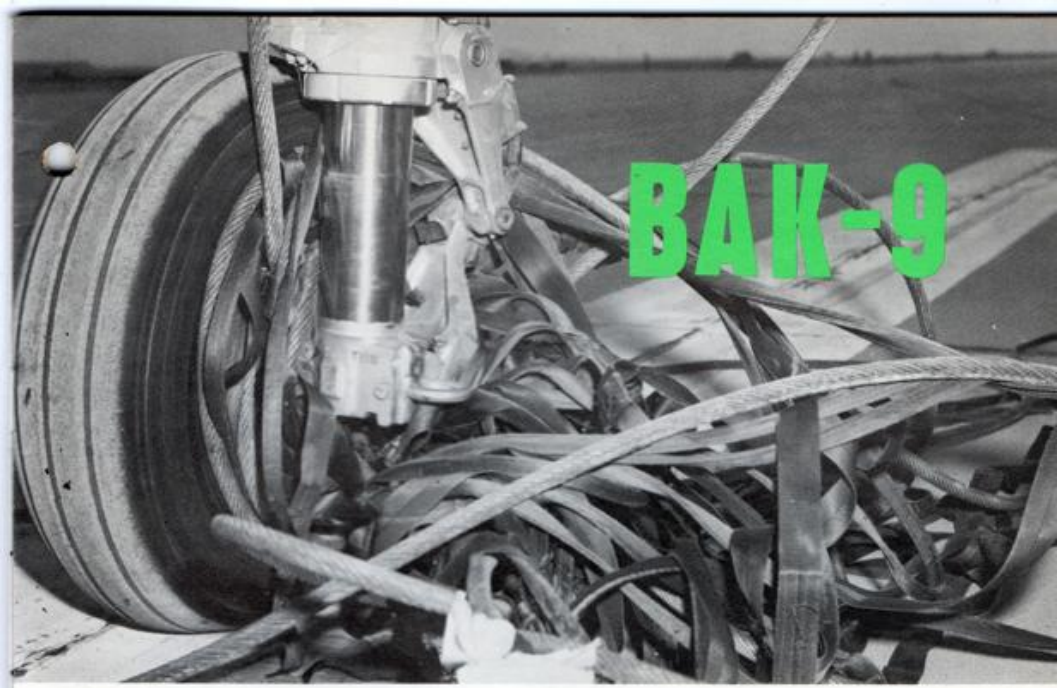
The most recent three incidents involved one aircraft and one pilot. He was on a test mission in a newly modified aircraft. While performing the pitch check, the aircraft suddenly pitched up with little or no warning. Normal recovery procedures were used and the aircraft recovered without use of the chute. The AMA performed a check of the bird and it "Ground checked OK". The aircraft pitched-up again on the second flight. This time the pilot used the chute during the recovery and the bird came out of it as advertised. The pilot then became too inquisitive and continued the deceleration check and got into a second pitch-up, without a chute. This recovery was hairy but successful. Experience probably helped, but the quick use of the proper procedures proved successful again.

The pilot stated that the chute helped to get a nose low, no wing roll condition. He said that he believes he held the stick forward too long on the last attempt. As soon as he moved it back toward neutral the airspeed picked up immediately. He felt that the "G" meter was the most help to him, although it was very hard to read because of the severe shaking.

On the second check the AMA found the aircraft was about 400 pounds light in the nose, the stab actuator was malfunctioning, and the stabilator was binding. The weight and balance on the modified RF-101 G/H aircraft is very critical. Ogden has issued T.O.s to increase the amount of ballast in the nose.

We believe that it would be wise for all units to review the pitch-up procedures and the movie, "The Word on Pitch-Up." Then, most importantly - fly the Voodoo within the envelope.

DROGUE GUNS. Drogue guns, like any other guns, must be handled properly if they are to be useful tools rather than dangerous weapons. T.O. 14D1-2-251C, 24 June 1966, requires that the chute be handled with great care and the gun pointed away from people and at a "suitable parapet". This is clarified as a minimum of a one inch plywood wall perpendicular to the gun barrel.



BAK-9

With the help of AIRSCOOP Magazine we thought that it was time to refresh everyone's memories on BAK-9 barriers. To start with, we have a regulation which specifies who is responsible for inspection of the barriers:

"ADC Regulation 91-8 requires that aircraft operations personnel and base civil engineering personnel will inspect each barrier a minimum of twice daily to insure each barrier is fully operational and available for use. If a barrier is found to be non-operational the base commander and the base civil engineer shall be so notified immediately. In addition, it requires capability be maintained on a 24-hour basis for immediate reset of all barriers installed on base to insure that any barrier will be returned to fully operational status after an engagement. Personnel other than base civil engineering should trained and available to assist the base engineering staff in the accomplishment of this function. ADCR 91-8 designates the ranking on-duty fire protection and aircraft rescue unit supervisor to be responsible for and supervise the resetting of all barriers. All fire protection supervisors will be thoroughly trained in the operation and resetting of each type of aircraft arresting barrier system installed. ADCR 91-8 also designates that aircraft maintenance engineering will be responsible for the inspection and maintenance of brake and hydraulic systems of BAK-9 and BAK-12 barriers and insure they are fully operational."

At one of our more active bases, we got someone to take us to the BAK-9 pits for some photographs for an article on barriers. After a few minutes of uninformed poking around, we discovered that the cam that programs the braking action was not "zeroed out." In fact, the zero index marking was one-third of a turn from where it should have been positioned.

So, what would this have done? This maladjustment would have increased the amount of stopping force initially applied to an engaging aircraft. Given an over-age tape and an incorrectly set cam, a tape failure would result. To someone in an F-106 with asymmetrical gear, a broken tape during an approach-

Rodents did this damage to a barrier tape.

end arrestment can mean the end of the road. He can stop worrying about lung cancer and the population explosion because he probably won't be around to face those problems.

We hate to admit it, but there are other indications that our barrier maintenance and inspection procedures require local inspiration. For example, take a look at the tape in the photograph. Guess where that one came from? One of our closed up air patches. The frazzled appearance is because some rodents (best guess: rats) had been gnawing on it. There are inspections that are supposed to catch trouble spots like this. Why wasn't this caught before disassembly if the inspection (tape pull-out) had been done every 30 days? Perhaps we aren't giving someone a fair shake. It could be that the inspection was made and then some hungry rats moved in fast and nearly chewed the tape in half. Possible, but not too probable.

In the interest of safety education, several articles have appeared in various commands' publications defining arresting barrier capabilities, descriptions, and engagement techniques. While no one can argue that these factors are unimportant, there is one other aspect no one has taken through the hurdles. That is the subject of time change requirements and inspection items.

What follows concerns the maintenance and inspection of the BAK-9 arresting system. While we will not specifically discuss the BAK-12 system in this issue, the systems are quite similar and most of the routine inspections apply to the BAK-9 and BAK-12 systems.

BAK-9 AIRCRAFT ARRESTING GEAR

The operation, service, and repair of the BAK-9 system are thoroughly discussed in T.O. 35E8-2-4-1. We do not have the space available, nor is this the right place to discuss every inspection and maintenance action required for proper upkeep of the BAK-9. We have attempted to cover the easily identified discrepancies that are listed the Technical Order.

DAILY INSPECTION - BAK-9

- Check all runway hardware for security. (See Figure 1)
- Check the fluid level in the reservoir. Fluid should be centered in the sight glass. (See Item A, Photo I)
- Check the static accumulator: the fluid level must be between the mid-point and the top of the sight glass. Pressure must read 175 ± 10 psi. (See Item B, Photo I)
- Check tapes for pendant tension. There should be no slack evident.
- Tachometer gage must read "zero". (See Photo III)
- Telltale pressure gage set to static pressure. (Static pressure is normally 175 ± 10 psi at sea level.) (Not visible in photo; it is a single pressure gage just below the rewind pin located on the back side of engine.)

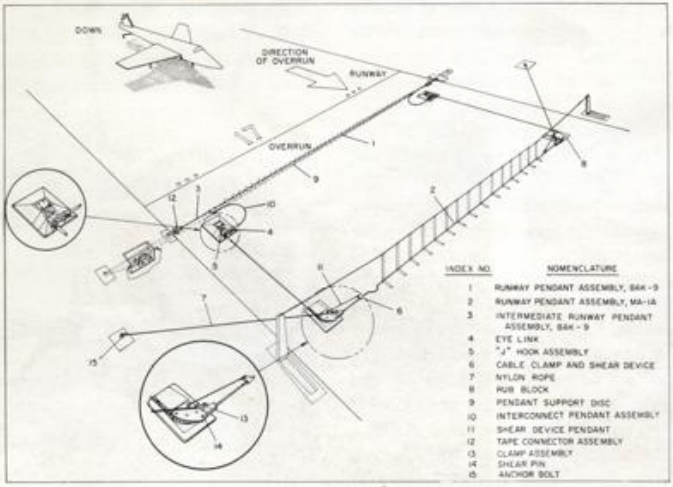


FIGURE I

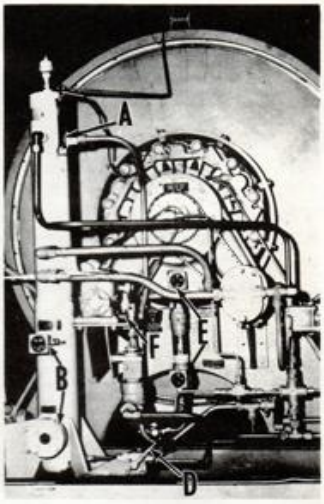


PHOTO I

• Be sure that the rewind pin is seated in the shallow groove on the rewind pin cap. (See Photo II)

• "Static" selector valve handle full right. (See Item D, Photo I)

• Clutch accumulator pressure should read 800 psi (+200, —0) on the top and bottom gage. (See Item E, Photo I)

• Check that the zero-index marking on the cam is aligned with the cam follower. (The zero-index is in the six o'clock position when aligned with the cam follower.) (See Item F, Photo I)

• Check the MA-1A Interconnect pins and bolts for deformation or failure.

WEEKLY INSPECTION - BAK-9

• The cross-runway pendant cable must be inspected weekly and after each engagement. The pendant must be replaced if any of the following conditions exist:

Four or more broken wires are found in any six-inch length of cable.

If a kink occurs which is not removed under the normal (1500 to 2000 pound) pretension load.

• Inspect the numerous rubber discs that support the cross-runway pendant. A disc should be replaced if worn to the extent that it will not remain upright. Also, a disc should be replaced if it is worn so that the pendant clears the runway by less than two inches.

MONTHLY INSPECTION - BAK-9

• The monthly inspection of the BAK-9 requires that the tape be pulled out to a length of 800 feet. Along with checking the rewind system, maintainers are required to inspect brake lining wear and inspect the hydraulic system.

• The pendant cable should also be lubricated monthly with a commercial wire lubricant or with lubricating oil (Mil Spec MIL-L-2104).

• Inspect MA-1A pendant cables and lubricate with wire lubricant or oil.

• Replace all MA-1A interconnect shear pins and shear bolts. Replace spreader plate and lubricate locking pin.

BI-MONTHLY TIME CHANGE REQUIREMENT

• Every two months the nylon ropes used with the MA-1A interconnect system should be replaced.

SEMI-ANNUAL INSPECTION - BAK-9

• The nylon tapes in the barrier system will lose their strength after prolonged exposure to sunlight. In order to insure adequate strength over a period of time, the length of tape between the runway edge and the tape connector (the tape section visible during everyday operations) should be cut off and discarded at six-month intervals or after six engagements.

FIFTEEN MONTHS TIME CHANGE - BAK-9

• Replace the cross-runway pendant every 15 months. ★

PHOTO II

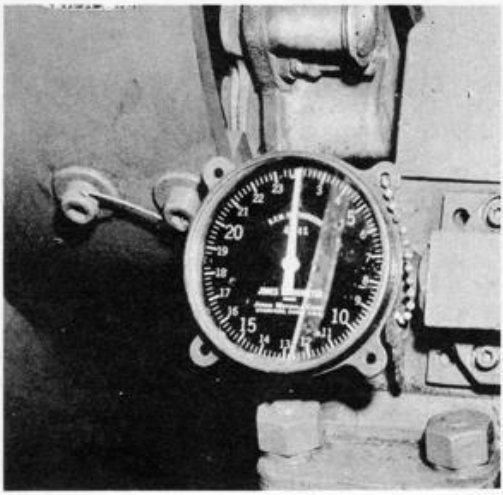


PHOTO III

"YOU CAN DO IT!"

Many words have been written and spoken about how to survive. When it comes down to competition between an individual and the elements, our will to live will be the deciding factor.

The crew briefing was set for 1700 hours. All of us were there a little early so the aircraft commander started his briefing about 10 minutes earlier than the actual crew briefing itself. The takeoff was set for 1930 hours. He went through the complete checklist reading most of the emergency procedures; he didn't read them all. He left out the section on getting out of the aircraft on the ground. He did ask questions and everyone stated that they knew the emergency checklist.

When we arrived at the aircraft it appeared that there was something abnormal about the bird. There were a particularly high number of maintenance troops around it. The only work they did, however, was to change a radio antenna connection inside the aircraft.

After that the engines were started and we began to taxi out. The only thing unusual that I could say was that the run-up seemed particularly long to me, but this could have been because we started engines slightly early and that the aircraft commander was taking his time on the run-up to use up some of the time so we wouldn't take off too early. After the run-up the flight engineer came back and got a gallon of hydraulic fluid from the latrine area with the adapter for pouring it, and took it to the front. About two or three minutes later he came back with the adapter and empty can. He threw the can away and put the adapter back in its place.

As part of the run-up procedure, there are two checklists we use prior to the act of getting airborne. O

is the emergency ICS and the other the alarm bell check. This sounds throughout the aircraft. Where I was sitting the check was fine. I believe there was some trouble in the rear and that the check had to be completed twice before the pilot got an answer from the jumpmaster. Whether it was because the jumpmaster wasn't on the interphone at the moment, or whether he didn't hear it the first time, I don't know.

We took the active runway; the aircraft was brought to max power before we started rolling - sometimes we start to roll before max power - in this case, max power was brought up, the brakes were released and we started to roll. I would say we were airborne in the normal length of time; I don't think it took us any longer than normal to get off the ground. One particular thing I noticed, and I mentioned this to the man sitting next to me, we did stay on max power what seemed to be a longer period of time than normal - in fact, much longer than normal. Normally, the first power reduction back to medial power is, I would guess, around 250 to 500 feet. In this case, we were well past the end of the runway at 1,000 feet or better before we came back to medial power. The airman who was sitting beside me stated at the time, "We have stayed on max power a long time," and I agreed with him.

Shortly after reduction of power, the Aircraft Commander came over the PA, said we were at 2,000 feet, and we were cleared to get up and walk around and start our work. I got up, took off my life preserver, hung it over the back of my seat - I talked with the other navigator for a moment, because we hadn't decided who was going to work the table first. We decided at that time that I would take it. I walked back to the Nav position, unhooked the seat, put it in front, got my charts ready, reached into my kit and got out my computer, and at that time I noticed that the doppler was reading 999 knots, which I was sure was incorrect - and hoped was incorrect - and as I watched, the doppler had run down to 999 and was starting on its way back up. The memory light was not on, so it was supposedly showing our actual ground speed for the doppler, and it continued to run up. I called the Nav Tech and he came back, looked at the computer read-out for latitude/longitude and stated that the computer was not working because we were getting no indication of movement for our latitude/longitude read-out. He also stated he had never seen this type of thing happen before. He went to the rear of the aircraft and checked fuses on the computer and at that time I felt an explosion, or it could have been we hit something. There was a slight rocking of the aircraft. It felt like the aircraft did a right wing lift slightly and came back down again.

After the explosion I saw smoke coming out of the vent above my head. I reached for the microphone and called the Aircraft Commander and stated that this was the navigator and that we had smoke coming from our vent. I got no response. From this point on, anything that I stated over the intercom, I received no response for. The engineer was coming back. I looked toward the cockpit and saw him coming back and he turned in front of the galley to look out the window toward the right-hand side of the airplane. I immediately looked out the over-the-wing hatch and noticed that Number 3 engine was feathered and since that time, I've thought possibly the bump of the explosion I heard was Number 3 engine feathering. I saw no fire on Number 3 at this time. I could see the complete engine and there was no fire and no smoke. But I could see the reflection of flames which were coming from the area where Number 6 fuel tank is on the fuselage itself. If it was on the wing, it was very close inboard, because looking out that hatch, you can see within a foot or two of where the wing attaches to the fuselage and there was no fire that I could see up to that point, but I could see the reflection of flames.

After I saw the flames I came back to the Nav position and cleared my equipment off the desk and just threw it in my bag to get rid of it. I wanted to get it out of the way. I grabbed the Nav stool and threw it in the latrine to get rid of that. The engineer came back and looked out the over-the-wing hatch. I then cleared forward to my seat and cleared everyone I could out of the way and told them to get back to their ditching positions to try to clear the area. The engineer, after looking out over the wing, came back and looked in the drift-meter. There must have been some modification done on this drift-meter. The drift-meter was 180° out. It was mounted backwards in the aircraft. We had never seen one like this. It was also loose in the aircraft and there was a possibility also that this engineer was looking at the wrong engine. He may have intended to look at the engine and was looking at the wrong one.

For a period of about two minutes after the explosion, the aircraft flew straight and level. After this two-minute period, the aircraft went into a steep dive which scared everyone in the aircraft. I felt that it was a very steep dive with a very high power setting on the engines.

Before the aircraft went into a dive and while I was getting into my exposure suit, the flight engineer came back, entered the latrine, got a gallon of hydraulic fluid, and

rolled it toward the front of the aircraft. I grabbed it and it continued to roll toward the front. He grabbed another one and an adapter and ran forward with it. About this time, I turned around and sat down in my seat to finish getting on the exposure suit, and I could see a flame inside the aircraft. It was by the camera area on the right-hand side of the aircraft and as I think of it, it looks as though, in my mind, that it was under the floor and was burning its way through as though we had a fire in the lower baggage compartment, and it was coming through.

Just about this time, we pulled out of the dive and the man sitting next to me said we were over land and we were about 1500 feet. I didn't look out the window. I just took him at his word. The smoke in the aircraft was just as though we had had another explosion and smoke immediately came pouring in through the exhaust ports - the intake ports - the vent ports - very, very heavy black, acrid smoke - the type of smoke you see at an oil fire; very heavy smoke just poured into the aircraft and from this point on, I could no longer see the rear of the galley, except near the floor. The smoke was so heavy that you couldn't breathe it. At this time I realized that if we didn't get on the ground pretty soon or somewhere pretty soon, no one was going to make it, because you couldn't breathe this and at this time I could see fluid that looked like it was pouring across the floor just this side of the camera position, on fire, toward the right-hand side of the aircraft, toward the Radio Operator. I saw the left over-the-wing hatch come out and it was thrown on the floor. I took it to be the Radio Operator that did this. I didn't see him but I did see the hatch thrown on the floor and a man run from the rear of the aircraft to the front wearing a parachute harness and his parachute. Whether he was trying to get out and couldn't clear the aircraft rear or whether he was trying to get out of the smoke by coming forward, I don't know.

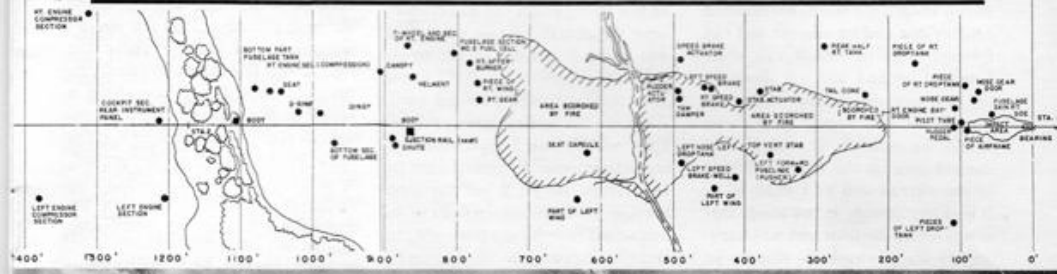
At this same time I noticed something on the galley table. I don't know what it was; I know there was something there. I reached forward and turned to get it off the table because it was directly in front of me and would have hit me if we went in, and then apparently we hit, and I feel that I was thrown back in the seat on this side. I remember immediate quiet. I don't know what the RPM setting was, but it was a very high RPM and a lot of engine noise and the minute we hit, it was complete silence. The next thing I remember was I was in a position where I felt that I was face-down, bent in a sitting position with my neck back and my arms behind me, pinned. I could hear water. It sounded like a gurgling brook - water coming in. I tried to move and couldn't. I was pinned in and the water was coming in and I was being covered with water. I struggled a couple of more times and whatever it was that was pinning me moved away - broke away - floated away - something, and I started to swim up. As I came up, it got lighter, and lighter and when I broke the surface of the water, there were flames as far as I could see. I splashed and went back under the water and tried to get air and tried to stay cool. As I came up, I was turning and I could see that I was on the edge of the fire, further away from land; in other words, as though the aircraft hit and I had been thrown forward of the fire. I was on the sea side of the fire. The exposure suit continued to fill with water which pulled me under. I worked the suit off and floated on my back for what I would guess to be 10 to 15 minutes, splashing to keep the flames away on the oil on the water and what appeared to be oil-soaked insulation from the aircraft. Then a large part of the aircraft I saw, which looked to be an engine nacelle, was burning - floating nearby and burning. I couldn't swim. I tried. The waves were just enough and my arms were numb enough so I could not make any progress and I decided to float on my back and after 10 or 15 minutes, something hit me on the right hand and it turned out to be the bulkhead between the Nav position and the galley - a half round bulkhead. I crawled on top of it and laid on this until the helicopter came by and picked me up.

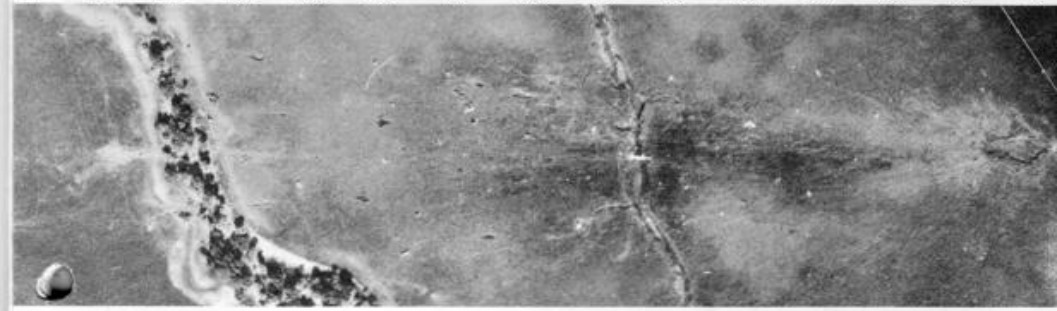
In looking back the best survival item I had was my mind. Had I gotten my LPU on, it would have kept me afloat but this could have killed me also, because if I stayed above in that fire, I'm sure I would have been burned up there. What saved me was being able to get back into the water and splash the water away while I came up for a breath of air. This went on, I guess, for two or three minutes, of underwater, up, splash, take a breath of air, and right back under again. During this period of time I got my exposure suit off because it was filling up with water and almost dragged me under to the point where I couldn't get back to the surface.

A raft certainly wouldn't have done me any good because of the fire. If it popped, it would have burned and if I hadn't popped it, it would have dragged me under at that point. So it was more a matter of doing what I could to get air, staying out of the fire underwater, to stay cool as much as I could.

I think the fact I kept saying to myself, "You can do it!", more than anything else, contributed most to my survival.

PRIMARY CAUSE: UNDETERMINED





The aircraft collided with the ground with such impact that it was completely destroyed, and so were the lives of the two occupants. No emergency had been declared, the aircraft had no known malfunctions, and the pilots were "old heads," in good physical condition. Primary Cause: . . . . . ?

Let's review this tragedy through the eyes of the Accident Investigation Board, and draw our own conclusions. This accident did not occur within the Air Defense Command, but is none the less important to us for we still have Voodoos and fighter jocks.

The mission was scheduled to be an instrument training flight. Both pilots had more than 500 hours in the Voodoo. They filed a DD175 IFR flight plan for VFR conditions on top within a 150 NM radius of their home base, estimating 1 + 30 enroute with a nearby Air Force Base as an alternate.

The aircraft was configured with two full 450 gallon external fuel tanks. A normal preflight was accomplished with no discrepancies noted, and the flight made its scheduled takeoff time. Shortly after becoming airborne, they contacted Center and flew to the area of their alternate. Center effected a radar hand-off to the Approach Control which had jurisdiction over their alternate airfield. The flight requested clearance to hold at a nearby fix and then execute a TACAN penetration with an ILS low approach to their alternate airfield. They were cleared as requested. They reported penetration turn and at this time Approach Control cleared them for an ILS low approach to the instrument runway. After they acknowledged the clearance, the Approach Controller observed the aircraft making a right turn away from the ILS course and towards the penetration VORTAC, which was located approximately 15 NM north of the base, and then lost radar contact. The controller attempted to make radio contact, but to no avail.

A Rescue "Chopper" was scrambled from the base to search for the aircraft, but was unable to maintain visual contact with the ground due to a fog bank in the vicinity of the area where radar contact was lost.

Ground search parties worked all night, and at first light in the morning, search planes were dispatched to the area, and the wreckage was sighted on an island off the coast. Both pilots were fatally injured and

Dramatic imprint of aircraft at impact point.

the aircraft was completely destroyed.

The aircraft struck the ground at a relatively high sink rate in a near level or slightly nose high attitude. None of the seat or canopy catapults had been fired. All indications of fire were determined to result from ground explosion.

The TACAN and ILS selectors were set to the proper frequencies, and the correct heading for the inbound course of the ILS approach was set in both cockpit course windows on the ID 387s. The course deviation indicators on both ID 387s were deflected to the right, indicating the aircraft to be to the left of the selected course. The TACAN ILS switch was found, but due to crash damage, the position of the switch could not be determined.

The fuel quantity gauge was recovered and indicated 12,000 pounds of fuel remaining at time of impact.

Aircraft configuration at the time of impact was determined to be with the landing gear and wing flaps retracted, speed brakes extended, and the drag chute not deployed.

Teardown and inspection of the engines indicated both engines were operating normally and at high power settings (estimated at 90% or higher rpm), and the afterburners were not selected.

The True Airspeed Indicator was indicating 311 knots at impact. This converts into 309 knots IAS at sea level, which was their elevation for all practical purposes.

According to the Chopper pilot who was in the area immediately following the crash, a fog bank, tops at 800 feet, covered the coast in the vicinity of the crash scene. The weather at the base of intended approach was forecast to be VFR, and was, in fact, VFR at the time of the crash. The flight was filed under IFR/VFR Conditions on Top because of the departure weather at the base of origin. Had the aircraft maintained an altitude above the tops of this fog bank (800 feet), its presence should not have been a factor in this accident. Because the aircraft *had* to pass through this fog bank prior to striking the ground, it is the belief of the Investigating Board that this obscuration of the ground was a probable contributing cause.

The aircraft descended to the prescribed minimum altitude for the penetration (2000 feet MSL). This altitude was reached after completing approximately one-half of the penetration turn. This is the normal level-off point for this penetration.

The penetration and approach to the crash scene were flown by the Accident Investigating Officer and an Instructor Pilot in an identically configured aircraft. *All* facets of this flight were strictly regulated so as to duplicate the ill-fated flight as closely as possible.

It was suspected from the radar plots that the pilots failed to switch the ILS-TACAN selector switch to the ILS position prior to the inbound turn to the ILS, thereby homing back into the VORTAC. This would explain the turn away from the published inbound ILS track. It would further explain the heading at the time of impact. This situation was closely duplicated and the turn continued toward the CDI which was deflected to the right. The aircraft flew directly over the Center of the impact point and crash site.

The letdown was timed by stopwatch from the point of departing the Initial Approach Fix until directly over the impact point. As closely as can be determined, this time (5 minutes and 50 seconds) coincided to within 15 seconds of the time as extracted from the Approach Control tape.

Reports from technical teardown and analysis of engine parts and control actuators have indicated that no malfunctions or discrepancies were found. All systems were operating normally at the time of the crash.

Both the instructor and the student involved in this accident were well qualified pilots. They both were in known good health during the day of the fatal flight. There were no major medical deficiencies in their backgrounds, and the autopsy and pathological reports offer no evidence of physical incapacitation during the flight.

Since it was suspected that the pilots failed to turn the TACAN-ILS selector switch to the ILS position, it is believed that the student pilot became so obsessed in correcting his inbound course that he allowed the aircraft to descend below a safe altitude.

It is unknown why the Instructor Pilot allowed a dangerous situation to progress; however, it is felt that he did attempt to recover after the aircraft had penetrated the fog bank. Disorientation caused by poor visibility and lack of reference with the ground probably contributed to momentary confusion. This confusion delayed recovery attempt until it was too late. This would account for the advance in engine rpm from 80 percent (normal penetration rpm) to 90 percent or higher (known rpm at impact). It would further account for the increased airspeed (309 KIAS at impact) and the obvious high positive "G" loading as indicated by the size and depth of the impact hole.

The findings of the Accident Investigation Board are as follows:

• PRIMARY CAUSE: . . . *UNDETERMINED* . . . inasmuch as the board could not find any conclusive evidence to support a primary cause factor in this accident investigation.

• MOST PROBABLE CAUSE: . . . *SUPERVISORY FACTOR* . . . in that the IP did not take positive action in time to prevent the aircraft from descending below a minimum recoverable altitude.

• PROBABLE CONTRIBUTING CAUSE: . . . *WEATHER* . . . in that the aircraft's entry into the weather severely restricted flight visibility and the pilot's visual reference with the ground. This condition could have produced spatial disorientation and further complicated recovery from a dangerous condition.

The puzzling, almost alarming aspect of this bash is the fact that two experienced "old heads" were in a mechanically pure machine, on a properly planned, briefed, and almost up to the time of impact, flawlessly executed mission. The weather could have been a contributing factor, but certainly no more. The level-off at 2,000 feet at the proper point in the penetration combined with the fact that they had tons of fuel (6, to be specific), and that the weather at the base of the intended instrument approach was VFR, could very well have lulled the IP into a false sense of security. It is logical to assume at this point that the IP could very well have had his eyeballs in the cockpit making notes on the progress of the instrument approach. At about the same time the rear seat jock could have noticed the off-course indication from the Course Deviation Indicator.

In order to clarify the general published jet penetration pattern in our Mind's eye, let's visualize a VORTAC approximately 15 NM north of the base, with the instrument runway oriented east and west and the ILS inbound course on Runway 27. Outbound heading off the VORTAC would be to the east with a penetration turn in a southerly direction to place the aircraft on the ILS final approach course to the base.

Actually, he was not off course, but since the TACAN-ILS function switch most likely had not been placed in the ILS position, and the penetration VORTAC was approximately 15 NM north of the base, he thought he was off course. Subsequent mental confusion entered his mind and distracted his attention from his altitude.

Let's digress for one moment and make an assumption. It would seem possible that if a century series fighter aircraft weighing approximately 44,000 pounds traveling at between 250 and 300 KIAS was allowed to assume an unusual attitude, 2,000 feet could be lost fairly rapidly and that a high airspeed would be necessary to correct the situation, depending on how extreme the attitude was.

Now, with the IP making notes on the approach, and the back seat pilot trying to correct for a nonexistent error and trying to figure out why he was off course, they could both have been distracted just long enough to allow the bird to assume a nose-down attitude. The fog bank could have momentarily added to the IP's confusion as it could possibly have produced a horizonless image in his peripheral vision. At any rate, the stage was set for fate to play her hand. The IP, or the student, recognized the grave condition and attempted to recover, but TOO LATE. In a matter of seconds, an almost flawless mission became a mass of molten metal, and broken bodies.

The next time we are beset by a feeling of "all is well" while flying, regardless of the phase of flight, let's remember that that is the time to become alert. Let's not allow ourselves to become tragically hypnotized by a false feeling of security. With this in mind, we'll close with Webster's definition of complacency: "Self-satisfaction accompanied by unawareness of actual dangers or deficiencies." ★

the CHEST PACK

by **CAPT H.S. ELLIOT**
Life Support Officer
4600 Air Base Wing
Ent AFB, Colorado

One riser disconnected - with chute still in full blossom.

Notice cross position of body during drag.

In view of the fact that most of us could find ourselves in a support type aircraft to get from point A to point B sometime, our Life Support types have offered the following observations that it might be well to heed.

If you've done most of your flying lately with the seat pack or back pack parachute, then there are some differences between them and the chest pack that you should be aware of.

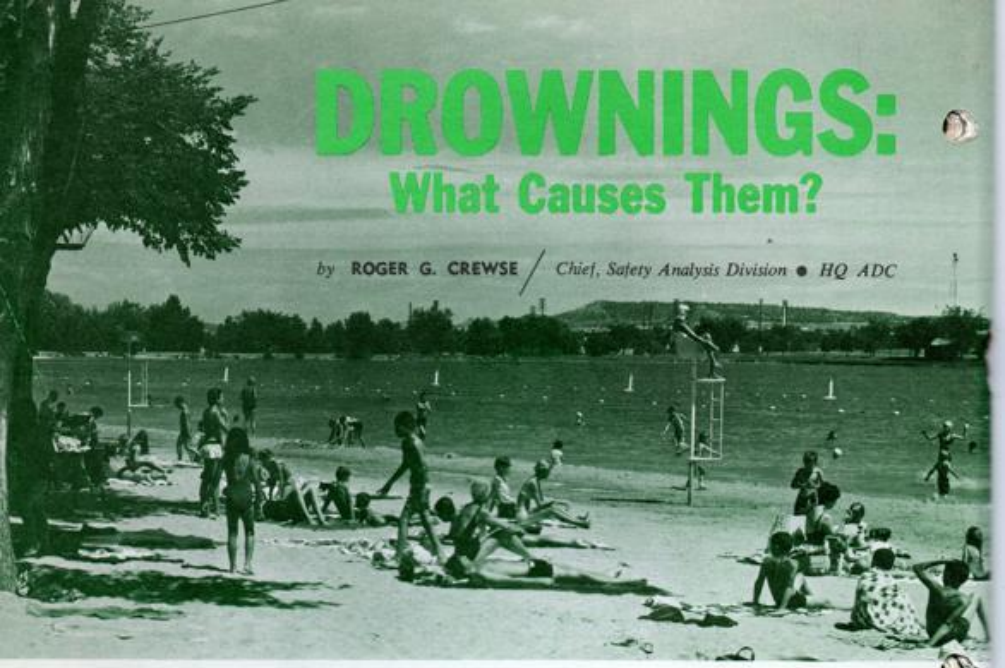
The first difference, and the one that causes the other differences, is in the construction of the chute itself. In the pictures you will notice that when the chute opens, you have only one riser on each side instead of two. These risers lead up to a pack tray above your head. This makes the "arm through the risers" method for a high wind or water landing obviously impossible. The pack tray also obscures your view of the suspension lines and will make the "Four Line Cut" difficult if not impossible. For a high wind or water landing preparation, you should firmly grasp each riser, in turn, and release the safety cover. Then grasp your harness over the quick release. Don't put your fingers through the cable. As soon as you touch the ground or water, release both quick releases.

This brings us to the second difference. As you can see from the pictures, releasing one riser doesn't do a thing for you. If you're on the ground, it'll cock your body. If you're in the water, it'll twist you through the water. You're still going to be dragged unless you get both releases as soon as you touch the ground or water.

The chest pack is a good, reliable parachute, but it is different from what most of us are used to. Be aware of those differences. ★

Harness and risers of chest pack.

Chest pack position for bailout.



DROWNINGS:
What Causes Them?

by **ROGER G. CREWSE** / *Chief, Safety Analysis Division ● HQ ADC*

Several months ago we reviewed 137 USAF accident reports where drowning occurred. In the first six months of this year, Air Defense Command drownings were higher than they have been for several years. We therefore decided it might be a good idea to pass along to you some of the information that we gleaned from the accident reports reviewed.

As might be expected, the majority of our drownings occurred when people were swimming as a primary activity. Thirty-seven Air Force personnel drowned in this category. An additional forty individuals also drowned in conjunction with boating activities. Quite surprising was that eighteen of our people drowned while the primary activity was wading. We lost ten who were scuba diving or snorkle swimming; nine who were fishing; while the remainder were engaged in miscellaneous activities not easily categorized.

Several similarities in many of the drownings became apparent. In thirty-three, people drowned upon initial entry into the water. Almost on impulse, it seemed, our people peeled off their clothes, leaped into the water, and took off in a great flourish and suddenly were in great difficulties. A good many of these people had not been swimming regularly, and had probably forgotten the physical effort required to keep floating, thereby overestimating their capabilities.

Involved here also with the initial entry into the water were the natural targets that exist in most public swimming areas. These targets - diving rafts, buoys, floats, ropes, etc. - by their very presence infer that the average swimmer can make it. Over half of our swimming drownings occurred while people were enroute to targets which they found they either could not reach or could not return from.

As an example, three airmen entered the water in an approved swimming area which was defined by a rope and buoy extending approximately 100 yards out from shore. All three of the swimmers started for the ropes. Two got there and were on the way back when they heard a cry for help from the slower one. They started back to assist him; however, before they could get there, they saw him flailing and go under less than five feet from safety. By the time his body was located, it was too late.

In another drowning, the individual dived off a pier and started swimming rapidly for a diving raft. Approximately fifteen feet away from the raft, he was observed in trouble, flailing, crying out, then sinking out of sight, quickly ar

permanently.

In a good many of the drownings which were reviewed, in fact forty, would-be-rescuers actually made contact with the individuals in trouble. However, rescue attempts were usually futile because the person attempting rescue did not know exactly what he was doing. The person who was being rescued was oftentimes fighting hard from sheer panic. Six Air Force people drowned while attempting to rescue another in trouble.

Many times the drownings were completely avoidable. In over 30% of all the drownings the situation, while critical, was not hopeless at all. A swimmer would find himself beginning to tire. He would then *program* himself into an impossible situation when he saw how far he had to go to reach safety. He hadn't tired to the point where he couldn't go on, he just knew he was starting to get into trouble. At this point he would panic, thereby utilizing more energy fighting his would-be rescuers and flailing wildly, than he would have had he continued to swim to safety. Once again, in over a third of the drownings, the situation in which the individual found himself, while critical, was not necessarily deadly. By panicking, flailing, grabbing desperately for rescuers, etc., the individual drowned.

A peculiar phenomena was noted in about 27 of the drownings in that the individuals involved made no outcry at all and gave no indication that they were in trouble. They merely disappeared under the water. Oftentimes they did this while swimming close to other personnel. In one of these drownings two of our people were swimming easily, side by side, in excellent water conditions. They had proceeded less than two or three minutes, when the survivor looked back and could no longer see his friend. Hours later the body was found in the vicinity where the survivor thought it should be. There had been no outcry - no fuss at all. In another drowning which involved a member of the Air Defense Command, and which occurred in June, similar circumstances were noted. The airman entered the water and swam out 25 or 30 feet. He was observed by his friends on shore. He turned, started to swim back, and without any outcry or indication of trouble, disappeared under the water. He was only about 15 feet out at the time. His friends were under the impression that the airman was simply swimming under the water and they took no action until they realized he was staying under an unusally long time - 35 to 60 seconds. At this point his rescue was attempted unsuccessfully.

These types of drownings may be explained by the fact that water struck the glottis causing a spasm, thereby rendering the man incapable of breathing or making a sound. It is difficult to imagine that some type of struggle would not have been indicated had that phenomenon occurred, but the fact remains that in almost 30% of our drownings there was little or no fuss on the part of the individual in trouble.

There is no doubt that exhaustion is a major factor in our drownings. Exhaustion breeds panic and panic breeds random actions and short circuits thinking.

In fact it would appear that in all of the drownings the single most important factor, the one which makes the drowning inevitable, rescue impossible, and exhaustion a certainty, is blind panic. However generated, either by the individual suddenly seeing that he is going to be in trouble whether he is or not, or meeting with the unexpected in unfamiliar water, or when faced with sudden cramps, panic renders the swimmer no longer functional and actually causes the drowning. Rescue attempts are almost always futile when the person involved is panicky because most of the rescuers don't know exactly what they are doing or how to handle the grasping, dragging, irrational individual they are trying to save.

Boating Accidents

In boating accidents where drowning occurred, a somewhat different situation was evident. In the 40 drownings associated with boating activities, it was probable that about half were indeed inevitable based on the situation in which the individual found himself. We say this mainly

These targets may be beyond your capabilities.

Great sport . . . if you know what you're doing.

because boating accidents occurred far from shore, beyond the capabilities of most any swimmer without flotation gear available. The majority of our boating drownings were caused by a capsized boat. A good many of these accidents were generated by the techniques of the boat operator. Additional accidents were caused by sudden squalls which resulted in heavy seas and loss of boat control.

Exposure and exhaustion were definite factors in about half of all those which resulted in drownings. These occurred because rescue was not possible or delayed. In many instances no one knew the individuals involved were even in trouble. Water and weather conditions slowly eroded physical capability to the point where drowning occurred.

In only 17 of the 40 boat accidents was flotation gear available. It was used in just seven instances and yet it was obvious that had life preservers of some sort been worn at the time of the accident, 28 of the 40 people would be alive today.

It was amazing to see that families would take to a boat in heavy water with 2 or 3 children who couldn't swim and even though flotation gear might be available, no one thought about wearing it. When the boat capsized and the children were thrown into the water, their father would usually die trying to save them.

It was equally amazing to us to see that people who could not swim one stroke would climb into a boat, go out on the ocean or large lake, and never even think about the use of flotation gear. When the accident occurred, of course they were immediately lost.

One of the Air Defense Command's boating drownings which was completely avoidable concerns two of our airmen who rented a boat with a 65 horsepower outboard motor and took to the lake. Neither of these people were swimmers. The boat operator had no training at all in outboard motor boat operation. The red wind-warning flag was flying the day of the accident which indicated that winds were high and that the water was rough. The boat was stopped about 100 yards off shore and the engine turned off. One of the airmen, with a ski belt on, got into the water and tried to put on his skis. However the water was so rough that he could not get them on so he climbed back in the boat. They tried to start the engine at this time, but all they could get was a clicking sound. The airman who had been trying to get the water skis on decided that he would go down and check the propeller to see if it was fouled. As he was going over the back of the boat without the ski belt, he slipped and fell backward into the water. He immediately yelled for help. His friend in the boat handed him a ski. The airman in the water caught hold of the end of the ski, and then lost his hold. He was then thrown the ski belt, but it fell short of his reach. The wind was now rapidly moving the boat away from him. The airman in the boat then threw a seat cushion and it too fell short of the victim. A ski rope was thrown to him but it tangled and didn't reach him. During this time both airmen were yelling for help and help was attempting to reach them, but it was too late. By the time it arrived, the airman had drowned. Once again a good time changed to a tragedy in about two minutes.

The Will to Live

A number of people just gave up when they found themselves in a difficult situation because they thought it was hopeless. To give up without trying, without a fight, without getting mad, without totally exhausting themselves, seems inconceivable in the cold, cold, grey light of dawn. But too many people did just this. It's obvious that their thinking was not conditioned by previous training. They were not prepared to hurt and fight. They were too willing to accept the inevitable.

We have some examples where people have survived under extremely critical situations. In one, only three people survived out of ten as a result of a ditching in the middle of the night in the Atlantic Ocean. Only one of the people who didn't survive was injured signi-

cantly. They all had LPUs inflated and survival suits, but no rafts. Of the three who made it, one held one of the other survivors up for over two hours. When questioned by the board after the accident he stated, "It comes down to this: If you're going to give up, you're going to die. If you want to live, you live." He had seen seven other people give up and die that night in the Atlantic Ocean.

Another survivor in a similar water situation was asked what his best piece of survival equipment had been. He responded by saying, "My head. Had I lost it, I would have been dead."

And still another in a very recent accident, a single survivor of a crash landing in the water stated, "The cold water was sapping my strength and I was beginning to lose all feeling in my hands. I became extremely angry at many things. I shouted and cursed everything and everyone that came to mind. I am sure now that this anger helped me to survive."

These are examples of what men can do by sheer will and determination. All you have going for you in a water survival situation is your head.

Psychologists and physiologists have studied fear and exhaustion in some detail. It has been stated that when an individual feels that complete muscle exhaustion has occurred, he probably has 20% of his total capability still remaining. In fact, the muscles will function even though great discomfort may be experienced until the point at which they cramp.

Emotions can be transferred one to another. It takes individual understanding of this capability, but, for instance, panic can be transferred to anger. Anger is a functional emotion. Rational thoughts and rational actions can be sustained. But the panic must be transferred at the onset, not after it is fully developed.

The will to go on and the will to live are probably as important factors in the reduction of drownings as any other single item.

Rescue Attempts

We found that time is extremely important in a water emergency. There are just about two minutes after a man quits breathing in which resuscitation attempts must be made if they are going to be successful. Because so many of our rescue attempts were futile when would-be rescuers had already access to the individual in trouble, it is apparent that water rescue training has not been effective. Oftentimes the would-be rescuer, long on guts, almost drowned himself because he didn't know how to handle a flailing, panicking, almost irrational friend. This portion of rescue procedures should be stressed in any water safety meetings. And because of the extreme shortage of time after a man quits breathing in which resuscitation is possible, it may well be that initial attempts at mouth to mouth artificial respiration must be conducted while the individual is still in the water. In many instances we saw that rescuers got to the individual who was unconscious but brought him to shore before any mouth to mouth was started. It is possible that had mouth to mouth been started on the way back, even though it was necessary to interrupt it several times, people could have survived.

We also saw in at least four of the drownings individuals in trouble were actually drowned being dragged to shore. They were still alive when the rescuers got to them, but in the attempt to bring them to shore, they dragged them through the water with their heads under, and of course the individuals drowned.

Furthermore, in eight instances, resuscitation attempts were abandoned because while giving mouth to mouth respiration the victim threw up. This immediately caused the rescuer to quit. Regurgitation is an indication that the attempts are working and that success is near. The efforts should even be more intensive with this sign of near victory.

The phenomenon which causes people to go under without struggle or outcry requires considerable medical investigation before accurate conclusions can be identified. Undoubtedly medical personnel can prescribe some effective actions for individuals who are in this type of trouble. Apparently an involuntary muscle reaction occurs which is not associated with exhaustion or panic but simply with the unexpected ingestion of water either through the respiratory tract or the throat. It occurs often enough, 30% of all drownings, to require a detailed medical analysis as to its source. We admit we are baffled.

In the boating type accidents it is clear that life preservers which are worn, not sat on or stored under the deck, go far to prevent fatalities. Whether you can swim or not makes little difference if you are dumped in the water far from shore. Operation of a boat is fun, but it is not an ability that you are born with. It must be learned as any other mechanical operation. The primary problem in all boating accidents is that the boat capsizes or overturns. The primary reason that the boat capsizes or overturns is because the operator didn't know what he was doing.

We firmly believe that if an individual in a water emergency keeps himself from panic and gets mad - makes his muscles work, and never gives up - he will make it if the situation is makeable.

Finally, drownings we found, are no respector of age or rank. All you have to have is water, and be there. A wonderful time can change to a tragedy in just about two minutes.

Tragic Terminology

An often-quoted phrase heard in the Air Force is "Flying is inherently dangerous". As a general statement, this is acceptable as a truism. We would guess that nowadays the same thing could be said about cars or two-wheeled vehicles. Each year the number of people accidentally killed and/or injured continues to rise.

Most things we do involve a certain amount of risk. Accidents usually happen when we least expect them. Not only will they leap out at us, but what will cause an aircraft accident may be something which we would use everyday and have no reason to suspect as an accident cause. The following conversation between a pilot and Departure Control will illustrate these points:

1747 W-70 Departure Control, Wolf Seven Zero airborne left turn.

DR-2 Wolf Seven Zero, Departure Control radar contact this will be a vector to the Xray intersection.

W-70 Roger Seven Zero.

1748 DR-2 Wolf Seven Zero is one two miles northwest Xray intersection verify after Xray climbing to maintain flight level two three zero.

W-70 Understand Xray at ten thousand or below then climb to two three zero. This is ah Wolf Seven Zero uh, we're coming up on VFR on top now.

DR-2 Wolf Seven Zero roger.

1749 DR-2 Wolf Seven Zero climb and maintain flight level two three zero.

W-70 Wolf Seven Zero climbing to two three zero.

DR-2 Wolf Seven Zero continue heading one two zero for a vector to Johnston maintain flight level two three zero.

DR-2 Wolf Seven Zero did you copy?

1750 W-70 Wolf Seven Zero we have an emergency call Mayday ah we'll be going back to Anderson.

DR-2 Wolf Seven Zero roger for vector back to Anderson turn left heading three zero zero. What is the nature of your problem?

W-70 We're in a right turn and we have a compressor stall.

DR-2 Wolf Seven Zero roger. Can you maintain VFR conditions on top?

W-70 Negative.

DR-2 Wolf Seven Zero roger. What is your altitude now?

W-70 Uh - just hold on now.

DR-2 Okee Doke.

DR-2 Wolf Seven Zero traffic at two o'clock five miles southbound an F one oh correction a T twenty nine out of five thousand. What is your altitude now?

1751 DR-2 Wolf Seven Zero disregard the traffic in your right turn, you'll pass well clear.

DR-2 Wolf Seven Zero request altitude I have airway traffic.

1752 W-70 Departure this is Wolf Seven Zero. I'd like to set up for a straight-in full stop, a straight-in on at Anderson here and - uh - we're at ten thousand feet at the present time.

DR-2 Wolf Seven Zero Departure Control roger understand turn left heading two seven zero, maintain one zero th

sand, we'll set you up for a straight-in approach to runway three four. Over.

W-70 Seven Zero roger. I got the engine running again okay.

DR-2 Wolf Seven Zero roger. Would you like to go straight in to three four or continue on a wide downwind for runway one six?

W-70 Ah, negative, we'd rather land ah - one six.

DR-2 Wolf Seven Zero roger, fly heading three one zero maintain one zero thousand. This will be a vector for precision approach to runway one six.

W-70 Seven Zero.

DR-2 Wolf Seven Zero roger Anderson. Altimeter two niner eight four, the wind one three zero degrees at three, runway one six in use.

1753 W-70 Two niner eight four.

DR-2 Wolf Seven Zero what is your problem now?

W-70 Seven Zero roger I had a compressor stall. I had to shut the engine down. I got it restarted okay.

DR-2 Wolf Seven Zero roger. You're niner miles southeast of the airport on the downwind. We'll have a ten mile final for straight in.

W-70 Seven Zero roger. I just had another compressor stall. Say uh snap vector.

1754 DR-2 Wolf Seven Zero radio check.

DR-2 Wolf Seven Zero Squawk seven seven zero zero.

DR-2 Wolf Seven Zero Anderson Approach Control on guard. The Anderson weather one thousand two hundred scattered two thousand scattered measured ceiling three thousand two hundred broken seven thousand broken visibility two zero.

1755 W-70 This is Wolf Seven Zero. Mayday Mayday we're going to land on one uh the one to the north at - ah - Anderson.

DR-2 Wolf Seven Zero roger. Understand you'll be landing runway three four. Do you have the airport in sight?

W-70 Roger.

DR-2 Wolf Seven Zero roger standby.

DR-2 Wolf Seven Zero, what's your position now in relation to the airport?

W-70 We're on a right base.

DR-2 Wolf Seven Zero roger continue.

DR-2 Wolf Seven Zero cleared to land runway three four - cleared to land runway three four.

1756 DR-2 Wolf Seven Zero the Anderson wind one five zero degrees at three cleared to land runway three four.

The accident was fatal to the aircrew. It is much easier to sit down after the accident and take points one by one, sort out what was done right - also what was done wrong. The pilot and control agencies had a total of eight minutes in which to cope with an inflight emergency while the board has many, many days to do the same thing.

One of the main reasons accident boards are held, of course, is to find out what the primary cause of an accident is. In addition to this, usually many other findings not contributing to the accident are brought to light. These facts may not have contributed to this accident, but they could very easily be responsible for an accident in the future unless they are corrected now.

One of these findings was that the pilot and radar controller were not speaking the same language. When the pilot first encountered his emergency, he asked for a "snap vector" to the base he had just taken off from. From the conversation which followed it became apparent that the word didn't mean anything to the controller. The same thing can be said about the term "compressor stall". This one appeared to be foreign to him also.

When faced with any emergency a pilot will use phrases and terms which are familiar to him. Since he is very busy trying to cope with the problems at hand, the pilot does not have time to analyze whether or not what he is saying makes sense or means the same thing to the controller as it does to him. In this particular case, "snap vector" meant to the pilot that he wanted a direct vector to the closest suitable runway. Since the term didn't mean this to the controller, the pilot overflew an 11,300 foot runway on the way back to his takeoff base.

There is not room here to reprint all the terms both the FAA and Air Force use, but we strongly advise everyone to get their hands on a copy of the FAA's ATC Procedures AT P 7110.1B. This manual contains among other things terminology that the FAA controllers use in air traffic control. Most pilots are familiar with all of our USAF terminology, but unfortunately, since they are not required to use it, the FAA is not familiar with all of the USAF terms. If the words are foreign to some controllers' ears, they cannot be expected to understand and comply with the request expressed in these terms. ★

OPERATIONAL READINESS INSPECTION TEAM

HQ, ADC

BUIC ????

The big question on BUIC is not what it means but what is the purpose and what information is required to support the assigned mission.

Backup Interceptor Control (BUIC) is a backup system for the primary command and control system of Air Defense Command — the SAGE Direction Center.

As such, BUIC (manual or computerized) is designed to assume air defense responsibility in the event of a SAGE failure. Accordingly, the BUIC system needs all information that is available to the SAGE DC in order to conduct air defense for the division. This includes not only the information that SAGE personnel consider pertinent but also information the BUIC battle commander knows is necessary to perform his assigned mission. With this in mind it is easy to see that understanding and cooperation between the two systems is a "must". Key personnel of each system must become familiar with the complete operation of both systems.

What is the answer to this requirement? The first consideration is the establishment of an aggressive cross-training program between the two systems. Cross-training must be accomplished when the entire system is being exercised. Personnel like to observe their own operation during exercises and, of course, no one would expect them to be on TDY during evaluations; however, numerous training exercises, both live and simulated, occur when all personnel are not required and cross-training would be extremely valuable to the system as a whole.

Secondly, procedures must be written to outline individual responsibilities and insure timely flow of required information. A great deal of cooperation is required in order to provide one mutually beneficial document rather than each unit publishing its own procedures that may not be the most effective for all personnel concerned. Emphasis should be placed on transition procedures since this is the most critical period of BUIC operation.

ORIs conducted since the BUIC system became operational indicate a lack of understanding and cooperation between SAGE and BUIC personnel. In short, the "Who is this weenie who's asking all the questions?" attitude seems to be too much in evidence, rather than the "What can I do to make this operation better?" attitude. Let's face it, both the Mode I and Mode III environments are part of the whole division responsibility. They are not separate teams, rather, portions of the same team. The name of the game for any winning team is "Understanding" and "Cooperation" whether it be during exercises or routine daily training.

TIMOTHY I. AHERN
Colonel, USAF
ADC ORI Team Captain


NO NO NO, THIS OLD BUICK IS A SIGHT, BUT THAT BUIC IS A SITE!
YOU'RE SICK
13 FTS
ED CRAIG

DOWN and out

HUNG GEAR (U3A)

Here is an example of how a pilot and copilot combined to use every available source of information at their disposal including a call back to home base to try and fix a right main gear which was halfway down.

The flight was to be a VFR trip from an Air Force Station to an Air Force Base. Upon arrival at the base of intended landing, the pilot started his before landing check. During this check the gear handle was placed in the down position, the pilot observed the gear down light failed to give a gear down indication. He raised the gear, then lowered it once more, and got another unsafe indication. The light bulb in the down light socket was changed to make certain the down light bulb was not burned out. At this time the pilot was given permission to fly past the tower to allow the tower to visually check the gear position. The tower confirmed the unsafe condition stating that the right main gear was about halfway down, or at a 45° angle. During the first extension the pilot said they heard a "loud snap" from the right underside of the aircraft. Next the pilot tried to extend the gear manually with the hand crank. After 40 turns the handle could not be turned further and they did not get a safe indication on the light. During the cranking the crew could hear a "binding noise" on the right side. Again they flew past the tower for another visual check. The right gear was not down completely.

The pilot requested the tower attempt to contact several people in Maintenance to offer suggestions to

overcome their problem. He asked the tower to tell these people that they had tried everything in the Dash One concerning emergency gear extension with negative results.

During the time contact was being established with personnel at the home station, the pilot tried extending the gear manually and had the tower check it again with the same negative results.

After this the aircraft commander decided to return to home base where personnel familiar with the aircraft were located. Enroute he was told to return to the Air Force Base.

Now a telephone patch was completed between personnel at home station, destination Base Ops, and the tower. During the next hour or so information was passed between the home station and the pilot suggesting corrective action to be taken.

Since they had two U3A mechanics aboard it was suggested they remove the flooring in the aircraft and examine the gear extension mechanism which is visible at this point. The pilot said they could see a bent push rod. One of the mechanic passengers tried adjusting the down limit switches. This proved useless and he returned them to approximately the original position.

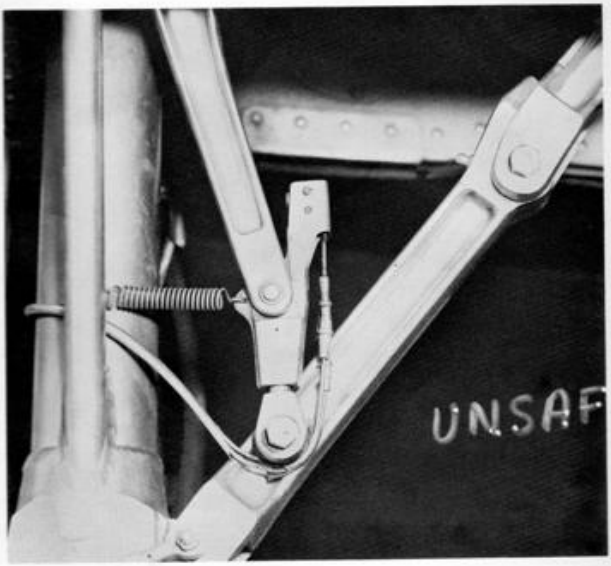
After this the pilot was told to prepare for a gear-up landing at the Air Force Base by burning off fuel from the tip tanks. Disagreeing with this, the pilot said the Dash One says to empty the weight on the one side and maintain the weight on the other side. After emptying the right main and tip, they switched both engines to burn fuel from the left main. Now the aircraft had 25 gallons in the left main so the pilot switched to left tip tank to burn it dry.

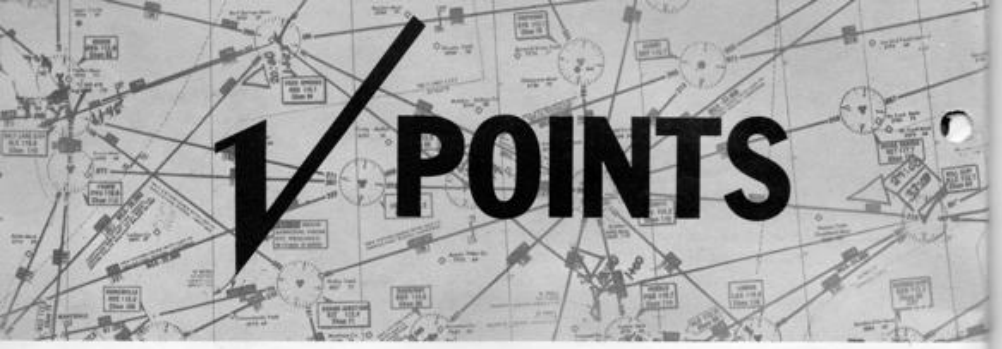
Again the pilot tried an electrical and manual gear extension, flying past the tower each time to confirm right gear position which was partially extended. The pilot was told to make a gear up landing on a foamed runway. The foam strip would be 3,000 feet long. While using up fuel in the left tip tank, the pilot made a high speed pull up to exert "G" forces on the partially extended right gear. No success. On advice from the ground, he tried bouncing the left gear firmly on runway in an attempt to shake the right gear down into locked position. This was unsuccessful.

Next the pilot tried a steep turn while extending the gear with the idea that the gear being intransit, plus the "G" force acting on it, might unjam the linkage. No luck with this try. He then tried a skidding turn to the right with gear extended. Negative results.

With 25 gallons remaining in the left main, the pilot started a normal approach with 30° flaps, 95 mph. Just prior to touchdown, he placed the mixture in off position and closed the fuel oil shut-off valves. The aircraft touched down and slid straight ahead for 1100 feet.

Once in the hangar the gear was cycled several times electrically and manually to try and duplicate the problem found in flight. Only once did the gear fail to go into the down and locked position, but it was noted that each time the gear was extended, it was out of rig, i.e., the required tensions throughout the systems were not maintained. Each time the gear was cycled a scraping grinding noise was heard under the cabin floor boards. The floorboards were removed and the mechanism observed during the cycling procedure. Vertical and lateral play were observed. This is against the requirements in the Dash Two.





V POINTS

This section of the magazine has been designed for you. Be you a headquarters type at any level, a commander, safety officer, pilot - interceptor, transport, light aircraft - radar intercept officer, mechanic, a civilian in industry, weatherman, doctor, designer, or Indian Chief. This is your corner.

We solicit your ideas, items, notes, photographs, sketches, and pictures. The writing should be less than a paragraph - preferably a sentence or two.

We would sincerely appreciate your inputs mailed directly to: The Editor, INTERCEPTOR, Box 46, Ent AFB, Colorado 80912.

DID YOU KNOW THAT

V Your standard pilot's sunglasses transmit only 10-15% of available light. On sunlit days this will not reduce your visual acuity. The glasses should be removed if illumination falls below bright sunlight or acuity will be decreased. This is particularly true at dusk and at dawn. (ADCSG)

V A recently healed nosebleed may recur at altitude due to drying of the nasal mucosa by 100% oxygen. (ADCSG)

V A message from CSAF states that the Directorate of Flight Safety has proposed that sequence flashing approach lights be used on a continuous basis to improve runway resolution during conditions under which lights would normally be off. Appropriate combat exceptions are recognized. Comments on the proposal are requested.

V All you rated airmen who possess private and/or local FAA tickets, remember these certificates expire in two years for private and one year for commercial, and it is your responsibility to inform your flight surgeon office that you wish to renew at the time of your annual physical. Also remember that the FAA has not designated any military flight surgeon as aviation medical examiner for Class I tickets and that these will be obtained from a private physician at the ticket holder's expense. (WGCSG-S)

V Certain misconceptions still exist about when rated personnel are permitted to undergo a flight physical. You may take your annual flying physical within 90 days prior to your birth date. The earlier, the better. (WGCSG-S)

The functional check flight (FCF) insures the quality of maintenance performed and the airworthiness of an aircraft. The FCF if therefore extremely important because of its direct tie-in with quality control, **flight safety,** accident prevention, and above all, mission effectiveness. Commanders should ask themselves:

- Are qualified flight test maintenance officers making FCFs?
- Are FCFs of sufficient duration and in weather conditions that permit full accomplishment of applicable Dash 6 requirements?
- Are excessive operational check flights being performed in lieu of quality FCFs?
- Are FCF work sheets prepared properly?
- Are FCF crews required to receive briefings and critique quality control personnel for each flight?
- Are personnel associated with FCFs familiar with all publications outlining FCF requirements and accomplishments? (TIG BRIEF)

Smoking decreases your visual acuity, particularly in low light intensities, e.g., night vision. (ADCSG)

The lensatic compass can be an accurate and reliable instrument under survival conditions, when properly used. Use this compass for ground navigation to determine a bearing to an objective, to establish your position by taking sights on two or more recognizable landmarks, and to continually check your course of travel. To use this compass, hold as shown in Figure 8-17 sighting your objective through the slit in the top of the rear sight and past the wire in the slot of the cover. Level

Figure 8–17. How to Use a Lensatic Compass

your compass so the dial moves freely when held in sighting position. Without moving the compass, look through the magnifying glass in the rear sight, and read your heading under the fixed line on the glass. All readings on this compass are **magnetic.** The compass can be used to orient a map. Orienting a map consists of making north on the map coincide with true north. To orient your map, lay it out flat, place the compass on it so that the sights are parallel to the north-south grid lines. Next rotate the map and the compass together until the needle coincides with the fixed line on the compass glass. This is a magnetic bearing. To get a true bearing, continue to rotate map and compass until the needle indicates the proper magnetic declination for the area. The map is then oriented and all directions on the map coincide with those on the ground. To determine a bearing, place the center of the compass over your position on the oriented map. A line from the center of the compass to your proposed designation will give you the bearing to follow. (AFM 64-4)

safety officers' FIELD REPORTS

COMPRESSOR STALL, F-102A. Engine began to compressor stall after throttle burst on a function check flight at 35,000 feet indicated. Compressor stall could not be broken by throttle reduction or selection of emergency fuel control. Throttle was stopcocked. Restart accomplished in emergency fuel at 30,000 feet. The engine has been pulled and shipped to the Depot.

FAILED MAIN TIRE, F-101B. Left main tire failed approximately 3,000 feet down runway after landing. Aircraft had made normal landing with 5,000 lbs of fuel on board. Nose gear was still in the air at the time of failure. Tire had a total of 8 points on it at time of failure. Debris from tire was thrown through top skin of left wing at station 100 causing 20 inch by 8 inch hole. Inspection of brakes and anti-skid system revealed no maintenance or material deficiency. Suspected cause factor - pilot technique in that he inadvertently activated the brakes during initial landing roll.

FUEL GAUGE, F-106A. Aircraft was at 45,000 feet when pilot noticed that his fuel quantity indicated 1000 lbs instead of 3500 lbs. The right side read 300 lbs and the left side and forward tanks read 800 each. Three or four minutes later, total quantity read 0, right 0, left 15, and forward 10. When passing through 15,000 feet on the descent, the fuel quantity returned to normal. A broken wire to the fuel quantity indicator was found and replaced.

DRAG CHUTE FAILURE, F-106A. Drag chute failed to deploy on landing. Investigation revealed that improper setting of the 30 degree limit switch prevented activation of the chute deployment system.

OIL PRESSURE, F-101F. Engine shut down in flight. During climb out the left engine oil pressure began to fluctuate between 10 and 50 psi. The engine was shut down and restarted on final. Landed with no further problems. The oil pressure relief valve and oil pressure transmitter were found defective and were removed and replaced.

DRAGCHUTE FAILURE, F-101B. Dragchute door did not open when the pilot pulled the dragchute handle. The parachute personnel install a thin cloth tab on each dragchute which shows outside the dragchute compartment when installed, indicating to the pilot that a dragchute is installed. The tab was missing when the chute arrived on the flight line, so a crew chief attached a piece of cloth which was too thick and caused the door to bind. Repacking personnel have been instructed to insure proper installation of tabs. Flight line personnel have been instructed to reject chutes without proper tabs. Dragchute was packed and installed at Kingsley Field.

EMERGENCY LANDING, B-57A. Shortly after level-off the No. 2 engine exhaust gas temperature gauge began fluctuating between 450°C and 510°C with all other engine instruments indicating normal readings. An uneventful landing was accomplished. The problem was found to be a defective EGT indicator which was replaced with a like item. Subsequent flights have been flown OK.

HYDRAULIC FAILURE, F-102A. A secondary hydraulic failure was experienced on mission recovery. Aircraft landed with no further problems. Male quick disconnect on hydraulic suction line in engine compartment failed. Failure indicated possible overtorque or at one time on engine removal this line had been left attached until bending occurred and then was removed.

AFTERBURNER PIGTAIL FIRE, F-102A. This fire was experienced during takeoff, but fire went out as soon as the pilot shut afterburner off after receiving radio calls from tower and Mobile Control. A closed pattern was flown and an immediate landing made. One tube assembly, afterburner manifold to spray nozzle, was cracked and another one was loose as a result of silver solder melting. The shroud contained the fire and therefore no damage to airframe occurred.

NOSE GEAR, T-33A. The nose gear would not retract after takeoff. After a low approach, mobile reported the nose gear was cocked about 20°. The runway was wet and foam was not used for landing. Touchdown and roll-out were normal with the nose wheel straightening shortly after touchdown. Investigation showed the cylinder attachment to the shimmy damper was not properly torqued, causing the metal crush washer to leak fluid. All spare and installed dampers were checked for proper torque and all maintenance personnel were briefed on this occurrence.

THE WAY THE BALL Bounces

ACCIDENT RATE

1 JAN. THRU 30 JUNE 1967

	ADC	ANG
Thru June 1967	3.8	4.8

MAJOR — ALL AIRCRAFT

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
65	456 FIS	36	87 FIS	73	119 Ftr Gp
45	62 FIS	35	444 FIS	53	162 Ftr Gp
38	48 FIS	29	414 Ftr Gp	41	112 Ftr Gp 132 Ftr Gp 141 Ftr Gp
36	4600 AB Wg	27	18 FIS		

ACCIDENT FREE

BOX SCORE

ACCIDENTS FOR JUNE	1st AF	4th AF	10th AF	14th AF	4600	ANG
CONV						
T-33						
F-100						
F-101						
F TF-102						
F-104						
F-106						
B-57						
F-89						
EC-121						

MINOR ACCIDENTS THIS PERIOD — 1

CUMULATIVE RATE

1 JAN. THRU 30 JUNE 1967

	ADC	ANG
JET	4.7	5.2
CONVENTIONAL	1.6	0

BY AIRCRAFT

	ADC	ANG
T-33	3	0
F-89		0
F-100	64	
F-101	5	
F TF-102	6	7
F-104	24	
F-106	3	
B-57	0	
EC-121	3	

RATE = MAJOR ACCIDENTS PER 100,000 FLYING HOURS

we point with

1/LT. RODNEY C. ORRISON
25 Air Div, McChord AFB, Wash

PRIDE

NO DIRECTOR ERROR

First Lieutenant Orrison, an Instructor Director, was monitoring a trainee Intercept Director during a complex Air Defense training mission. The mission was composed of two parts: high altitude intercepts, followed by low altitude intercepts. Five F-102s were under their control. Two were used as targets and the other three were interceptors; a flight of two and a single aircraft. Under the supervision and monitoring of Lieutenant Orrison, the trainee completed the first part of the mission and descended the aircraft to begin the second part

Just as the second part started, the single aircraft declared an emergency for AC/DC power failure.

Lieutenant Orrison immediately took control of the mission and vectored the aircraft with the emergency toward home base. He joined the number two aircraft of the flight of two up with the emergency aircraft and cleared the two targets and remaining interceptor to Air Route Traffic Control Center (ARTCC) for recovery. The pilot of the emergency aircraft was having difficulty maintaining radio contact and, with the approval of ARTCC, elected to remain on Lieutenant Orrison's frequency rather than change to an ARTCC frequency.

Lieutenant Orrison cleared the approach to home base with ARTCC and held an open line to Radar Approach Control (RAPCON) so that they could clear traffic for the emergency aircraft. He then gave the emergency aircraft voice control into home base. Shortly after reporting that he had the field in sight, the pilot lost radio contact, but, because of Lieutenant Orrison's foresight in coordinating with RAPCON, the way was clear for a straight-in approach and the aircraft landed safely.

Lieutenant Orrison's thorough knowledge of the local flying area, his professional ability and his rapid and positive actions helped to avert a major accident. His skill and judgment made it possible for him to cope with a difficult situation and to return an aircraft in distress to home base through ARTCC controlled airspace while handing off other aircraft to ARTCC for recovery.

This professionalism and skill make Lieutenant Orrison worthy of the "We Point with Pride" awa

AFTER BURNING

Address your letters to: The Editor, INTERCEPTOR, Box 46, Ent AFB 12, Colo., 80912
To be published, your letters must be signed,
but names will be withheld upon request.

FOR SCOPE DOPES

In reply to your request via "Hot Line" in May INTERCEPTOR, the following is submitted:

I feel it's only fair to share this goodie with my fellow scope dopes even though it is cheating a tad.

Usually when you are given a set of birds and assigned a STOP, you race right out on top of it, set up a race track, figure "8", etc., and rest on your laurels until you get a commitment. This may be the school solution, however a sharp scopie and a couple alert jocks can speed up the process by nailing those fakers before they can get a good start. A lot depends on your location, but this technique works best where it's needed most as the briny blue makes an excellent radar background.

I experimented and developed this technique while stationed at Mt. Laguna AFS, California, using F4Bs out of Miramar NAS. To set the scene, I could see the fakers going out to IP which was beyond radar coverage. I knew they would penetrate eventually, but "where" was the problem. Instead of racing out to STOP I told my jocks to crank up their Aero IA in the search mode, set up a weave pattern making all turns to seaward toward my STOP which was about 50 NM farther out. I told them to call off all contacts and their heading at time of contact. With my UPA35 cursor centered over the reporting jock, I could plot the incoming raid with some degree of accuracy. Once I had established a valid raid and provided I could get a "Hunch Commit" approved by the WAO, I usually was successful in getting a "Judy" before the faker was known to the system. Sometimes to increase my odds I would separate my birds laterally up to 20 NM and vertically as much as 15 M.

Give it a try, it may work. If it doesn't you haven't lost anything, but if it does, those jocks will feel like a triple threat star if they can pull it off just once!

CWO Robert E. Puthuff
31 Air Division
Oklahoma City AFS, Okla

***We now know of one person who reads the Hot Line section of our magazine. Thanks for the comments.**

"THE WILL TO LIVE"

In my capacity as Command Flight Safety Officer, the Commander, Far East Air Force (Air Marshal Sir Rochford Hughes) recently passed to me a photostat copy of an article he had been given by Brigadier-General William W. Spruance of the Delaware Air National Guard. The Commander thought we could make good use of it in our own theatre of operation.

You may remember that you printed the article (concerning the General's near-fatal crash in a T33) in an issue of INTERCEPTOR some time ago. With your permission I should like to republish the article in the next issue of the FEAF Flight Safety Review "Eastword". If you can agree to this, perhaps you would also be kind enough to send me either original photographs of the burned limbs which accompanied the article or an original copy of the magazine as the photostat copy I have cannot be reproduced satisfactorily.

W/C C. C. Povey
Headquarters Far East Air Force
Royal Air Force
Changi, GPO Singapore

***We are happy to furnish the material you requested. As for the original photographs of the burned limbs, we are sorry that we no longer have them. Hope the magazine copies will serve your purpose. Please let us know if we can be of further assistance. Best wishes for a continuing Safe Flying Program.**

A FAN

I have been following your magazine for some time and have certainly enjoyed the pictures, especially of the wrecked airplanes. If possible, I would like to subscribe.

Bruce E. Furbish
Aluminum Scrap Metals and
General Junk Co.
West River Road, Montana

***Sorry, but our pictures can't be used for advertising.**

the Cold Hard Facts..

Fffective survival knowledge is life insurance for the aircrew member. Here's a good tip from AFM 64-5.

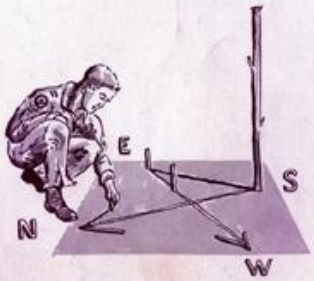
DIRECTION BY THE OWENDOFF SHADOW TIP METHOD*

This is a simple technique for determining direction. Accuracy varies depending on latitude and time of day. Early morning and late evening readings are least accurate, readings close to local apparent noon most accurate. Furthermore, the readings will be less accurate the farther you are from the equator, particularly during early and late hours. This technique will give you general direction in a short time whenever the sun casts a shadow, and is, therefore, very useful. If readings are taken throughout the day, the errors will cancel each other, thus enabling you to stay "on course."

STEP 1

STEP 1: Drive a stake vertically into the earth in a flat, clean spot where the sun shines brightly. Mark the tip of the stick's shadow with a small peg.

STEP 2: Wait about 15 minutes and peg the tip of the shadow again. Draw and extend a straight line that connects the two pegs. This line runs east and west.



STEP 3: Draw a line from the stake intersecting the east-west line at right angles. Mark an arrow point at the end of this line. The point indicates north in the Northern Hemisphere and south in the Southern Hemisphere.

DIRECTION FINDING