FLIGHT COMMENT

JULY • AUGUST • 1971

Blue Four — page 1

Comments

There have been several occasions this year where minor instrument, aural or physical indications have been the symptoms of very critical problems. Fortunately, the majority of these occurrences have not resulted in a loss of life or destruction of the aircraft. However, they indicate the risk involved in continuing the flight after any indications are experienced which could even remotely be suspected as having serious consequences.

A recent ejection incident (in another air force) brought out a potential man-seat-chute involvement. The pilot had loosely adjusted the cuffs to permit turning up the cuffs of his flying suit. When he squeezed the ejection seat trigger, he caught the loose portion of the sleeve in the tip of the trigger, effectively locking the seat to his arm. When the chute deployed, the seat ripped the cuff from the flying suit and injured the pilot's arm. In addition, seat paint marks were found on the shroud lines. -F5 Service News.

Flight Safety Foundation Bulletin carried a suggestion recently that if wheel revolutions are measured to determine distance, why not RPM to determine ground speed? With airspeed indicators notoriously inaccurate at low speeds, a ground speedometer would be mighty handy when charging onto a high-speed turn-off.

The Murphymonger featured in the Birdwatchers' Corner, first appeared in Flight Comment in 1967. A review of our statistics shows that its message bears repeating.

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COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

MAJ J. G. JOY
Education and analysis

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For longer than I care to admit, I have wanted to expound on the subject of giving more help to the man at the end of the line: the *doer*. Well, I procrastinated long enough and Colonel Beisner, Chief of Safety of USAF Tactical Air Command, expressed it so well in his February 1971 editorial that I obtained his permission to reprint "What have YOU done for Blue Four today?"

COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

What have YOU done for Blue Four today?

GERALD J. BEISNER
Colonel, USAF
Chief of Safety

We are currently enjoying a favourable trend in the reduction of accident rates in all functional areas. Obviously, we would like to continue this trend. Some hold that the better you get, the harder it is to get better. I don't think so. I believe there is more merit in saying, "Now that we have the upper hand - let's really get moving".

There are several reasons why we can get better in the accident prevention field. First of all, we spend a great deal of time in early, post-accident reaction, and after-the-fact reporting. While this effort may prevent recurrence temporarily, it doesn't do a thing for prevention of the first time occurrence. If follows then, that the fewer accidents we have, the more time we have for pure, before-the-fact accident prevention.

In place of merely reacting to accidents, we are now afforded the opportunity to place more emphasis on initiating action of prevent that first time occurrence. We can do our reacting to incidents, not accidents, since we do usually get tipped off before the big bash. The accidents will take care of themselves when they occur, let's spend our time constructively... in the prevention part of safety.

Along these lines, let's take a look at where our accidents are happening. We don't have any aircraft accidents here in the headquarters... and we don't sweat low ceilings on the way to work. The accidents happen where the hardware is...in the world of "Blue Four".

"Blue Four", in my book, is the hypothetical young fighter pilot, transport jock, crew chief, or armament tech. He's right at the end of the

line, the tail of the formation, the "last to know and first to go". He catches everything that flows downhill, and has to find a place to put it in that little five pound bag. He's never heard of the Air Force Register and didn't even make a bet on the next Air Force Chief of Staff. He complains about everything that's not right and wonders why "they" don't do something about it. But he wouldn't fill out an AFTO 847 (Recommendation for a Change of Publication) or EUMR (Emergency Unsatisfactory Maintenance Report) if his life depended upon it (and sometimes it does).

All the same, "Blue Four" is the guy in the arena. Let him miss one item on the checklist, blow the tool count, or get caught taking just one shortcut to get the mission accomplished, and he's the one who "gets it". You see, everyone is covered...except "Ole Blue".

If anyone is the backbone of TAC, it's "Blue Four". He can do more with less, he is an innovator, he IS our Strike Force. We owe it to "Blue Four" to give him all the help we can. Make life easier for him and he'll hack the mission without wrecking nearly so many airplanes and vehicles. We were all "Blue Four" at one time...some of us forget. It's understandable, but not necessary.

Where do we start? First of all, try reading the incident reports - we actually advertise our coming accidents...isn't that interesting? And then there is your daily contact with "Blue Four" and his equipment. And how about the hazards we put in his path?

The daily message traffic is your chance to shine. People all over the world, flying the same equipment as you are, are telling you about all the "near accidents" they have experienced. The information is current and it's useful...if it gets a little more than a cursory glance. Things we begin to take for granted, such as the availability of a barrier on the approach end are set-ups for an accident in the future. And we'll have them if the cause of the approach end arrestment isn't solved.

And how about the hardware "Blue Four" uses each day? He looks at an unreliable attitude indicator - and when it fails he must perform a maneuver which may make him completely disoriented just to switch to his standby equipment. We give him a new aircraft and install the radio as we did in the F-86, twenty years ago. He still needs three hands...or he sits on the wing, in weather, waiting for a chance to make the frequency change his leader made two minutes ago. Or, he's smoking down the runway trying to abort and just can't find that hook button in the dark. This area is indeed a fertile field.

Why should we be surprised when "Blue Four" fires a round from an "empty" gun during his sixteenth hour of duty? Why should "Ole Blue" run into that pole two times before you take it down? Seems there's a law against hitting it - no law against putting it in his way.

"Ole Blue" is in the arena - he's a doer. Let's help him do his job better and more efficiently. If you can't get that light in the tailhook button the first time, try it sixteen times. Put yourself in his place - would you like to have that "life-saving" button lit when you hurl yourself down a dark avenue of concrete in the dead of night...you bet you would. WHAT HAVE YOU DONE FOR BLUE FOUR TODAY????

Courtesy TAC ATTACK.

Award for TSR Originator

Prior to the closing of CFB Gimli, the Base Commander, Col Dunlop, presented an award to Maj G.H. Shorey, the Staff Officer Flight Safety at Training Command Headquarters, in recognition of his achievement in fostering a Transient Servicing Program.

Maj Shorey began working on this project in 1969, at a time when lack of funds and personnel was forcing bases to cut back the services normally available to transients. As the reductions reached serious proportions, to the point where he felt that it was creating an accident potential, Maj Shorey began positive steps to reverse the trend. The result is the successful TSR Program in Training Command today.

Cockpit Temperature -40°C!

Slightly lower than normal cabin heater output was experienced when the Argus started up at Fort Smith, but the output temperature rose to 70°C after takeoff, enough for adequate cabin comfort. As lower temperatures were met during the flight, the heater output fell to between 50 and 30 degrees. The crew prepared their Arctic clothing and discussed the possibility of cancelling the flight. However, although the cabin was cold, they decided that it was still comfortable enough to continue.

As the cabin temperature fell to the thirty-degree range, ice began forming on the inside of the aircraft and then the cabin heat failed altogether, dropping the temperature rapidly to near the outside air temperature of minus 40°C. A decision was made to land at the nearest airport. For several reasons, this turned out to be Namao, *three hours away*.

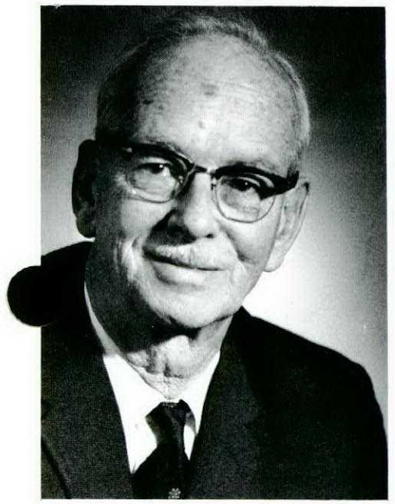
The incident message tells the rest of the story: "All attempts by the flight engineer to restart the heater failed; wing and tail heaters were working normally. The ventilating air shut-off valve was closed in an attempt to decrease the entrance of cold air and a descent to 500 feet was carried out in hopes that this would assist in re-starting the heater. The heater valves and controls were reset, but to no avail.

"The crew donned their arctic gear to prevent frostbite. The stove and oven were operated continuously as were all other heat producing systems, with crewmembers taking turns at the heat. Coffee froze in cups before it could be consumed, hot roast turkey likewise. The pilot warmed his hands over the stove then donned the standard wool and leather flying gloves for the approach into Namao, but in less than ten minutes of manual flying he complained of painfully cold hands. During the approach the flight engineer again tried to restart the cabin heater and was finally successful in getting an output temperature of 50°C. An overshoot was carried out and the pilot held in the local area while the heater was monitored. As it now appeared to be working, the crew decided to proceed to home base at Comox. Approaching the sunshine coast, with outside temperature increasing, the heater output improved further and was working normally by the time the aircraft reached Comox.

"Some crewmembers later reported itching and peeling skin, indicating that a certain degree of frostbite had occurred."

Crews have been advised to monitor heaters closely and to abort sorties where a partial malfunction is apparent and extreme cold is forecast. A squadron UCR for a secondary supply of cabin heat is receiving priority action.

Citation



The Laura Taber Barbour Award for 1971 in recognition of noteable achievement in the field of Aviation safety has been awarded to Mr. M.S. Kuhring. Mr. Kuhring, as a member of the Associate Committee on Bird Hazards to Aircraft, has worked closely with the Canadian Forces and DFS over the years.

The citation reads: "for his contributions to aviation safety while serving as Chairman of the National Research Council of Canada Associate Committee on Bird Hazards to Aircraft since its formation in December 1962. Mr. Kuhring has, through his leadership, enthusiasm and drive enable the Committee to formulate many recommendations which have led to a reduction in the number of aircraft accidents due to bird strikes.

Through Mr. Kuhring's energetic leadership and world-wide visits and discussions he has resolved and focused the diverse interests and viewpoints of his committee on the manifold aspects of the bird hazard problem. This continuing effort and the variety of research and development programs stemming therefrom hold the promise of still further reduction in the numbers of serious accidents caused by bird impacts with aircraft."

On the Dials

In our travels we're often faced with "Hey you're an ICP, what about such-and-such?" "Usually, these questions cannot be answered out of hand; if it were that easy the question wouldn't have been asked in the first place. Questions, suggestions, or rebuttals will be happily entertained and if not answered in print we shall attempt to give a personal answer. Please direct any communication to: Base Commander CFB Winnipeg, Westwin, Man. Attn: ICPS.

DECISION HEIGHTS

With the introduction of GPH 209 (Manual of Criteria for Instrument Approach Procedures), the terms Decision Height (DH) and Minimum Descent Altitude (MDA) replaced the term minimum altitude. This has prompted many questions which this article attempts to answer.

Minimum Descent Altitude (MDA) is "the lowest altitude, in feet above mean sea level, to which descent is authorized in procedures not using an electronic glide path. An aircraft should not manoeuvre below the MDA until the runway environment is in sight, and the aircraft is in position to descend for a normal landing".

Decision Height (DH) is "an altitude, specified in feet above MSL at which a missed approach must be initiated if the required visual reference to continue the approach to land has not been established. This term applies where an electronic glide path provides the references for descent, as in ILS or PAR, and the specified height is referenced to the elevation of the threshold of the runway served".

Unlike the old minimum altitude concept, DH applies only to precision* approaches; it corrects for any difference between the published field elevation and the elevation of the runway threshold. DH is the glide slope reference point from which the pilot either lands visually or commences a missed approach.

The question most commonly asked concerns DH and the Missed Approach:

Q —— Is it acceptable for an aircraft to descend below DH while initiating a missed approach?

A —— If a missed approach is initiated at the DH, the aircraft will undoubtedly descend slightly below the DH during the transition to the climb. This is to be expected and was considered when the DH concept was established. The DH is not an altitude to be 'bounced off' rather it provides a safe decision point where the pilot will make the decision to land visually or execute a missed approach.

The preceding question points to a weakness in many of our training and testing practices. Frequently, stress is placed on the wrong items. Instead of emphasizing the importance of correct decisions, proper missed approach attitudes, and timely power applications at DH, an unrealistic significance is attached to the altitude loss in the transition. Flight examiners have failed pilots for normal variations below a DH while transitioning to a missed approach. Some pilots, to ensure that the DH is not violated, increase airspeed and power early. They climb above the desired glide slope and do not reach DH at the proper distance from the runway, resulting in long touchdowns, excessive landing rolls, or sink problems associated with idle-power dives for the end of the runway.

The transition from an instrument approach to a visual landing is enough of a challenge without further complications. If a pilot is taught to be high on airspeed at DH, to reduce his rate of descent before DH, or to be "decision height shy" he may be unable to land his aircraft safely.

Continually practicing instrument approaches with the prior intent of making a missed approach at DH can also result in poor habits. Practice instrument approaches should be planned as if a landing were intended. Missed approach decisions should not be made until DH is reached.

The emphasis should be placed where it belongs. Recognition of visual cues to the runway in use, airspeed and attitude control, recognition of minimums and the correct missed approach or landing decisions are the real areas of concern.

The next question follows logically:

Q —— How far below DH can an aircraft be allowed to descend during the missed approach transition?

A —— An exact answer for all aircraft is impossible. Most aircraft will make the transition with a minimum of altitude loss. However, the altitude required varies with airspeed, glide slope angle, weight, power response and pilot skill. If your aircraft cannot establish a climb within the limits of the approach and missed approach obstacle clearance surfaces (OCS) you should use a higher DH. The published DH is the lowest authorized. Some Commands may require one that is higher.

In summary, treat DH as it is intended. Know your aircraft and fly to the DH on the glide slope with the correct airspeed, attitude and rate of descent for a normal landing.

*Precision and non-precision are used to differentiate between navigational facilities which provide both azimuth and electronic glide path guidance to a runway (precision) and those which do not. The term Non-Precision refers to facilities without a glide path, and does not imply an unacceptable quality of course guidance.

Helicopter Rescue Limitations

This article is directed to individuals with little knowledge of helicopter limitations. The helicopter is a very versatile machine but it too has its shortcomings. It is necessary, therefore, that all of you potential helicopter rescuees be aware of its limitations. Don't be lulled into a false sense of security. The helicopter cannot always get you out of a tight spot.

Daylight, at-sea rescues can normally be effected with little difficulty. However, when you consider high sea states, high winds, survivor fatigue/shock/incapacitation, surface fires or parachute complications, the picture can change rapidly. When an already fatigued (probably in shock) individual has to fight high seas/winds, the need for good flotation equipment becomes absolutely necessary. The helicopter rotor downwash and noise could be frightening and certainly don't contribute constructively to the rescue attempt. The helicopter may have a qualified rescue crewman aboard in a wet suit to enter the water and help the survivor; then again it may not. Surface fires certainly need no explanation and attempting to pick up a survivor in a chute is taboo due to the drag of the chute and the hazard of the parachute to the helo itself (being sucked into the rotors).

Night, at-sea rescues can have all of the above elements plus disorientation of the survivor, and to a lesser extent the crew, due to the darkness. From the helicopter pilot's standpoint the night, at-sea rescue is much more difficult than daytime rescue operations. The transit to the SAR area may be under low level actual instrument flight conditions (depending on the amount of light and the weather). The search phase will require at least one pilot flying by instruments with the attention of the other pilot split between assisting the controlling pilot and visual search for the survivor. Night detection of survivors generally requires that the person being rescued have a source of light upon his person.

Location of the survivor does not assure rescue at night under certain adverse conditions. Hovering under instrument conditions requires a functioning automatic approach device and a crew that is proficient in its operation. The weather and available light will dictate whether a manual visual hover can be maintained. During an automatic approach the helicopter's altitude and/or airspeed are automatically controlled using a radar altimeter and doppler sensors, respectively.

The helicopter's speed and range are restricted when compared to high-speed fixed-wing aircraft and the survivor may be too far away, or at best the distance may require a prolonged flight for the helicopter to reach the scene.

Day, land rescues are normally accomplished with relative ease. However, limitations are often imposed by the environment. Weather, wind or icing conditions may severely limit or preclude a rescue attempt.

Density altitude, high temperature and gross weight are other factors affecting helicopters in hovering for pickup. Most helicopters currently in use can hover at sea level in extreme temperatures but combinations of high temperature and high humidity or terrain elevation may preclude hovering. At extreme altitudes the helicopter will have difficulty hovering any time and may be unable to do so at all. In view of the helicopter capabilities and limitations noted, it is always best to be in the lowest and flattest spot available, so that the helicopter can approach, land and take off into the wind. This also aids the pilot in being able to see the person being rescued, especially under marginal visibility conditions. It may enable the helicopter to hover from the creation of ground effect or make a landing in spite of the higher altitude due to terrain elevation.

Night, overland rescue attempts will have many or all of the restrictions discussed above plus the problem of terrain avoidance and is therefore a most hazardous operation.

The helicopter is a versatile machine. Its weak points under extreme conditions have been pointed out. You, as a survivor, may only have to step into a helicopter and take a short ride home. Then again, the situation may be quite different. As a survivor, you should have a basic knowledge of your rescue vehicle and its capabilities and limitations. It may save your life.

U.S. Navy Safety Center Weekly Summary

A Big Letdown

Sergeant Pete Morin of CFB Portage La Prairie reached a milestone recently with the completion of his 20,000th letdown. Sergeant Morin joined the Air Force at Victoria in 1952. His subsequent tours have included Gimli, Comox, Goose Bay and Edmonton. He arrived at Portage in 1969.

USAF exchange officer Captain Guy Childress, the pilot of the aircraft, congratulating Sgt Morin. Looking on (right) is Sgt Rick Ritchie who monitored Sgt Morin's first approach 16 years ago.

Good Show


Maj R.W. Patrick


Capt D.L. Thomas and Lt. J.A.V. Roeding

SGT P. SCHAFLER

Sgt Schafler was the duty Radar Controller on the night of 25 Feb 71, when a German light aircraft with three persons on board, enroute from Spain to Mannheim, Germany, became totally lost in the Soellingen area. When Lahr Approach was unable to locate the aircraft, Soellingen Tower obtained a radio bearing of 350° and simultaneously Sgt Schafler acquired a radar contact on a bearing of 350°, range 11 nautical miles. The pilot informed Sgt Schafler that he was at 7500 feet, flying above an undercast and had only 5 minutes fuel remaining. He was not an instrument rated pilot, and to compound the already critical situation, he then became flustered and lost his command of English. Sgt Schafler, realizing the precarious situation and the futility of issuing control instructions in English, immediately commenced instructions in German. Through his self-taught German, his reassuring voice, his alertness and control capabilities, Sgt Schafler vectored the aircraft through cloud to a safe landing.

By his resourcefulness and his professional response to the situation, Sgt Schafler averted a crash landing and possible injury or death to the aircraft occupants.

MAJ R.W. PATRICK

Maj Patrick was airborne on a student training mission. At 10,000 feet AGL, five miles from Base, he intentionally flamed out the aircraft engine for a practice relight as required by the T33 training syllabus. His student in the front seat attempted the relight but without success. After allowing the student a second relight attempt, Maj Patrick took control and set the aircraft up for a forced landing, at the same time declaring an emergency. Then, using the check list, he tried two more relights from the back seat, but his attempts were unsuccessful. The subsequent forced landing pattern was flown perfectly and the aircraft landed safely on the runway.

Maj Patrick handled this emergency with precision and good judgement. He demonstrated to his student - under actual conditions - the high standard of professional competence required of Canadian Forces pilots.

LT. J.A.V. ROEDING AND CAPT D.L. THOMAS

Lt Roeding and Capt Thomas had taken off from Moose Jaw in a Tutor for a staff mutual mission. Climbing through 3000 ft they detected a loss of one percent RPM and a slight odour of oil. Through 7000 MSL they observed a further loss of one percent RPM, but the oil odour was no longer apparent. At this time they decided to abort the mission and return to Base. They called tower requesting landing instructions for a PFL, and shortly after observed a further loss of three percent RPM. By now they were seven miles south east of Base at 9000 MSL and Lt Roeding, the aircraft captain, reduced power to the setting required for a PFL. When he moved the throttle the engine immediately flamed out.

Lt Roeding attempted a number 1 relight but was unsuccessful. He then declared an emergency and concentrated on flying the aircraft while Capt Thomas continued with a number 2 relight. When the number 2 relight procedure also failed, Capt Thomas performed the forced landing check. Lt Roeding flew the forced landing pattern and landed safely on the runway in spite of a strong cross wind.

This aircraft was saved by the actions of these pilots, based on several pieces of apparently insignificant evidence. The loss of a percent or so of RPM by itself, although unusual, would not normally be sufficient evidence to abort a mission. A slight smell of oil is not particularly uncommon since from time to time different odours emanate from the air-conditioning system and in any event the smell disappeared after a short period of time. The third rather isolated incident was the loss of yet another percent at about 9000 feet. Several happenings, individually not warranting cancellation of a mission, were collated by the pilots who then arrived at the decision to immediately return to Base. Had the decision not been made at that time, in all probability the pilots would have been beyond gliding distance to Base.

The action of these two pilots in analyzing their situation and making the decision to return to Base is a fine example of outstanding airmanship and crew co-operation at its best.

CPL L.W. COVYEOW

During a Daily Inspection on a CUH-1H helicopter, Cpl Covyeow discovered a small crack in the swaging of the end fitting on the control cable for the tail rotor. When he removed the cable and examined it more closely he found another crack on the opposite side of the fitting.

The location of the cable makes it very difficult to examine thoroughly. Cpl Covyeow displayed initiative and keen observation in discovering this defect and possibly averting an accident.


Cpl L.W. Covyeow


Cpl D.A. Moore


L. to R. Cpl Ash, MCpl Magas, Cpl Moxin, Sgt Turpin


Cpl A.R. MacDonald


MCpl J.K. Burbridge

CPL D.A. MOORE

Cpl Moore was conducting a B check on a Dakota. The aircraft had just been released from Snags after undergoing repairs to a fuel induction pipe. When he had completed the standard itemized check, Cpl Moore positioned a stand under the engine and proceeded to inspect the engine and cowling area with a flashlight. During the check he noticed a green fuel stain on the cowling, but the location of the stain seemed to rule out an induction pipe leak as its source. He then intensified his examination and discovered a hairline crack extending through the fins to the cylinder and on to the spark plug.

Cpl Moore displayed a high degree of professionalism by his initiative in performing more than a routine inspection and in his analysis of the factors which could cause a fuel stain. In so doing he removed a potential flight hazard.

SGT H.F. TURPIN AND CREW

Sgt Turpin's repair crew, consisting of MCpl Magas, Cpl Ash and Cpl Moxin, were assigned to track down a fuel system problem which on two occasions had caused large fluctuations in Torque, Turbine Inlet Temperature and Fuel Flow on the number one engine of a Hercules. Each time, the fluctuations had happened just at liftoff.

Following a thorough briefing by the crew of the aircraft, the four NCOs set to work. Ten uninterrupted hours later, during which they had applied all known procedures for fuel system faults, they were still not satisfied that the problem had been solved. But they were able to establish that the problem was centred in the fuel heater. After a comprehensive write-up of their progress, the crew turned the job over to the next shift.

To satisfy himself that the next crew would thoroughly understand the problem, Sgt Turpin returned to the job later and suggested that the fuel heater be removed and inspected. This was a step beyond that published in the Engineering Orders for fuel system snags. When the fuel heater was removed large quantities of polyurethane flakes were found blocking the inlet ports. A subsequent special inspection (SI) of the fleet uncovered fuel heaters contaminated with varying quantities of polyurethane flakes in other Hercules aircraft.

These NCOs distinguished themselves by their persistence and by insisting on exploring an area which had been overlooked in the past. Misled by earlier information, most tradesmen had been satisfied with inspecting the filter screens of the fuel heater. They were largely unaware of the reverse make-up of this component whereby the screen follows rather than precedes the radiator. In this case it was the radiator that was clogging. Sgt Turpin and his crew prevented this problem from developing further and possibly causing an engine failure.

CPL A.R. MACDONALD

During a periodic inspection of a T33, Cpl MacDonald noticed slight hydraulic fluid seepage in the mid-fuselage area. A further investigation in the speed-brake well revealed that the landing gear emergency down line was wet with hydraulic fluid. For a more thorough investigation he had to remove the Cabin Pressure Turbine Unit.

Cpl MacDonald went well beyond the specified requirements in conducting this inspection and tracing the fluid to a severely corroded hydraulic line. His investigation led to the finding of a similar condition in other T33 aircraft and to the development of a rectification which eliminated a serious flight hazard.

MCPL J.K. BURBRIDGE

During a Periodic Inspection on a Hercules, MCpl Burbridge was assigned the task of checking the throttle quadrant. After inspection, all four condition levers correctly went into detent at the ground idle position. This portion of the check could then have been signed off as serviceable, however, because Number 3 lever presented an abnormal feel to MCpl Burbridge, he decided to remove the access panels and carry out a detailed inspection. This revealed a cracked tang on the detent spring. Continued use of the lever under these circumstances would have eventually caused the spring to become lodged in the controls and thus render the lever inoperative.

MCpl Burbridge prevented the development of a possible in-flight emergency by the extra effort he put into his inspection.

Good Show

CPL N. FALL

Cpl Fall was performing the Serviceability Assurance Check (SAC) on a Voodoo during a night exercise. In the course of the check he noticed damaged metal around the inside bearing of the left nose wheel. He then discovered that the bearing had completely disintegrated.

The nose wheel bearing is not an item on this inspection and furthermore, there was no indication on this aircraft, written or otherwise, to lead Cpl Fall to suspect the condition of the nose wheel bearing. The fortunate discovery was a direct result of thoroughness on his part. By this thoroughness, in spite of the fact that the aircraft was urgently required in the ADC exercise, Cpl Fall averted a serious flight hazard.

PTE R.G. BRATTON

While changing a rudder servo on a CF104, Pte Bratton noticed what appeared to be a small cut in a hydraulic pressure line. Further investigation revealed that the hydraulic line was cut around the full circumference at the inboard end of the sleeve to a depth of one half the wall thickness. The hydraulic line was original aircraft equipment and had probably been damaged during manufacture.

By his alertness and attention to detail, Pte Bratton detected a long standing defect that could have resulted in an in-flight control malfunction and possibly an accident.

Pte R.G. Bratton

Cpl N. Fall

Cpl M.S. Hooley

CPL M.S. HOOLEY

Cpl Hooley was the ground technician assigned to start an Argus. As the first engine was being started he heard an unusual swishing noise emanating from the engine. He immediately signalled for the start to be discontinued. Investigation of the engine revealed that the exhaust clamp on number ten cylinder was missing and indications of burning were evident in the adjacent cylinder and in the baffles area.

Had this defect gone undetected, extensive damage to the engine could have resulted, creating a serious flight hazard. Cpl Hooley prevented this from developing by his thorough knowledge of the equipment involved, his strict attention to the task at hand and his immedi decision to halt the start attempt.

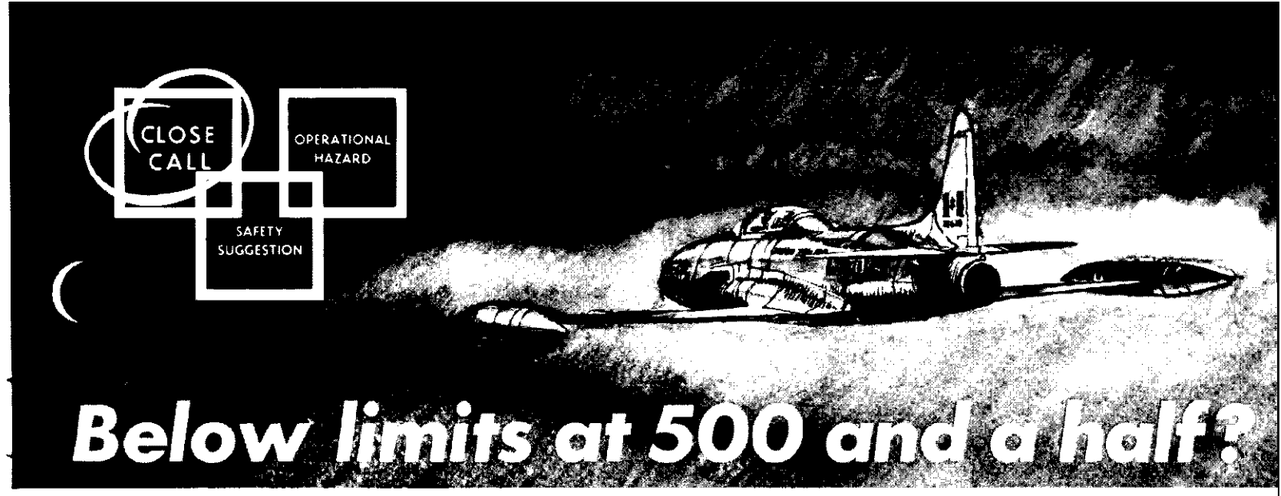
Salvage Crew Recognition

Because of the nature of his profession, a DFS investigator is often required to write critical, but constructive aircraft accident reports. But NOT all resumes are ALL damning. A good example are the following excerpts from a report by DFS investigator Maj W.R. Barnes after a CF104 accident in Europe in October, 1970.

"I noticed that the OC of the Salvage Crew was obviously well liked and respected by his men and he in turn outwardly displayed a justifiable confidence and pride in his men. This gave every man a feeling of belonging to a select group which I feel was responsible for the obvious team spirit and the crew's involved interest in the investigation. The high degree of professional knowledge displayed by the various tradesmen coupled with their concern and enthusiasm was a buoying experience, particularly under the adverse conditions of weather and terrain."

"Perhaps the most important aspect of this investigation was the careful handling the wreckage received. Too often wreckage is treated as useless materials which, unfortunately, must be pain-stakingly picked up. This crew's attitude was quite the contrary as they took great care to ensure that every visible piece was protected from further damage both at the scene of the accident and during the 80-mile journey back to the unit. This concern paid off handsomely during the subsequent detailed evaluation of the suspect parts. I was agr pleasantly surprised to find that the wreckage had be laid out at the unit in a reconstructed fashion rather than in disarranged piles which is more often the case. The extra time taken by this crew to lay the wreckage out in an organized manner saved the Board and myself a great deal of time and effort in searching for interrelated parts."

"It was indeed a pleasure to work with such a dedicated group".



"Both the approach and the landing must be planned. The basis for planning is the information received and noted during the pre-flight preparation and weather briefing, to which are added pertinent facts accumulated during the flight.

During the pre-flight preparation stage, weather and runway conditions, both reported and forecast should be studied thoroughly so that you can anticipate the type of approach. The applicable approach charts for the destination assist you by supplying information about ..."

-- Manual of Instrument Flight Procedures

We are reminded from time to time about complacency. Pilots are particularly vulnerable to complacency when flying an aircraft that has been in the CF inventory for twenty years. As everyone knows, e go anywhere, do anything T33 is the most dependable single engine cross-country aircraft we have. Surprisingly though, it too can run out of fuel the same as its more fuel hungry brothers.

Recently an instructor and his student departed home base on a long-range training trip. The destination was North Bay, with Ottawa as the alternate. Although a low pressure system was moving into the destination area, weather was forecast to be good until 1500. To ensure staying ahead of the weather, departure was planned for 1030 hours.

The flight for the most part was uneventful. Fuel consumption worked out as planned. Approaching destination, the crew completed the pre-descent procedures. The latest weather was ceiling obscured one thousand feet with visibility at one and one-quarter miles. As the weather seemed to be holding up, the instructor asked the student to carry out a TACAN approach with radar monitoring.

Out of FL 330 for FL 200 and all was well. Somewhere in the descent, around FL 250, radar announced that the ceiling had dropped to one thousand feet and the visibility to five-eights of a mile. Still no problem, just do a TACAN approach with a radar pick-off...everyone knows radar limits are two hundred feet and half a mile...should be no problems...never had any before.

Past the initial approach fix and descending for minimums. With verything proceeding normally, the pilots were thinking ahead... ould be a quick turn around and on to Bagotville. But suddenly the light was changed from routine to hair-raising. Approach informed the pilots that the weather had lowered to five hundred feet with visibility at one-half mile and the airport was now below minimums. This development puzzled the instructor, until he opened his GPH 205 and discovered to his dismay that there was no precision radar to the active runway. Down to 8000 feet at this point, the instructor ordered the student to overshoot and press on to Ottawa at FL 210 in accordance with the pre-arranged clearance.

The situation was still well in hand. They selected TACAN Channel 93 and with a fast fuel calculation they were able to assure Centre that they had enough fuel to make it to Ottawa comfortably. At 42NM they began an enroute descent taking vectors from Ottawa to fit the aircraft into the normal stream of traffic. Another fuel calculation confirmed that although low, the fuel situation was not critical.

As they continued on their radar vector it suddenly occurred to the pilot that the TACAN Channel 93 was not situated on the field. There was a further twenty miles to be added on. Tension was finally taking its toll. The new situation was critical. It was almost too late now, but they declared an emergency and obtained immediate vectors towards a forced landing key and made a successful landing. The aircraft just made it to the ramp before the fuel counters read zero. 690 gallons were required to refuel it.

Our thanks to this pilot for the report of his experience. We all can learn from it.

Errornautical Terms

Altimeter Setting -
The place where the altimeter sets - usually behind the control column during a tight instrument approach.

Landing Flap -
A 6000 foot landing roll on a 5000 foot runway.

RAAF Flight Digest

THE PINK LITTLE BODY

Paul A. Jordan
Flight Surgeon
Baden Soellingen

The following article contains the first-hand impressions of a CF Flight Surgeon following his participation as part of an Argus crew in an overseas Nato exercise.

Their job was to fly over-water sorties on anti-submarine warfare and close support patrols, and mine was to provide medical support to this exercise.

To understand the stresses found on such an exercise we should look at a crew during a regular phase of the operation. At 2200 hrs local, one crew goes on "standby"; time to grab some food, usually a sandwich, and log some sack time. Briefing takes place at 0400 local, the rest of the time being taken up with preparations and loading until start-up at 0610. Takeoff is at 0634. There is a one-hour flight out to the area followed by a sixteen-hour patrol. This is by no means the longest patrol but certainly not a luxury cruise either; it is filled with noise, fatigue and between working shifts, time to eat and smoke. At 2230 local it is landing time again with deplaning, an hour for debriefing with the intelligence people then a few beers. A canteen is set up, just a fridge with some beer on a pay as you take it basis. It's not a bad deal, there is lots there and the whole crew is together. It sure is good to get down and take these damn ear plugs out; a beer is just the answer to relax.

"C..... I'm tired! We've been up a full 24 hours now" and with this it's back to the quarters for a crack at the forty pounders. These are great, a forty of CC for $2.65, makes a guy really generous. There isn't a room around without a bottle and now this little cubby hole contains 7 very relaxed, very tired, and somewhat inebriated crew members who for some silly reason are proud of the fact they have pushed their endurance to 25 non-stop hours. Compliments fly about how they are the best, most tightly-knit crew in the place, the crew who know each other well enough to air their bitches through a mist of CC or Bacardi.

The talk turns with authority to technical data and much verbiage is applied to a pseudo-academic autopsy of the tactics of the last sortie. As another forty pounder bites the dust in the hallway the talk has turned to what a hell of a way to punish oneself in the name of service to one's country. About this time hunger and fatigue are beginning to take their toll and the crew captain's room is empty save for almost empty forties and a lot of smoke. It is now 0600 again and time finally to flick in.

Gradually a very aching, very dry-mouthed body is aware of a lot of noise in the hall and a nauseated, burning, hungry feeling is the pit of the stomach. Unbelievably, it is 1600 and a very hungover, very tired crew is beginning to stir in their allotted cubicles. Tea-time is a very welcome break and after a prolonged shower in a made-over cold-storage annex to the quarters, it is time to dress, have some white coffee, tea and a bundle of toast and jam.

Plans follow to pub-crawl for the evening, and these are dutifully carried out until 2200 when of all things, the pubs close. A 2/6 fish and chip dinner will hit the spot and the party goes back to the mess for a couple and on to the cells for the rest of the diplomatic booze until 0400 again. The next day begins about 1200 hrs with lunch, a talk with the crew which just came off patrol and to find you are going on standby at 1800 hrs, to brief at 0100 hrs for an 0230 takeoff. The big problem now is to get some sleep during the afternoon and evening in preparation for a night and day of flying on another 12-20 hour patrol, plus its previously described accompaniments.

A quick recap shows that the pink little body has been asked to do things we wouldn't dream of asking a machine to do. It has functioned at times and for durations contrary to its built-in biological clock; it has defied the laws of nourishment; it has been denied its proper fuel; it has been fed foreign poisons which it has accepted with some protest, but disposed of in its best fashion. Old number one body has groaned a bit, but carried on a reliability in the face of several very great insults. A small amount of reason and a quick look with the retrospectroscope give a panoramic picture of too many waking hours, too much fatigue, too much smoking, too much drinking, too little food, and far too little rest. Think about it. Would you really ask your aircraft to go twice as long before a major inspection and replacement, function on half-full oil tanks or accept 80/87 instead of 130/145? Would you accept an aircraft with the main wheel tires worn down or spotted? Would you want to take an overstressed aircraft across the pond at 6000 feet with minimal fuel and no life rafts?

If your bicycle breaks down you can push it home; if your car breaks down you can get out and walk; if your aircraft breaks down you have a reasonable chance of getting home again, but if your body breaks down it is the end of the log. In the flying game we need a Mark I body in top shape, no minors, no majors in the L14. The Mark II modified body is not acceptable, and in effect is not necessary if you colour the preventive maintenance schedule of the Mark I model with tincture of reason and elexir of common sense.

Dr. Jordan joined the RCAF Auxiliary in 1962 and worked as a mechanic on Otters and C-45s with 411 Sqn in Toronto. Later he trained under DREP as a Supply Officer before switching to the medical side. Following his graduation from the University of Toronto in 1968 Dr. Jordan was based at CFB Cheriton and attended the Flight Surgeon's Course at CFHM. He has recently been transferred to Baden-Soellingen.

Do you fit the seat?

All cockpits are not the same, either in size or crew seats, nor are all pilots the same in size. There are lean and lanky ones, and some short and on the wide side, but each has to fit into his crew seat, albeit some better than others. The following, offered by a flight surgeon, suggests there's more to tranquility in the cockpit than smooth flight. Read on...

"A helicopter pilot, recently a 'guest' at a dispensary due to a case of airsickness, brought to the flight surgeon's attention a number of interesting aerospace medicine problems having a universal application to flying. This particular pilot, who had just transitioned from one copter to another, reported he was experiencing nausea, headaches, and muscle aches from a large number of his flights. He said these had never occurred before and were not typical of airsickness as it is known to the aerospace physician in that the symptoms did not disappear when the pilot took control of the aircraft or when the flight was over.

"After a thorough physical and blood study with negative results, further questioning revealed that these symptoms were more severe while orbiting in a tight circle ...and disappeared when in level flight.

"This, together with the observation that the pilot was 6 ft 4 in. tall led to the following conclusion: While flying, the pilot was accustomed to sitting with his legs extended and his seat in the full-up position. While there was adequate head room for this in one aircraft, in the aircraft he had transitioned to he had to tilt his head to one side to miss the overhead. Then, in a bank he was experiencing the Coriolis Effect: a disorientation caused by acceleration in two planes at the same time. Along with muscle strain from the neck binding, the Coriolis Effect accounted for his symptoms which disappeared when he lowered his seat.

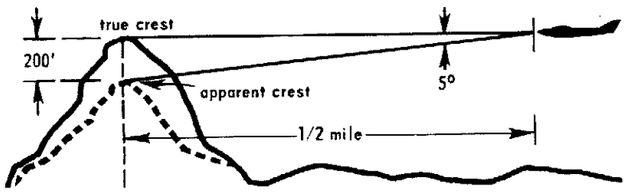
"As the flight surgeon stated it, the lessons to be learned from this case are:

> The space available in a cockpit is finite, from that of a Voodoo type aircraft to the Hercules. Any compromise of this space, either by 'outgrowing' the seat from overweight, being too tall for a particular cockpit as in this case, or by injudiciously 'customizing' the cockpit with bags, instruments, and so on, may cause dangerous and even fatal repercussions. The disorientation caused by the Coriolis Effect is especially dangerous under IFR conditions when no ground reference is present.
>
> The problem of disorientation or vertigo is not confined to aircraft having fixed wing and afterburners. These conditions which lead to disorientation should be discussed and reiterated to all crews until they become as familiar as landing pattern."

Flight Safety Foundation Bulletin

Flying in the Rain

An error in vision can occur when flying in rain. The presence of rain on the windscreen, in addition to causing poor visibility, introduces a refraction error. This error is due to two things. First, the reduced transparency of the rain-covered windscreen which causes the eye to indicate a horizon below the true one (because of the eye response to the relative brightness of the upper bright part and the lower dark part) and second, the shape and pattern of the ripples formed on the windscreen, particularly on sloping ones, which cause objects to appear lower. The error may be present as a result of one or other of the two causes, or of both, in which case it is cumulative, and is of the order of about 5° in angle or about 1 in 12. Therefore, a hill top or peak one half mile ahead of a plane could appear to be 200 feet lower as illustrated.



MOT Information Circular

Aircrew Life Support Equipment

...the '71 status

A report on the current status of design and procurement of aircrew life support equipment.

DROGUE-GUN PARACHUTE A dangerous shortcoming in the arming cable assembly for the Drogue-Gun parachute was uncovered during user trials. As a result the release mechanism has been redesigned from mechanical (cable) to a gas-operated device activated by the lapbelt. This equipment is undergoing AETE evaluation.

LIFE RAFTS Efforts are continuing to develop the necessary specifications for an inflatable double floor for all life rafts. This modification will be reflected in the specifications for the next purchase of life rafts and may be accomplished on some in-use rafts, depending on life remaining.

AUTOMATIC INFLATION VALVES FOR LIFE PRESERVERS Procurement action has been initiated for this equipment. It should be available during 1971.

DUAL-VISOR HELMET The trials of the dual-visor helmet brought to light several deficiencies. The results are being studied by CFIEM which will initiate the necessary modification action. It has not been decided yet if further trials will be necessary or if the modified kit (when available) will go into production.

PERSONAL SAFETY EQUIPMENT OFFICERS (PSEO) The need to train selected aircrew officers as PSEOs and to establish PSEO positions in most flying units and Command HQ has recently been re-established. Accordingly, a course, on at least an annual basis is being planned. The three-week courses will include a visit to the Survival Training School at Namao. This course is intended to produce an officer who is better equipped to supervise the effective use of life support equipment, related training programs and to identify, substantiate and initiate the necessary action to effect modifications or introduction of new equipment.

URT-503 PERSONAL LOCATOR BEACON (PLB) At the time that the URT-503 PLB project started, International Search and Rescue agreements stated a requirement only for a beacon mode of transmission. Dual channel and voice capabilities were mentioned as permissible options. It was decided to procure a PLB with beacon mode only on the basis that inclusion of dual channel and voice would add to the cost and power consumption and reduce reliability and maintainability, while not significantly adding to the primary function of the PLB, that of providing an electronic means of locating downed aircrew. Recently, the requirement for a PLB possessing extended capabilities has become more evident and accordingly Canada has ratified an International agreement stipulating that future PLBs possess these capabilities. An Operational Equipment Requirement stating the requirement and capabilities is being prepared and will in due course result in a replacement for the URT-503. In the meantime we must use the present beacon to its best advantage.

FLYING CLOTHING New flying clothing (CF Green) will be somewhat modified from the existing styles. For example, the intermediate jacket is being redesigned to give a slightly greater degree of insulation and to remove the pockets on the forearm. All new flying clothing will have zippers of synthetic material which will reduce the weight of the garment and should be easier to operate and less harsh on the hands. Evaluation of a two-piece transport flying suit has been completed and early introduction is expected. The type-4 winter flying suit is gradually finding its way into the hands of more users; however, because the type-3 flying suit must be used up first, total change-over may take some time. When type-4 became available there were only a few of the type-3 in depot stocks, but units have returned serviceable type-3 suits in favour of type-4 to the extent that now over 1000 are in various depots. As there are no overriding flight safety or operational considerations that would justify scrapping the type-3s, they must be used up. Out-sized aircrew needn't be concerned however, because when the common sizes are exhausted, the remainder will be declared obsolete. The remaining stocks of type-1 (one-piece) and type-2 (full-length leg zipper) have been declared obsolete and are being scrapped.

SIGNALLING FLARES At present there are several different types of flares in use, from the mini flare to the day-night flare. Efforts are being made to introduce a common type of flare to replace all existing Air Element signalling flares. These will operate from pen-gun launchers. The flares available may include the following:

- mini-star - a single star (usually red) projected to 300 feet with a burn duration of approximately 8 seconds.
- mini-smoke - similar to the star but emitting an orange smoke trace instead of a flare.
- smoke - a dense cloud or orange smoke for a duration of 18 to 20 seconds.
- flare - an intense red flare that burns for 20 seconds. A note of caution - looking at this flare when it is burning may cause significant after image.
- jet - star [illegible], or smoke projected to a height of approximately [illegible] feet.

All of these may be contained in aircraft survival kits and the first two may also be included in personal kits. These pyrotechnics are fairly powerful devices and therefore must be used with caution. They will be evaluated by the CF Survival School and the Maritime Sea Survival School.

KNIVES At present a variety of knives are carried by aircrew. These knives include the Russel Belt (Hunting) knife, the Dinghy knife (blunt end curved blade) and several types of pocket knives. The hunting knife is awkward to carry, frequently falling out of pockets; when carried on a belt or attached to the flying suit, it frequently gets in the way and is uncomfortable. The dinghy knife, designed to cut parachute shroud lines, webbing, etc. is of rather limited use. Similarly many of the knives contained in aircraft survival kits are of obsolete design and limited use. It is preferable that the hunting knife be carried in the survival kit only, thus serving its intended purpose as a survival aid. All existing personal knives can be replaced with the standard USAF MC-1 knife. This knife has two blades, one a hooked blade designed to cut shroud lines and webbing without danger to the user because of its blunted end, and the other, a blade of conventional shape but opened by a spring when a release button is depressed. The knife would be carried in the groin pocket of the flying suit with the hooked blade open. This type of knife is classified as an offensive weapon under the criminal code of Canada, but the Judge Advocate General's office has indicated that if carried in the flying suit and only while on duty, possession of the knife does not constitute an offence for CF members.

"In the middle of February with the water temperature at 42°F and a 9-foot swell, it was..."

"...No day for swimming!"

The experience of this pilot and navigator should be of interest to all aircrew. Some of their difficulties illustrate the dilemma often faced by life support equipment specialists, in that under almost identical conditions, the pilot and navigator encountered problems with different components of their life support equipment:

- **The pilot retained his helmet - the nav lost his;**
- **The pilot had no difficulty deploying his seat pack - the nav was unable to do so;**
- **The pilot had difficulty inflating his life preserver - the nav had no difficulty;**
- **The pilot had no difficulty in gripping the Quick Release Box (QRB) during descent - the nav was unable to do so;**
- **The pilot had great difficulty opening the QRB in the water - the nav had no such difficulty.**

Some parts functioned as advertised for one but not the other.

Corrective action peculiar to this accident must await the facts brought out by the Board of Inquiry. Meanwhile, many of these difficulties have been identified as a result of previous ejections and water entries and corrective action is nearing completion. For example:

- **A new improved QRB will soon be issued;**
- **An automatic, water-activated inflation valve will soon be fitted to the life preserver;**
- **A quick release fitting for oxygen masks is being evaluated which will allow complete removal of the mask during descent;**
- **Immersion suits will be purchased if a suitable supplier can be located;**
- **Break links are being removed from the helmet chin strap which should improve helmet retention;**
- **Fabric aging studies are being conducted to decrease the possibility of deteriorated fabric or stitching giving way, thereby improving helmet retention;**
- **Improvements to seat pack release methods are continuously being sought; as yet a better system has not been discovered.**

Our thanks to Capt Stuart and Capt Wagar for permission to print their accounts of their ejection experience.

by Capt D. G. Stuart

"It started out as a routine training mission for the navigator and I in the Voodoo, with recovery planned for McChord AFB; it terminated in the water 3-1/2 miles off the end of the runway. The start and taxiing had been normal, but soon after getting airborne and out of afterburner things began to happen. As we entered a climbing turn to the left we heard a loud bang. I had just enough time to say to my Nav, "What in hell was that?" when we heard and felt another bang. Glancing at the instrument panel I saw the right engine tachometer spinning like a top towards zero. My first reaction was to pull back the throttle on the right engine, but in doing so I inadvertently pulled both throttles toward idle. At the same time I was trying to gain some altitude and I informed my Nav that we had lost the right engine. I then checked the Exhaust Gas Temperature (EGT) on the left engine and had started to move the throttle forward when the aircraft shuddered with a series of two or three more bangs. The last one was louder than the rest and I noticed a steady fire warning light on the left engine. Throughout the series of bangs or explosions the aircraft was difficult to control in yaw and roll. I told my Nav that we had a steady fire light on the left engine and gave him the order to EJECT!

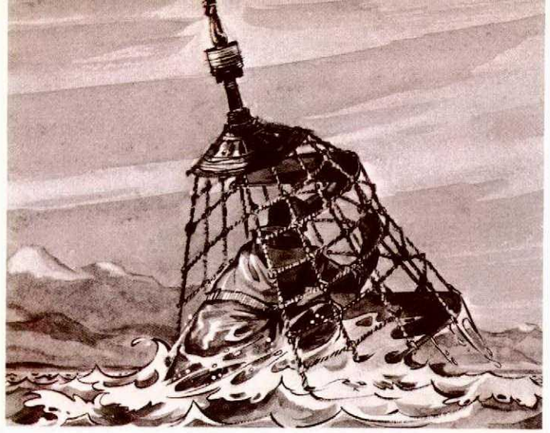
"I reached for the handles, but before or just as I got them the canopy blew. I assumed that my Nav had fired the canopy. I then pulled the ejection handles and squeezed the trigger as the aircraft rolled violently to the left. As I sped up the rails I recall thinking, 'Hell this only happens in the simulator'.

"My first sensation was that I was tumbling, then there was a sudden stop. When I opened my eyes and looked around and up, I saw a fully opened chute. I had difficulty seeing because my oxygen mask had been forced up near my eyes. After undoing the chin strap and loosening the mask so that I could see and breathe, I noticed my Nav just a few yards away from me at roughly the same altitude. We assured each other that we were OK, then set to work preparing for our fast approaching dip. I deployed the seat pack contents, rotated the parachute quick release box (QRB) and inflated my life preserver which had slipped around on my body making it difficult to find the inflation toggle. (If it had been dark I don't think I would have found it). I looked down and noticed the dinghy had inflated and with the water coming up fast I put my thumbs behind the QRB with my fingers on top and waited for the splash.

"As I hit the water I lost control of the QRB. I went down, promptly came back up, and found myself being dragged through the water on my back. I think I was under water more than on top for I had great difficulty breathing and I took in a lot of sea water. Finally I got hold of the QRB again and attempted to squeeze it, but the tension on it prevented it from releasing. After what seemed like hours, but was probably only seconds, I began to ride on top of the water and was free to pound the QRB with my fist. Finally it released. I then pulled my raft in to me and lay across it for a moment to catch my breath, I was exhausted.

"During my parachute descent, I had noticed a helicopter coming towards us. It hovered above me as I lay across the dinghy and when I gave a wave it moved off to pick up my Nav.

"In the meantime I got into the raft. While sitting there I pulled in the survival pack, but I decided the helicopter would soon be back so I tossed the pack (which was still attached to the raft) back into the water. I then removed my boots. I was then suddenly hit by three or four huge waves, probably generated by the Voodoo impacting on the water. The waves were about 20 feet or more in height and I was amazed that the dinghy rode them out so well. As they subsided I noticed the helicopter returning. I stayed in the dinghy until the helicopter was nearly over me, then I slipped



into the water and swam towards the basket they had lowered. I was hoisted into the helicopter where I noticed my Nav on the floor with two men giving him artificial respiration. I also noticed that he had been burned and his flying gear was burned and ripped to shreds. What had happened? Since he went through it I'll let him tell it."

by Capt L. E. Wagar

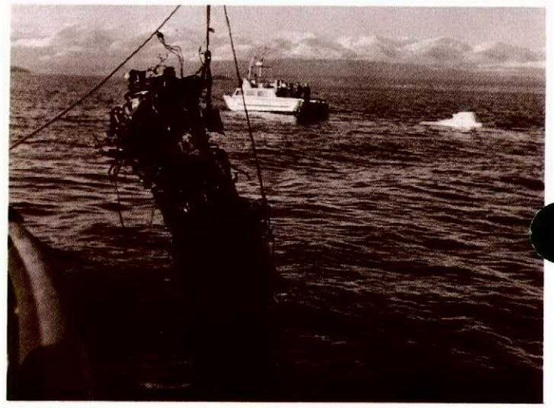
"...When I pulled the handles I remember wondering if the seat was going to fire. My question was immediately answered as I felt myself being propelled out of the aircraft. Shortly after the seat started in motion I felt a hot blast of air from the exploding aircraft sear my face and I knew I had been burned. My immediate concern was that the fire had damaged my chute, however I soon felt a surprisingly gentle tug on the shoulders and then I knew that my chute had opened. I do not recall the seat separation, but I remember that at one point during the ejection sequence I realized that my helmet had been lost.

"After confirming the condition of my parachute I began looking for my pilot and discovered him quite close by. We discussed deploying our seat-packs. He had no trouble with his but I never did locate the yellow release handle on mine. During the descent I had time to inflate my life preserver and to observe our aircraft in a steep nose-down attitude, engulfed in flames and black smoke. I did not see it hit the water however. Preparing for water entry I finally abandoned attempts to locate the seat-pack release handle. I rotated my QRB, assumed a position with my legs together and attempted to insert my thumbs in behind the QRB. I was unable to accomplish the latter however because of the tension created on the QRB by the shoulder straps and the inflated life preserver. I even thought of releasing some of the air from the preserver but abandoned the idea when I saw the water was choppy. I decided instead to go for maximum buoyancy.

"I landed on my side and was almost immediately pulled onto my face and dragged by the parachute. To get the parachute harness released I rolled onto my back. It was then just a matter of squeezing off the QRB and getting out of the harness. From then until I was rescued by the helicopter I was continuously dragged by the parachute. (The parachute was still attached to the seat-pack and the seat-pack was attached to my life preserver). My thoughts were to retrieve the seat-pack which was dangling in front of me and manually release it from the chute. In retrospect my best bet, with the rescue helicopter near at hand, would have been to release the seat-pack lanyard from my preserver which I could have used for support until rescue.

"When the helicopter arrived, I was just about at the end of my strength - I gave a tug at the bayonet connection to the Mae West and thought I had released it. The helicopter crew lowered the rescue net very close to me and I was able to climb onto it. The next thing I remember, I was back in the base hospital.

Arrival back at the ramp where a doctor and ambulance were waiting occurred 10 minutes after the Voodoo crew had released brakes for takeoff. This was due to the timely arrival of one of the rescue helicopters from 442 Sqn which had been enroute to a nearby island for hoisting and slinging practice. The crew had seen the fireball, spotted the chutes and the helicopter arrived overhead soon after the two crewmembers had landed.



Wreckage recovered after being located by the submersible, PICES II, shown in the background.

The strip investigation of the right engine showed that a third-stage compressor blade had failed due to metal fatigue. The wipe-out of the number 1 (low pressure) compressor split the compressor casing in several places allowing blades to escape at high velocity. An uncontrollable fire then developed in the number two and number three cell area.

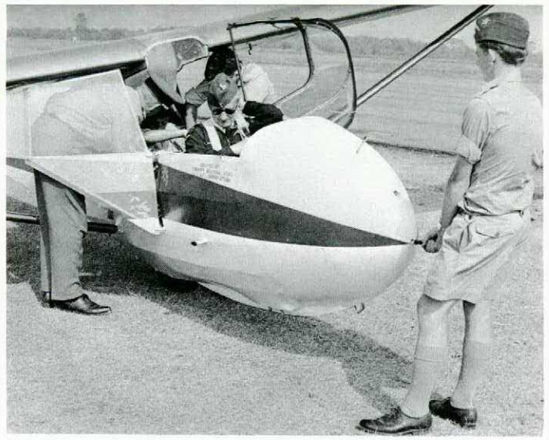
Emergency flashlight holder

Members discussed the idea of putting velcro tape on helmets, strobe lights and flashlights. This would enable a pilot to attach either of the lights to his helmet in an emergency, thus leaving both hands free.

- Flight Safety Committee

And Gliders Too!

Once again this summer the Canadian Forces will support and supervise gliding activity for 7500 air cadets who will attend one of the summer camps at Penhold, Trenton, Bagotville or Greenwood. Last year almost 10,000 winch-launched glider flights were safely conducted - an increase of almost 100% over the number of flights made in 1969. This year it is probable that the number of flights will again increase since more winches, more gliders and more glider pilots will be available. In view of these facts, it is well for all of those who will be associated with gliding operations in any way, to remember that gliding is yet another way of flying and, like powered flying operations, can be quite unforgiving. Just recently an experienced glider pilot was killed when he was unable to recover from a spin which occurred while he was attempting a 180 degree turn. Now is the time to make sure there are no loose ends in our gliding operations planned for this summer.



AN ILL WIND

Recently a pilot ejected after a mid-air collision and ended up hanging in the trees about 100 feet above the ground. A nearby helicopter established a hover over his chute as soon as it settled into the trees. Immediately, the rotor downwash dislodged the chute, and the pilot was on his way down again. Fortunately, the chute caught a second time and he was stopped - this time only ten feet above the ground.

A few points should be emphasized here:

First of all, for the helicopter types - let's not be too hasty when time is not of the essence. Establish communications with the survivor and determine his condition. If he is in the trees, wait to see if he can make it to the ground. If he cannot, realize the effect your rotor will have on him and use a higher hover.

Secondly, if you bail out and end up in the trees, try to make it to the ground. If you cannot, or determine that it would be best to stay where you are, keep in mind the effect the rotor wash can have on you. Secure yourself and stay there until you can get safely on the hoist.

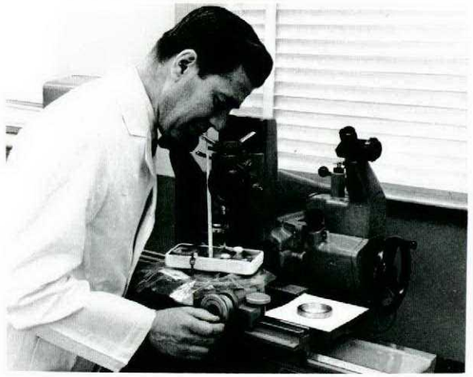
USAF FSO Kit

BEST BANG OF THE MONTH

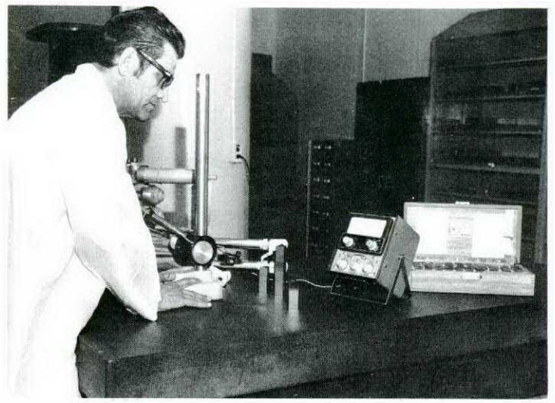
Like land man! Now!

"At approximately 90K on the takeoff roll, a moderate thump was felt from the left main gear. The aircraft yawed slightly to the left but became airborne within a few seconds. Due to the innocuous nature of the incident, a full target mission was flown. On return to base another aircraft flew alongside and reported that the landing gear appeared undamaged. When the aircraft taxied into the line it was found that the left main tire had blown."

Contributions to this feature are welcome. It provides another opportunity to learn from the experience of others.



In Quebec Standards Laboratory a bearing housing from an elevator control system is checked. It is measured to millionths of an inch, when cooled to –20°C by alcohol and dry ice. Although this assembly is dimensionally satisfactory at ordinary temperature, different coefficients of expansion of its steel and aluminum parts caused it to seize at low temperature.



Parallelism of pistons of a Stabilizer Servo Actuator is checked on a surface plate. Misalignments of such precision-guided parts often will cause jamming. The surface plate, is flat within 25 millionths of an inch.

A ball and roller bearing specialist examines an Argus bulkhead interconnection carrier assembly to see why the bearing seized and what improvements can be made in design, installation, or maintenance. Bearings have many moving parts; high speeds, shock loadings and exposure to environment are typical failure-producing causes.

QETE

Retailers of Accuracy

This is the fourth article in a series on the Quality Engineering Test Establishment (QETE) relating how that Unit's facilities are utilized to contribute to accident investigation and flight safety.

The Metrology Standards Laboratories of QETE exist in part to calibrate and monitor the accuracy of measuring equipment used by other laboratories in the complex. Inspection of vehicles is familiar to readers as a safety procedure; this applies to measuring equipment as well. That is why it is necessary for a Standards Laboratory to periodically check and certify equipment accuracy. Even accurate measuring devices may change by aging, wear, corrosion, dust, impact abuse and shipment.

Let's take an example which first shows how measuring equipment may be used, and then itself tested. The Hydraulics Laboratory at QETE tests aircraft hydraulic components for a variety of reasons including failure proneness; an incident in the laboratory is preferable to one in the air. Aircraft hose is tested at seventy impacts per minute; things are moving too fast to use an ordinary pressure gauge to adjust these surges so an electromechanical set-up is used. The pressure is felt by a piezo-electric crystal (the crystal, when squeezed, generates instant voltage); the small crystal voltage is fed to a charge amplifier and an oscilloscope is used to present the amplifier output.

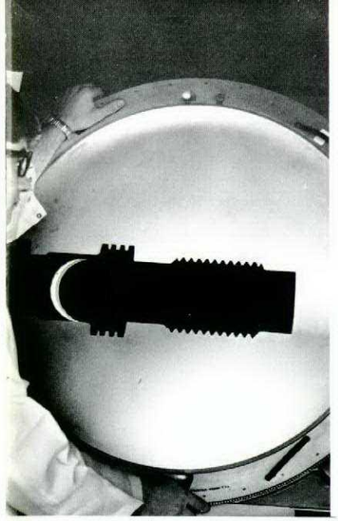
Similar instrumentation is used to test the CF104 control servo-mechanisms with varying pressure cycles as short as one-tenth of a second or 120,000 cycles in 200 hours of testing. At this speed a pressure gauge needle would look like a humming bird's wing. Electronic instrumentation has other advantages as well, in that the character of build-up and decay of pressure surges can be mapped.

The pressure cycle of a hydraulic test rig or system is as important to the tested component as a doctor's test of blood pressure is to his patient. The Standards Lab are therefore called in to verify that the hydraulic equipment is reading correctly and that the tests are meaningful. The Electrical Standards Lab certifies measurement accuracies concerning voltage, resistance, capacitance, frequency and impedance, while the Mechanical Standards Facility is concerned with precision dimensional measurements such as size, alignment, force and surface texture.

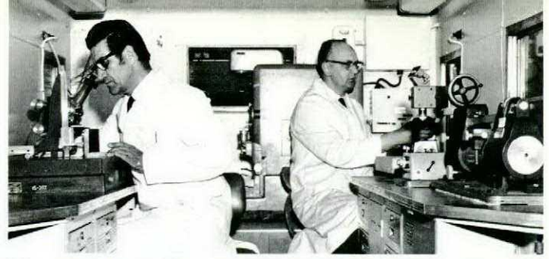
The characteristics of the charge amplifier and the oscilloscope are individually calibrated by the Electrical standards Laboratory. Then the overall accuracy of the output of the complete system, as read on the oscilloscope is verified in the Mechanical Standards Lab by applying a known pressure to the transducer.

Where do Standards (Metrology) Laboratories find their accuracy? Their equipment is traceable to National Standards which, in turn, are matched to International Standards for the six base units of measurement including length, time, mass, temperature, electrical and luminous intensity. Work in parts per million is an everyday occurrence.

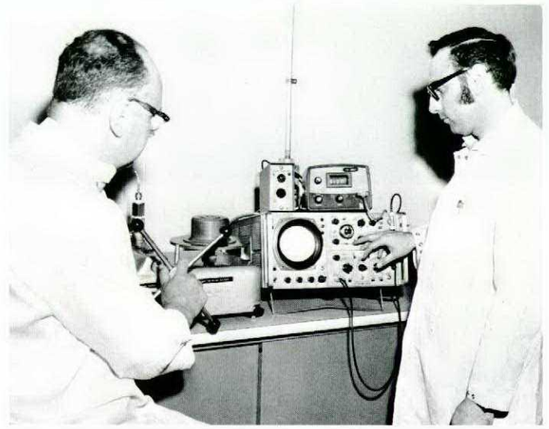
These examples show that a lot of equipment is used to arrive at an answer. It is essential that such answers have a known tolerance. The Standards (Metrology) Laboratory ensures that a range of measuring equipment with known degrees of accuracy is constantly available to other laboratories, to enable them in turn to provide accurate and timely results to their clients - including the Directorate of Flight Safety.



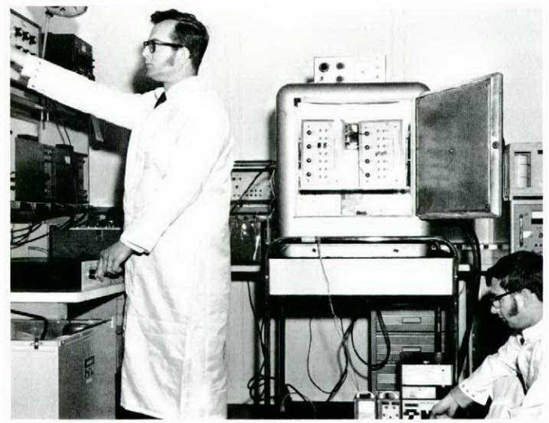
At the Hull Standards Lab part of a CF104 stabilizer servo power control unit involved in an in-flight incident is inspected. The optical comparator gives precise magnification of contour, permitting accurate measurement. Measurements are an important part of the section's business because a few ten-thousandths of an inch often makes the difference between safety and failure.



The Mobile Laboratory permits calibration of safety inspection devices on site or in other laboratories, as well as certification of inspection equipment used in plants producing aircraft components.



High speed response pressure measuring system is checked by members of the (Mechanical Metrology Lab) and the (Electrical Metrology Lab). The three laboratories, the Mechanical Metrology Laboratory, the Electrical Metrology Laboratory and the Quebec Detachment (mechanical) co-operate on complex projects.



In the Electrical Standards Laboratory a transfer standard for electrical resistance is calibrated, with references to standards calibrated by the National Standards Custodian (National Research Council). These transfer standards are used by CF Bases to verify flight equipment to assure its safe functioning.

An FSO Speaks

The HS-50 Story

Capt S. D. Helmkay
HS-50

HS-50 is located just a few hundred yards from Halifax harbour at CFB Shearwater. It is readily accessible to our friendly shipborne partners across the harbour and is situated in an ideal area to carry out training in our anti-submarine (ASW) role. The Squadron flies the Sea King helicopter which is considered to be one of the most effective ASW helicopters in service today.

HISTORY

This Squadron was commissioned originally as an experimental squadron to evaluate airborne dunking sonar and devise the related helicopter tactics. A test program on the H04S-3 (HORSE) helicopter was initiated in 1954. Trials revealed the great potential of the concept and in the early 60s an all-weather aircraft with automatic transition and hover capability, the Sea King, was procured. Shortly thereafter, the first helicopter destroyer went into service and the integration of Sea King into the fleet was completed by 1964.

ROLE

The role of the Squadron today is to provide aircraft and qualified personnel for operational helicopter destroyers (DDH). To achieve this, we broke away from the traditional centralized administration and developed a system of independent detachments (Dets) served by a headquarters staff. This typical destroyer detachment consists of 5 pilots, 2 navigators, 2 observers and 12 maintenance personnel.

DETACHMENT CONCEPT

The detachments normally commence pre-embarkation operational training four months before going to sea. During this time the detachment develops into a proficient, operational unit. It is left much on its own to organize and train, but its training is monitored by Squadron Standards and Current Operations Sections.

Just prior to embarkation, the embryo "Det" is assigned an aircraft to maintain and fly. The transition from the shoreside training program to the sea-phase operational readiness state is conducted aboard the parent ship during a three week intensive work-up period.

The work-up period terminates the shoreside training; operational at last! These operational detachments normally remain together as a unit throughout a complete ship's 20-month cycle. Today HS-50 consists of three embryo and six operational detachments.

AIRCRAFT

To understand the shipborne operation, a basic knowledge of the aircraft is required. The Sea King is powered by two GE T-58-8B Turbo Shaft engines, each producing 1250 shaft horsepower. It is capable of speeds up to 144 knots and has an endurance of approximately 4-1/2 hours. When fully fuelled and stored for an ASW mission, it has an all-up weight of 1900 pounds.

The aircraft has an IFR capability. The flight control system contains sophisticated automatic stabilization equipment and a coupler system which allows the pilot to fly a hands-off transition from 150 feet over the water at 60 knots to a 40 foot hover. The Sea King has a boat-shaped hull and floatation gear in the landing gear sponsons which gives the aircraft an amphibious capability in an emergency situation.

With its breeze hoist, the aircraft can perform Search Rescue missions. In a sea environment it is exceptionally useful in this secondary role. The aircraft can also be employed in a utility configuration as a troop carrier. Past exercises have proven it quite successful in this role.

The helicopter has been modified for destroyer deck operations by strengthening the landing gear to withstand the stress of heavier destroyer deck landings by engineering a blade and pylon fold system to make it possible for the aircraft to fit in the tailor-made hangar and by designing a main probe and tailprobe by which the aircraft can be rapidly secured to the deck in heavy seas.

SHIPBORNE HAULDOWN

On rough seas, it would be impossible to operate from a destroyer without the assistance of a securing device on the Flight Deck. It would also be impossible to move such a large helicopter into and out of the hangar without a means of mechanically straightening and centering the aircraft beforehand.

To facilitate this requirement a helicopter hauldown rapid securing device was obtained. Not only does this system meet the above prerequisites, it also assists the pilot in initiating and completing a safe landing.

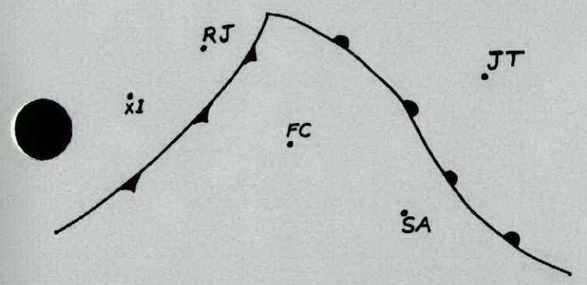
The hauldown system is operated by the Landing Safety Officer (LSO) from a Control Position on the forward end of the Flight Deck. He controls both the hauldown and deck manoeuvring of the helicopter. This system is capable of functioning with ship motion up to 31 degrees of roll and 9 degrees of pitch.

FUTURE

The mid-life conversion plan for the Sea King was completed last year and a mock-up was produced in UACL near Montreal. If approved, this mid-life program should begin shortly. The advent of the 280 class destroyers, with the capability of carrying two helicopters will increase the size and scope of HS-50 and present many new challenges.

Captain Helmkay joined the Royal Canadian Navy in 1965. In February 1967, he graduated from the Flying Training School in Portage La Prairie and was later cross-trained to helicopters. After completing the basic helicopter course at Rivers, he was posted to Shearwater and has since been flying the Sea King helicopter. Captain Helmkay initially served for eight months on the Bonaventure and later on four of DDHs (Annapolis, Assiniboine, Saquenay, and Skeena). He is presently employed as Unit Flight Safety Officer in HS-50.

How's your Wx?



Here are some actual weather situations. Your problem is to match the weather reports with the stations on the map.

A. -XE503/4F 039/60/59/2007/963/F6SF2 820

B. M26015RW- 084/48/45/0714/977/SC10 733

C. M80015 099/61/51/2704/982/AC10 211

D. E12006H 030/64/48/2608/961/AC9 120

E. W1X1/8F 103/61/61/2320G24/983/F10 808

Answers page 24.

Gen from Two-Ten

T33, SURPRISE! After the fourth touch-and-go the nosegear indicator showed unsafe and the gear warning lights stayed on following the up selection. The pilot lowered the gear and selected emergency hydraulics, but the nosegear remained unsafe. He then reported his problem to the tower and obtained permission for a pass by the tower to have the gear checked visually. When the aircraft came by the tower, it was apparent the nosegear had extended only 45 degrees. However, a communications problem then developed as the controller told the pilot that he had "a cocked nosewheel". In fact, the nosewheel was only "partially extended."

With this information the pilot decided to do a touch and go and bounce the nosewheel on the runway in an attempt to straighten it. When he attempted this, the nose settled onto the runway and the aircraft slid down the centre of the runway for approximately 2000 feet.

The investigation revealed that the eye bolt in the nosegear actuating cylinder had fractured. Subsequent electron microscope investigation at NRC indicated that the failure was due to fatigue and originated at a grease nipple hole.

Reviewing the communications between the controller and the pilot, the investigators found that no one in the tower had noted the significance of the misleading transmission. When the pilot, thinking that the nosegear was fully extended, said he was going to bounce the aircraft on the runway, the tower personnel assumed this would be done on the main wheels, while the pilot intended to land normally on the mains and then bounce the nosewheel to straighten it.

As a result of the accident, tower staff have been briefed on the necessity for clear and precise communications. The instructions for the QFI in the tower have been amplified to include monitoring terminology.

CF101, LIGHTNING STRIKE The aircraft was descending in cloud through 8000 feet when the crew experienced a sound like explosive decompression. The pilot saw something passing by the windscreen and then noticed that he had lost all pitot-static flight instruments. Moments later the aircraft flew into visual flight conditions.

An emergency was declared and a second CF101 on approach joined up. The pilot of the disabled aircraft continued the approach on the wing of the other aircraft and made a safe landing.

Investigation revealed that the aircraft had been struck by lightning which had resulted in the loss of the radome and pitot boom. Fortunately, the pitot boom departed without striking any other part of the aircraft and the breakup of the radome caused no damage.

The approach was under radar control at the time of the lightning strike, but radar did not show anything abnormal in the way of weather.

The best solution is to avoid likely areas if at all possible. 1 CAG has experienced four lightning strikes this year, and an F104 from another country was lost due to an electrical failure following a lightning strike. Still another strike this year caused a tip tank on a Danish T33 to explode, knocking the aircraft out of control and forcing the crew to eject.

SEA KING, STRUCK PARKED AIRCRAFT The pilot was attempting to manoeuvre through a congested tarmac area to pick up a VIP passenger from a staff car which was parked on the airfield. To get to the car he had to taxi between two parked aircraft.

Thinking that he had enough room to go by, the pilot assigned the co-pilot to watch the left side while he concentrated on the right. As they came closer the pilot saw that the clearance on his side was questionable. At that point he directed his observer to marshall him through, however, as he was bringing the aircraft to a stop the main rotor struck the wingtip of one of the parked aircraft putting a two-foot hole in its trailing edge and damaging the rotor tip.

To stop and disengage the main rotor at the point where the incident occurred would have resulted in further damage to the parked aircraft as the blades drooped, so the observer was then sent out to marshall the helicopter through to a parking spot.

CFS, INADVERENT GEAR SELECTION The aircraft was flying lead in a two-plane night formation. On their return from the local area the element carried out a formation pitch, intending to follow it up with a touch and go landing. The landing was normal and after a short roll, the student in the front seat applied full military power for the overshoot. Almost immediately both pilots' attention was drawn to the red lights glowing in the landing gear handles and they observed the gear handles in the "up" position. Simultaneously the gear collapsed and the aircraft settled to the runway.

As the aircraft slid down the runway in a shower of sparks, both engines were shut down and the drag chute was deployed. Both the instructor and student began unstrapping and when the aircraft appeared to be slowed down they opened their canopies. When the student opened his, it was immediately torn from its mounts and lodged against the vertical stabilizer. Fortunately the instructor did not fully open the rear canopy until after the front one had torn off, otherwise there was a possibility of injury to the pilot as a result of collision or entanglement of the canopies. As a result, action has been taken to amend the CF5 AOIs to spell out the procedures for canopy opening during an emergency landing which necessitates a ground egress.

The investigation revealed that the student had been somewhat apprehensive - it was his first night formation mission. During the landing roll he was psychologically concerning himself with one aspect of his responsibilities - keeping adequate separation from number two - when confronted with another. In doing so he inadvertently raised the landing gear before the aircraft had attained flying speed. Since the nose had been held off during the overshoot roll, sufficient weight was off the right main gear to permit the ground-air safety switch to operate.

Under the circumstances, the instructor could do little to prevent this accident.

CF104, TECHNICIAN INJURED During a Daily Inspection a crew was carrying out a leak check using a hydraulic test stand. Unknown to other members of the crew, one of the men had entered the right main wheelwell to visually check the landing gear wiring and switches. When hydraulic pressure was applied, the forward main landing gear door, which the technician had opened, closed, trapping him between the door and the centre spar of the fuselage.

Since the CF104 was introduced into the CF inventory and despite the education efforts that have gone into prevention, at least once each year an incident occurs in which a person is trapped in landing gear doors. Fortunately the technician was not seriously injured this time.

The situation generally in these cases, as it was in this one, is the same: the senior supervisor is distracted or occupied elsewhere; both electrical and hydraulic power are connected to the aircraft; a crew is performing functional checks; an individual, doing a separate inspection not associated with the functional check proceeds into a danger area. When there is no one clearly in charge of all personnel working on the aircraft, the situation is set up for this type of occurrence.

Comments to the editor

Ear Defenders Suggestion

In Maj Wong's article about FOD (AND ON IT GOES Page 20 JAN-FEB 71), he states that ear defenders were the cause of FOD in two J79 engines. This raises the question of why are we still using those big clumsy-looking things, which make the wearer look like a second cousin to Mickey Mouse. There is a form of Cotton Batten or Cotton Wool on the market made specifically for noise suppression. The product I have in mind is made in Sweden, (Company name and address is available). This product is used by I.C.I. at their factory in Doncaster, Yorkshire, England, and it is used successfully. I personally would prefer this Cotton Wool to the present ear defenders, which when not being worn are usually carried in a sling attached to the trouser belt or are held under the pocket flap of a parka - which doesn't present any problem until the earpiece catches on something (usually when climbing out of a cockpit). Then the earpiece parts company from the rest of the defender and in the case of a CF104 this can cause a lot of work retrieving it. However, if the aircraft is going flying right away and the owner of the dropped earpiece does not realize he has dropped it, we now have a potential case of airborne cockpit FOD.

If the present defenders are the best available - maybe they are for medical reasons - could a way be found to improve the method of securing the earpieces, or would it be possible to introduce the Cotton Wool on a trial basis? It would certainly stop the FOD problem in this area.

Cpl P.A. Aiston
Baden, Germany

The reason that "we are still using those big clumsy-looking things" is that nothing else, including any cotton yet developed, will do the job as well. The very same ear defenders are incorporated into the flying helmet, and have given little ground for complaint.

The point is that aircraft make a lot of noise, and half-hearted meas-

ures won't do any good. When something comes up that appears to be effective, and simpler than our present equipment the Sonics Section at DRET (Defence Research Establishment, Toronto) are asked to evaluate it. So far, the only devices that are as good as the ones we have are equally big and clumsy-looking.

Finally, we agree that there are all sorts of problems with the present equipment, but nothing better is yet available. Ear defenders have to be treated with care, and with respect. At least their bulk makes them less likely to be causes of FOD than screwdrivers, pliers, wrenches, and odd loose bits of wire.

Not "Pilot Error"

I wish to bring to your attention that, although, the account of the T33 hypoxia incident in the Jan-Feb '71 issue is relatively complete, the conclusion arrived at is incomplete. This was not a simple "pilot error" incident.

This particular incident could have occurred whether or not routine mask checks had been performed on the ground or in flight. When the pilot coughed in flight, the piece of rubber left from mask trimming became lodged in the exhalation valve, causing it to stick in the full open position. The concomitant failure of the flapper valve which had a tear on its perimeter caused the leak of cabin air into the mask.

This unusual incident is dangerous for several reasons. On pressing the press-to-test button and receiving 100% O_2 under pressure, the pilot felt improved. Selecting 100% O_2 on the regulator he again felt well temporarily, so he did not suspect a failure of his O_2 system and did not pull the green apple.

Before criticizing those who serviced the mask, it behooves us to look at the EOs they followed. The EO (EO 55-60CA-2, dated 29 Oct., 1969, page 3, subpara h) did not call for a visual inspection of the interior of the MC3M connector and the mask accordian tubing after mask trimming.

Following the incident in question an EO amendment to subpara h was prepared. It read, "clean the mask thoroughly and visually inspect the interior of the MC3M connector and accordian tubing to ensure that no mask cutting debris is present". This amendment was published within a month of submission of the UCR.

This incident points out again that familiar aircraft with good servicing reputations can lead to an attitude of complacency in servicing and in operation. The more familiar the bird and the more confidence we have in its servicing, the more vigilant we must be against complacency.

Maj John R. Hodgkinson
Directorate of Preventive Medicine
CFHQ

Your remarks about "pilot error" are quite correct. We inadvertently permitted that implication in attempting to alert aircrew to the hazard brought to light by this incident. A "pilot factor" was not assigned.

CFP 164 Sought

With reference to "Comments" on the inside front cover of the Jan-Feb 71 issue, I read with interest that pilots should "get hold of a copy of CFP 164". The notification of availability of this publication was promulgated in CFSO 399/70 of 16 Oct 70. The distribution was decided by CFHQ. I have been checking with Base Supply regularly since November, and to date have not received a copy of CFP 164.

At one time there was a catalogue of publications which was distributed to unit level so that the user could be kept informed about the status of publications. To my knowledge no such catalogue exists. One of the results is that the user has no simple and sure way to determine how many amendments have been issued for publications he now holds. A second result is that he does not know if he is entitled to hold new publications which have been authorized for issue. If the distribution system were completely infallible and efficient through all levels, there would be little risk of inconvenience. Unfortunately the system is not perfect.

I believe your magazine would be performing a useful service to all those who read it in the Canadian Forces if you could publish a list of Flight Safety associated publications giving their distribution and the current state of their amendments. As a follow-up it would be helpful if you could include mention of new publications and amendments as they become available, or once or twice yearly as space and time permit.

In the meantime, I would be interested to know if CFP 164 is to be issued to all flying units, and if so, whether or not the air OP troops of the artillery regiments were included.

Maj G.N. Mastin
CFB Valcartier

The answers to most of your questions can be found in CFP 221(1).

CFP 164 distribution is controlled by CFHQ/DARTS who review all applications for distribution. The following is the current FMC distribution:

Montreal	*21*
Gagetown	*3*
Valcartier	*2*
Petawawa	*3*
Calgary	*2*
Shilo	*1*

Answers to - How's your WX? A-FC B-JT C-XI D-RJ E-SA

Bonk!

Over the top of a loop the student applied a little forward pressure on the control column, resulting in a negative G condition. A flashlight, probably located under the instrument panel, came out and struck the student on the head. The student was not injured. The incident was reported to servicing, but the owner of the flashlight has yet to be determined.

Extract from Message

BIRD WATCHERS' CORNER

MURPHY MONGER

Prevalent but rarely seen, the Murphy Monger, from the cosy obscurity of his nest, perpetrates marvels of ingenious duplication. A devoted disciple and descendant of the flock's founder who was a breakaway mutation when birds first began to fly, the Murphy bird gleefully opens his Pandora's box of interchangeabilities. Long suspected of nearing extinction (only identical twins survive), his handiwork nevertheless persists to confuse and befuddle; only the vigilance of his potential victims foils this master of the perverse reverse. Meanwhile, busy at his board the maniacal monger busily pencils away while whistling his mismating call:

THENAMEOFTHEGAME ISTOMAKEBOTHPARTSTHESAME

A FABLE

A group of birds decided to form a safety program. So they called a meeting and the Duck stood up and said, "I think we should have a lot of safety meetings. It's another way we can get together with the flock and bawl them out."

But the Rooster said, "No, that takes too much time, and we've got to get the pipe in the ground." So the argument went on. The Parrot said, "We don't need any meeting. Everyone will be safe because they know it's the right thing to do."

All the birds cheered, for they knew that no one tries to get hurt on purpose. Then the Mockingbird said, "What we need is a lot of posters. We will put posters up all over the place and we'll have safety." The Thrush said, "We don't want posters," and the Sparrow said they do just as well if they had some slides. The Goose stood up and said, "What we really need is a safety director who'll be stern." But the Starling thought it was more important that the safetyman be a "good mixer." The Blue Jay figured if the safety director laid off the safety inspections he'd automatically be popular with everyone.

The real wrangle came over the protective equipment. Some thought everyone should wear it all the time. Others thought only part of the time, and others said it should be written out so they wouldn't have to make any decisions.

So finally the Owl arose and smoothed his feathers. Everyone grew quiet, for they knew he had great wisdom. "Friends," he said, "all this is secondary I'll tell you what we need. What we need is sincerity." And all the birds applauded and stomped and whistled.

"Yes, sir," repeated the Owl quite pleased with himself, "above everything we must be real sincere - even if we don't mean it."

And so they formed a safety program - and it was for the birds.

— USN BIOENVIRONMENTAL SAFETY NEWSLETTER