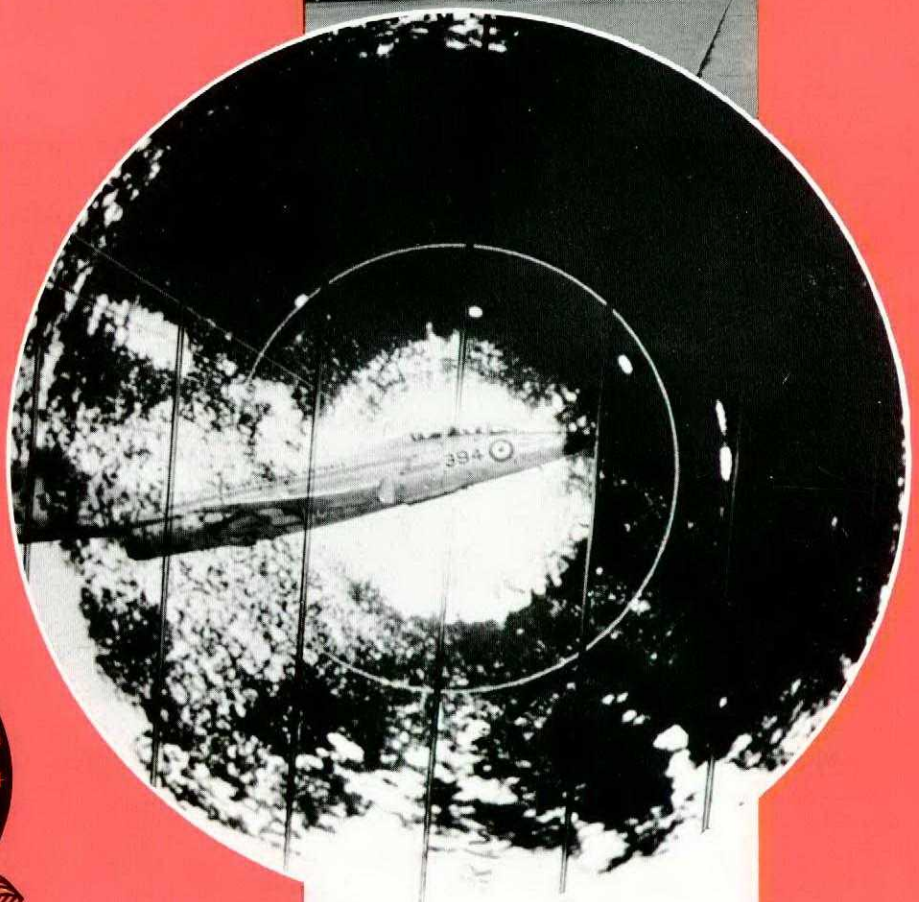
FLIGHT COMMENT

MAY · JUNE · 1968



CANADIAN FORCES
AIR DEFENCE COMMAND
DETEGERE ET DESTRUERE

Comments

Last year an eminent meteorologist wrote an article on thunderstorms which was widely acclaimed. It discussed the circumstances leading to the loss of an airliner which had attempted to penetrate a squall line. Salient among the points was the author's well-intentioned advice on the "safest" region in a thunderstorm. Articles of this sort imply that thunderstorm penetration is on the books for a pilot sooner or later – a proposition we strongly oppose. We can draw only one conclusion from our statistics – flying into a thunderstorm is asking for trouble. This is not to say, of course, that no pilot will ever lock horns with a CB, but attempting to answer questions like "What is the safest altitude to penetrate a thunderstorm?" is overly suggestive. Excluding combat requirements – and even here thunderstorms or squall lines can seriously degrade effectiveness – there is simply no justification for attempting penetration of these icebergs of the air.

A base medical officer recently completed a survey of hearing changes in members of a jet squadron ranging in age from 21 to 40. He found that more than 50% of the aircrew had suffered some hearing loss in the last year – offset by a slight improvement in hearing of another 32%. Hearing loss was greater for groundcrew than aircrew. Requests for soundproofing buildings, etc, have gotten nowhere; the immediate need is for more extensive use of earmuffs around hangars and tarmacs. Also, aircrew were advised to wear their helmets proceeding to and from the aircraft when the noise level is high.

Since January 1954 we have had no fewer than ten in-flight losses of throttle control in the T33 – not to mention three similar occurrences on the ground following a flight. (The first victim of this malfunction was recommended for a Good Show in Crash Comment – Flight Comment's predecessor.) In 1965 a T33 crashed, writing-off the aircraft; the throttle had become disconnected. The latest occurrence is an embarrassing reminder that despite our operating this aircraft for well over a decade we have failed to prevent a hazard which has, over the years, been ascribed variously to maintenance error, supervision error, and design error. Fact is, it appears to be a statistical certainty that we're going to average nearly one in-flight throttle disconnect per year as long as we operate the T-bird with the present throttle linkage system. SIs, cautions, and special briefings notwithstanding – a permanent fix is what we need.

CANADIAN FORCES HEADQUARTERS
DIRECTORATE OF FLIGHT SAFETY

COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

MAJ M. D. BROADFOOT
FLIGHT SAFETY

LCOL H. E. BJORNESTAD
ACCIDENT INVESTIGATION

2 Flight Safety in Training Command
6 Good Shows
8 FOD is crippling us!
10 Flight Safety - 1910 Style
13 Injured?
14 Rescue in Training Command
16 Lower the rate in 68!
19 A Rose by any other name
24 From the AIB
26 On the Dials
27 Aircraft Ground Incident - CFP135
29 Gen from 210
32 Letters to the Editor

Editor — Capt J. T. Richards
Assistant Editor — Capt J. G. Christison
Art and Layout — CFHQ Graphic Arts

Flight Comment is produced by the CFHQ Directorate of Flight Safety. The contents do not necessarily reject official policy and unless otherwise stated should not be construed as regulations, orders or directives. Contributions, comments and criticisms are welcome; the promotion of flight safety is best served by disseminating ideas and on-the-job experience. Send submissions to: Editor, Flight Comment, CFHQ/DFS, Ottawa 4, Ontario. Subscriptions available from Queen's Printer, Hull, P.Q. Annual subscription rate is $1.50 for Canada and USA.

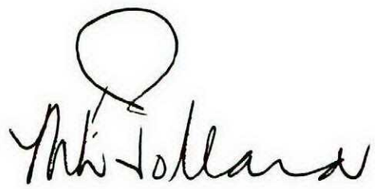
ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1968

SAFETY VS ENVIRONMENT

When the last Air Defence Command sponsored article appeared in Flight Comment in 1962, the CF101 and CF104 were being introduced into the Command. An increase in the accident rate due to this re-equipping was anticipated. It is to the credit of all ADC personnel, actively assisted by CFHQ and Materiel Command, that the accident rate did not increase but continued a steady decline during the next few years. This success was not due to good luck but was the result of a professional approach to the business of flying aeroplanes. This is the essence of flight safety.

In 1967 the accident picture was not so bright. Four accidents due to pilot errors resulted in three fatalities. Birdstrikes caused three other accidents. After a successful ejection a pilot drowned, possibly due to inadequate safety equipment or to inadequate ejection training. In analysing this record the common factor in all of the accidents is the ADC operating environment. Environment encompasses the whole circumstance under which aircraft are operated and maintained. This includes training requirements, aerodrome facilities, aircraft design limitations, technical and operating supervision, flying time limitations, equipment inadequacies and economic restrictions. Errors occur when pilots or technicians are unable to cope with the environment.

The aim of the ADC flight safety program is to reduce the hazards of our operating environment and to prepare personnel and equipment for this environment. It is not realistic to expect a zero accident rate within the scope of ADC flying operations but a reduction in the number of preventable accidents is possible. Supervisors who are directly responsible for flying operations or technical support are best qualified to recognize environmental hazards and to plan their operations accordingly. This is particularly pertinent under the present situation wherein economic factors affect flying rates, technical renovations and new construction programs. The responsibility for reducing these environmental hazards rests with all military levels. An effective flight safety program must define and eliminate or minimize the effects of these hazards.



MAJOR-GENERAL M.E. POLLARD
COMMANDER, AIR DEFENCE COMMAND

Flight Safety in Air Defence Command

by
the Flight Safety Officers of
AIR DEFENCE COMMAND

ADCHQ
Major J. R. Chisholm
Captain T. O. Cue

CFB COMOX
Captain R. L. Jensen

CFB COLD LAKE
Captain R. M. Wood

CFB NORTH BAY
Captain J. Kitchen

CFB BAGOTVILLE
Captain J. G. Hebert

CFB CHATHAM
Captain W. G. Willson

This article describes the results of the work of many ADC personnel on projects and tasks which have led to a safer flying environment in ADC. In many cases these projects became reality through the active support of Commands and formations outside ADC. The information presented in this article was prepared and co-ordinated as a joint project by ADC Flight Safety Officers.

Flight safety in ADC aims at reducing the hazards of the operating environment; thus, it involves preparing men and equipment for that environment. This means, for example, improved aerodrome facilities, better approach aids, and – to be realistic – more crash and rescue facilities. This is the practical approach towards the business of accident prevention. The essence of this aspect of flight safety is supervision, training, education, and observation. This article briefly describes some of the progress made in ADC in the hope that others may benefit or perhaps offer constructive criticism.

The problems associated with Air Defence Command tasks are many and diverse. The primary role of ADC is the capability for an all-weather CF101 operation over a large geographical area. The support or target flying for this role is also a demanding task. Another major responsibility of the ADC is low-level strike and reconnaissance training in the F86 and CF104.

An effective flight safety program must deal with these problems at all levels. ADC flight safety philosophy makes a requisite of an effective system of observation and corrective action at the unit. The responsibility for accident-free flying and maintenance rests primarily with unit supervisors; it is logical, therefore, that they should implement their own safety program to suit local conditions. Of course, support and advice must still be readily available from the command.

An important safety instrument is the base commander's Flight Safety Survey Checklist system. The checklists cover every phase of operation at a flying unit – both technical and operational – and have been prepared by ADCHQ specialists to reflect regulations and procedures. The employment of these checklists is done for the base commander by his own specialists, and may be monitored by the Base Flight Safety Officer or the Base Aircraft Maintenance Safety Officer.

Annual inspections by ADCHQ flight safety staff officers are usually made in conjunction with tactical evaluation team visits. Unlike the TAC EVAL report the flight safety report is presented privately to the base commander by the inspection officer. Only when serious deficiencies occur is further action taken as a result of these visits. The aim of this type of inspection is stated in its title – Flight Safety Assistance Visit.

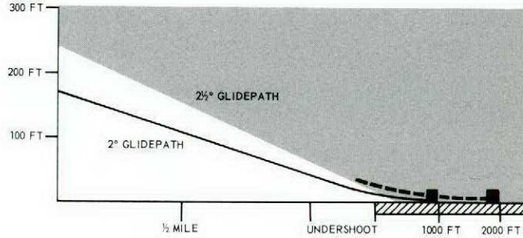
Some of these staff positions may be unique to ADC. The Base Aircraft Maintenance Safety Officer is a technical list officer whose secondary duties in aircraft maintenance and industrial safety parallel those of the BFSO in flight safety. The Personal Safety Equipment Officer is an aircrew officer whose secondary duties normally include the organizing of local survival training; this has become an important function in ADC. The Flight Surgeon is assisted in his work of aeromedical supervision by a Base Aeromedical Support Team whose chairman is an operational supervisor.

The remainder of this article outlines some projects pertaining to improvements in the ADC operating environment. The examples are from selected bases but in many cases are comparable throughout the command.

Airfield Approach Aids

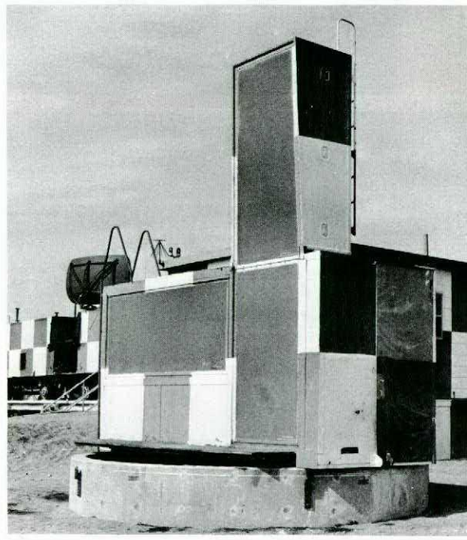
GCA 2° Glidepath

As a result of studies and field trials in ADC the advantages of a 2° GCA glidepath over the 2½° glidepath for century-series aircraft have become apparent. The shallower approach path leads to a safer conversion from an instrument approach to a visual landing in aircraft such as the CF101 with its high approach speeds and high rates of descent. It is possible that the adoption of the 2° glidepath may be achieved in 1968. The problem was described in the Mar/Apr 1966 issue of Flight Comment.



GCA Turntable

A project at CFB Bagotville has led to the development of an hydraulically powered turntable for the GCA antenna system. These turntables are currently being installed throughout ADC and in some cases permit a precision radar approach on all runways using the same antenna system.

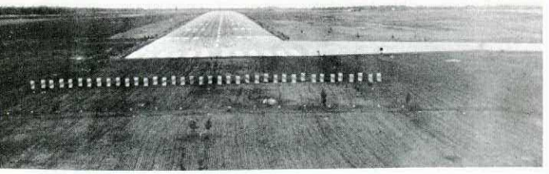


Sequenced Strobe Approach Lights

A shallower radar glidepath angle will place the aircraft at a greater distance from the runway threshold when at minimum instrument altitude. For the conversion to visual references the pilot requires good approach lighting which is available with sequenced strobe approach lights. Purchasing these lights has been approved although funds will not be available until the early 1970s.

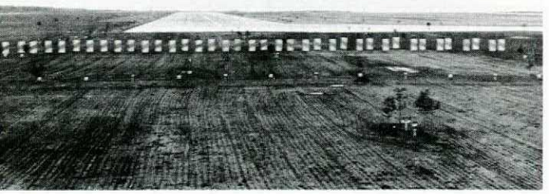
VASIS

Most military pilots are familiar with the Visual Approach Slope Indicator System which is currently in use. The main limitations of the system seem to be the intensity and the siting in relation to the runway threshold. These problems are currently being in-



Normal. . .

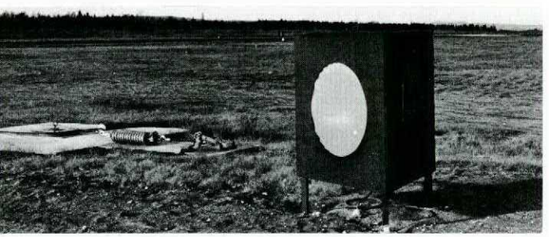
. . .too low



vestigated in ADC. At CFB Cold Lake the VASIS is at a 2° approach angle instead of the normal 2½° because it closely approximates the visual approach path of the CF104.

Runway Impression Fence

This installation is unique to ADC and consists of a double row of styrofoam pillars mounted near the runway threshold, offset to resemble a broken line when viewed from above. When viewed from a shallow angle the blocks give the illusion of a wall or fence between the pilot and the runway, indicating that he is lower than he should be. The impression fence is particularly valuable with snow-covered ground which hinders accurate depth perception. There has been only one reported instance of an aircraft landing short in ADC since the impression fences have been installed. This incident occurred when a T33 landed during a heavy rain which obscured the pilot's vision. One notable feature of the fence is that there is no requirement for interpretation when a too-low situation exists; it is immediately obvious and the pilot corrects almost instinctively.



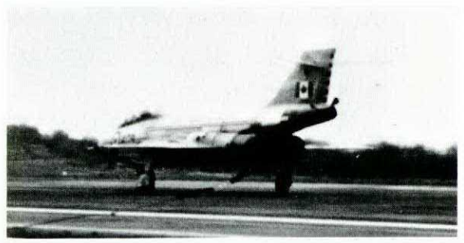
Emergency Facilities

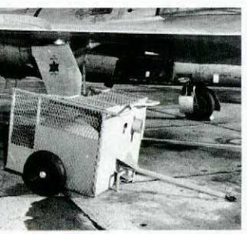
Barrier Marker Lights

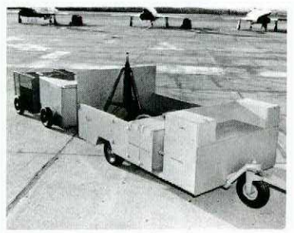
The photograph shows the type of marker lights built by CFB Bagotville to indicate the location of the runway barrier cable. The orange plastic disks are illuminated by two sealed-beam approach light units.

Barrier Resetting Procedures

Through constant practice, procedures have been evolved at units such as CFB Comox for the release of aircraft which have engaged the BAK-6 type of arrestor barrier – and for the resetting of these barriers. The responsibility for this task belongs to the construction engineering branch and is implemented by the crash rescue crews on many units. Some units can clear the runway and reset the barrier within 20 minutes of the engagement under reasonable conditions.







Crash Trailer

Whenever the runway is blocked by an aircraft with a malfunction, time cannot be wasted in delivering to the scene equipment such as undercarriage ground locks. The large wheels installed on the Bagotville crash trailer allow it to be towed quickly to any part of the aerodrome.

Brake Cages

Hot brakes can mean an explosion with damage to the aircraft and injury to personnel. Brake cages as well as tire deflators reduce the possible effects of this condition.

Aircrew Rescue

CFS Val d'Or was instrumental in perfecting a system for aircrew rescue from the cockpit of the CF101. The technique involves using the roof of the G19 crash truck as a rescue platform. This system will be effective for rescuing from the cockpit, injured or incapacitated CF101 crews when the aircraft undercarriage has not collapsed.

SARAH Search

The utilization of SARAH-equipped T33s in ADC has greatly enhanced the search capabilities of each unit. A procedure devised by CFB Bagotville for using two T33s in formation has proven effective. The crew of one aircraft carry out the SARAH search while the other crew tries to pinpoint the ground position visually.

Rescue Helicopters

Past experience has shown that the immediate availability of a helicopter is a necessity for the rescue of downed personnel. Injuries may make a quick rescue imperative especially during the winter. In one instance the lack of a helicopter almost cost the life of an injured CF101 navigator. Helicopters are now in use at all major ADC flying units.

Flight Safety Projects

Aerodrome Bird Control

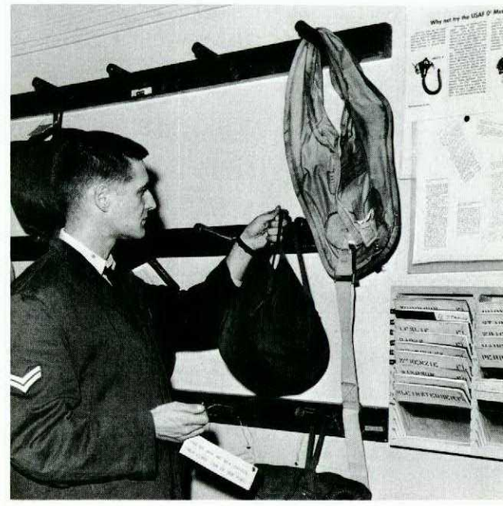
Bridstrikes continue to be a serious source of aircraft damage in ADC and resulted in the loss of a CF104 in 1967. An article describing the continuing study (at CFB Cold Lake) of migratory bird movements using radar tracking to supplement visual observations is included in this issue of Flight Comment. An active campaign of aerodrome bird control is being carried out at CFB Chatham by the BFSO. The three basic requirements for reducing bird concentrations around an airfield are; eliminate food sources; eliminate possible nesting areas; and, discourage birds by means of harassing tactics. Any reduction in efforts along these lines results in an increase of bird activity the following year. In 1967 Dr. Lewis of the Canadian Wildlife Service visited Chatham and made recommendations concerning the elimination of insects, berry trees and bushes, and swampy areas. These recommendations are being implemented in 1968.

Aircrew Survival Training

ADC has begun to place more emphasis on local environmental survival training for aircrew at each unit. An approach to the problem by CFB Cold Lake is described in another article by the Cold Lake BFSO. Water survival is part of the training and particular emphasis is placed on this aspect by CFB Chatham who lost an F86 pilot through drowning in 1967. One facet of the Chatham training methods is the individual treatment concept. Each man is given individual attention during half-hour sessions at the swimming pool by sea survival training instructors. Briefings and practical work are continued until the individual is able to demonstrate his ability to perform the necessary actions to an acceptable standard. This method has proved to be very successful and popular with the aircrew.

Personal Safety Equipment Storage

Routine servicing of aircrew personal safety equipment has always been a bind for aircrew due to the nuisance of carrying the equipment to the safety systems section. The obvious solution has been to service the equipment in the storage area which is located in the aircrew area of the flight-line. The benefits of this



416 Sqn (CFB Chatham)
safety equipment storage area.

system are manifold. In many cases the safety systems technician visits the flight every day and carries out regular checks and cleaning of masks and headsets. He is available for any adjustments or rectification of snags that might be brought to his attention by the aircrew. He also picks up and returns parachutes and mae wests that are due for periodic checks. To the aircrew the main advantage of this system is the sheer convenience; to the safety systems men there is no longer a need to prod reluctant pilots to bring in overdue equipment. Safety gains immeasurably because of the better maintenance of aircrew safety equipment.

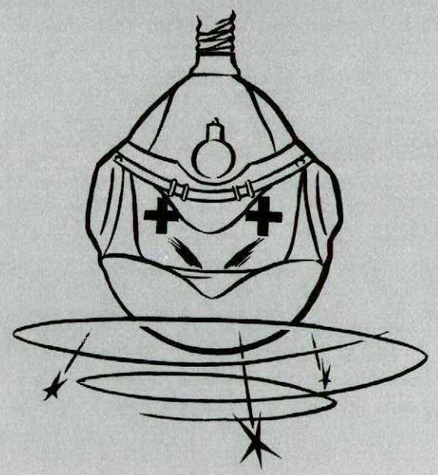
Few of these improvements were easy to achieve. In some cases it took years of diligent and persistent devotion to bring the problem to light and devise a solution. You will note throughout, the considerable involvement of virtually the entire base organization in the achievement and operation of flight safety measures. It is this cooperation which we acknowledge as being the foundation of our continuing work combatting the hazards of the operating environment.

Exchange pilot gets USAF/ADC Award

Major Griffiths, on exchange with the USAF/ADC, 37 Air Division, received the command's "We point with pride" award for outstanding flying when his T33 was struck by lightning. Buffeted by severe turbulence and temporarily blinded by the flash, Major Griffiths was able to make a safe landing minus his pitot instruments and a damaged SIF transponder which made ground radar assistance impossible in the heavy weather.

Major Griffiths reduced power and established a descent pitch attitude until he was in the clear. To the USAF award we add our Good Show commendations to Major Griffiths.

I wish I had . . .



eaten breakfast !

The old, old, story

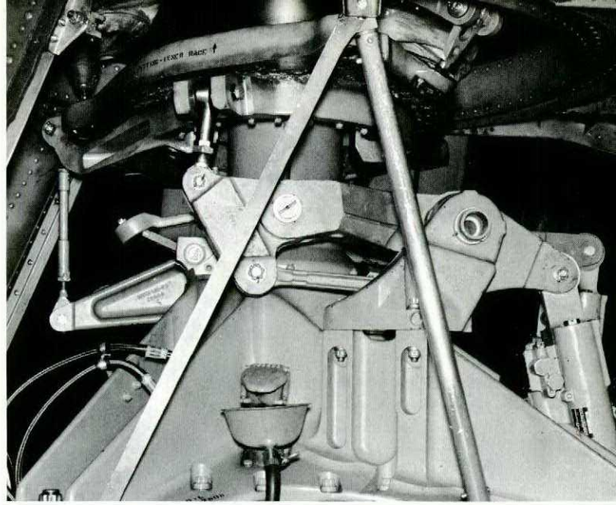
Murphy started this, but he had help . . .

Out for a test flight after a major inspection, a right turn was initiated during ground taxi but to straighten out even left cyclic and left brake were ineffective. The aircraft was brought to a hover to avoid collision with another parked aircraft, continuing its right turn in the air.

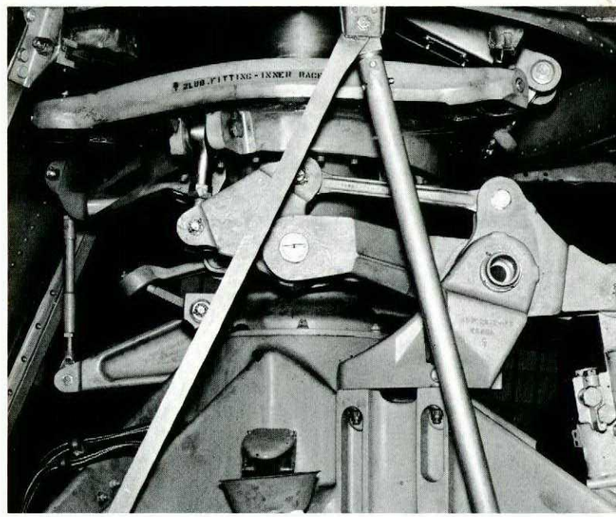
The aircraft was returned safely to the ground.

A bell-crank in the forward upper control assembly had been installed 180 degrees out of position by a technician who had done the job without the EOs. The crew inspecting the aircraft were taken off the job and a replacement crew took over. (This was done to allow the crew supervisor to proceed on leave.) In these circumstances of changing horses in mid-stream, so-to-speak, it was easy to overlook the murphied bell-crank.

The EO would have been of considerable assistance, particularly as this technician had never performed the job before.



Proper installation.



This improper installation could have caused a serious accident.

This isn't the first time . . .

A corporal was sent to hospital with a broken cheekbone and severe lacerations on the head – the *fifth* victim of a CF104 undercarriage door. After an undercarriage retraction test this NCO had pulled all the landing gear circuit breakers prior to connecting the landing gear forward door actuators, a job which requires entering the wheel-well. By entering the wheel-well area when both electrical and hydraulic power were connected to the aircraft, the corporal disregarded this warning in the EO: "Make sure that electrical power is off and system pressure has been released before entering wheel well". No one knows why the doors cycled but investigators concluded that momentary circuit breaker actuation by an unknown person to be most probable cause. The injury, however, was basically the result of disregarding the warnings in the engineering orders.

Good Show

CAPT J.B. ASTLEY

Following a touch-and-go landing with a pre-solo student, Capt Astley requested a closed pattern and was told to extend his overshoot before pulling up into the downwind leg. By the time he was cleared for pull-up he was about two miles from the runway at 300 feet above the ground. Applying full throttle Capt Astley commenced the pull-up when a loud bang was heard and the engine compressor stalled. (The compressor was damaged extensively by an unidentified foreign object.)

With little more than idle rpm available Capt Astley was able to get to 1200 feet above ground and the aircraft headed back towards base but he judged that a safe approach on the active runway was unlikely. Declaring an emergency, he requested clearance to land downwind. All other traffic was quickly cleared from the area. From his position Capt Astley judged that his airspeed would be too high for a safe landing and flamed out the engine on final.

Faced with an emergency which demanded quick thinking and presence of mind, Capt Astley successfully returned the aircraft safely to land in a display of commendable flying skill and judgement.

CAPT M.J. McDIARMID

Capt McDiarmid was captain of an H34 rescue helicopter which picked up a downed CF104 pilot in the winter bush north of Cold Lake. The pick-up, in the dark, was accomplished as a result of Capt McDiarmid's outstanding skill in bringing his aircraft, with its elementary instrumentation and no stabilization equipment, to a hover over blacked-out rolling forest terrain.

The absence of any SARAH signal and the fact that no fire was sighted created the impression that the pilot was injured. Capt McDiarmid knew that an injured man would probably not survive the night and was prepared to face the hazards of the pick-up.

Capt M.J. McDiarmid

Cpl W.E. Munden

After firing his last flare the pilot used wind-flamer matches. With these small pinpoints of light as his only guide in the rolling terrain Capt McDiarmid hovered his helicopter directly above the pilot and brought him to safety.

In an outstanding display of courage and flying skill, Capt McDiarmid displayed an exemplary devotion to duty.

CPL W.E. MUNDEN

While on a search mission in northern Saskatchewan as flight engineer of an Albatross, Cpl Munden was required to fix a fuel pump snag at an airport with minimum servicing facilities. On the run-up, the starboard engine caught fire. Quickly shutting down the engine, Cpl Munden was able to contain the fire in the engine accessory cavity with the flight-deck CO2 extinguisher. The fire damage was limited to electrical leads and the aircraft was returned to the search shortly after.

Had this fire not been promptly combatted we could have lost a valuable aircraft. Cpl Munden's correct assessment and quick response to the emergency reflects his competence as technician and crewman.

CPL J.G. PELLETIER

While working at the south barrier Cpl Pelletier noted some debris on the runway. Investigating further he discovered rubble consisting of pebbles and rocks up to 12 lbs in weight, spread over approximately 3000 feet of the centre portion of the runway. Unable to contact the tower when his FM radio malfunctioned he raced to the tower arriving just as two CF101s were taxiing to position for takeoff. The pilots were told to return to the hangars.

Cpl J.G. Pelletier

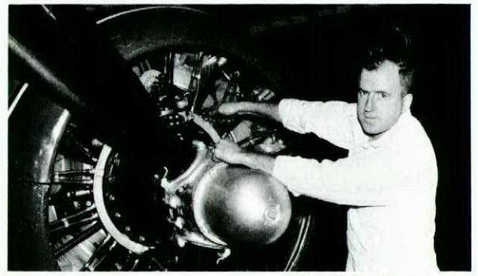
An inexperienced driver in a high-speed blower had deposited the debris on the runway; it was not visible from the tower in the fading light. A takeoff would have been very hazardous and certainly would have created serious damage. Displaying initiative and quick response to this emergency, Cpl Pelletier made a notable contribution to flight safety at his base.

CPL D.T. STEVENSON

As crewman on a Dakota, Cp1 Stevenson noted on the ignition analyzer some intermittent firing of a cylinder in the starboard engine. A ground run-up of the engine indicated it was serviceable; it ran smoothly and showed only a small rpm drop during the magneto check. Not satisfied, Cpl Stevenson first checked the sparkplugs, and discovered a washer lying in the cowling. Recognizing this as the type used with cylinder hold-down studs he removed the cowling and proceeded with a more detailed check.

His investigation uncovered another cylinder having two broken studs, three stretched and deformed studs, and the remaining studs loose. In other words – it was just about to fail.

Corporal Stevenson's alertness and initiative led him to discover only six months before a bird's nest hidden in the aileron hinge area. With these commendable acts Cpl Stevenson has proven himself to be a first-class technician and a valuable member of his unit.



Cpl D.T. Stevenson

Cpl J.J.C. Lamarche

Cpl J.D.G. Glennie

CPL J.J.C. LAMARCHE

While on a routine inspection of a CF100, Cpl Lamarche discovered evidence of hard-landing damage. The outward appearance of the damage was very slight and could be seen only in the form of a faint shadow when an inspection light was shone across the surface of the wheelwell side web. Cpl Lamarche's discovery resulted in further damage being found.

As no report of a hard landing had been filed, Cpl Lamarche's attention-to-detail brought to light damage which undetected could have caused an accident. Flight safety depends in large measure on the contributions of technicians of Cpl Lamarche's calibre.

CPL J.D.G. GLENNIE

Cpl Glennie, an admin clerk in charge of Cosmopolitan aircraft records, brought to light the hazards in some grossly-inaccurate records for the converted Cosmopolitan aircraft. Cpl Glennie spotted a number of errors in the lifed-item records of a newly converted aircraft and recognized this as a very serious hazard. With his participation in monitoring the correction of the records, flying was not interrupted and no significant increase in down-times occurred.

By uncovering this serious deficiency in aircraft records, Cpl Glennie made a praiseworthy contribution to flight safety.

CPL J.S. LEVETT

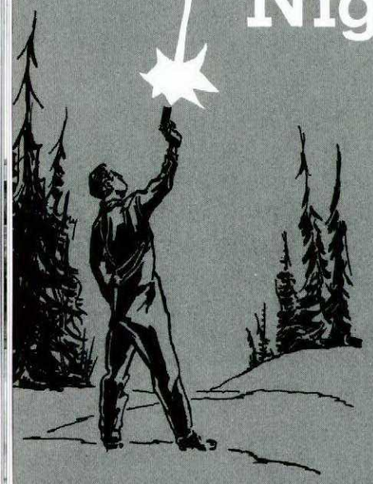
Cpl Levett removed the starboard auxiliary tank filler cap and took those extra few moments to visually inspect the tank's interior before fuelling the Dakota. He discovered a large amount of foreign material which turned out to be paint and primer chips. These foreign objects could easily have blocked the tank outlet resulting in engine fuel starvation. Additionally, some of the chips were already dissolving, which on reaching the engine could have caused damage or even engine failure.

Cpl Levett's commendable thoroughness prevented a possible accident. His visual inspection is not common practice nor is it required by engineering orders; this fact demonstrates that Cpl Levett's application and interest reflect a high degree of integrity. Often, it's that "little extra" that ensures the safe operation of our aircraft.

Cpl J.S. Levett

"I activated SARAH and was greatly distressed that I could hear no hum. . ."

Night Rescue



How would you respond to being dumped without warning into the northwoods in winter? This pilot was faced with giving priority to either his survival or rescue.

"At 1445 hrs I was flying at about 250 ft, at approximately 500 kts when a loud bang and a considerable jolt occurred. There was an immediate, complete power loss and deceleration of the aircraft. I zoomed, tried one airstart which was unsuccessful and then noticed my zoom began to top out at about 260 to 300 kts at about 4000 ft indicated; ground level was about 2300 ft. I believe I just started downhill, there was no temp or rpm rise, so I decided to eject instantly.

I pulled the D-ring, sensed the canopy go, and then I felt wind and a tumble. There was no hard jolt when the seat fired. In a few seconds I felt the chute tug me, looked to my left and saw the aircraft go in. I was floating down, drifting backwards and sideways to my right into some trees. I believe I was about 40 seconds in the chute. I retained the seatpack and went into the trees.

After hitting the ground I checked that it was OK, released the harness and opened the survival pack. My chute was up in the trees so I decided to leave it as a marker. I checked over the seatpack contents. The first thing I did was to read up on SARAH and then I took all the pack contents into a sheltered copse of trees about 35 ft away from the hanging chute. I started to warm SARAH under my arm and under my flying suit, and timed my expected time to turn on the beacon. While cuddling SARAH, I went as far as I dared in two directions, blazing trees, looking for a clearing of any sort where I might build a shelter and be in a better position to signal any search aircraft that might fly overhead. At 1600 hrs, I activated SARAH and was greatly distressed that I could hear no hum to indicate its operation. I kept lugging it around under my suit anyway in hopes that it might warm and start broadcasting.

About dusk (1715 hrs) I heard an aircraft in the distance and I fired one flare; apparently it was not seen. As much as possible I tried one-handed, a makeshift shelter building and was starting to get some firewood. However, because of my desire to keep SARAH against my body, I knew I would have to forego a two-handed fire building project and a good shelter. After I ran out of daylight, I was committed to keeping as warm as I could in the shelter of the trees, wrapping my lower body in the dinghy and sitting on the boughs that I had cut as a mattress. The lack of a flashlight prevented me from organizing the fire and a better shelter once darkness set in, plus my preoccupation with keeping the beacon warm and fully assembled in case it was partially operating.

After dark I heard some jet aircraft (1800 hrs?) and fired a red pyro. I heard the aircraft come closer and I fired another. Once I saw the T33 come by with gear down and landing light on, I knew I had been seen and was content to await further action by SAR. I saw the Dakota orbit, fired a few more flares, was surprised to hear the helicopter, and fired my last flare to give him the final homing. When I knew he was trying to spot me with his searchlight I went for the matches and had a try at setting a small evergreen on fire but there was no light up. As a last resort, I lit some matches and held them high. The helicopter then hovered immediately overhead with the spotlight on me. Down came the hoist, I got in the sling and was hauled up."

Whenever faced with the prospect of having to remain in the area, first build a shelter and a fire (RCAF Pamphlet 181). With shelter and warmth you are protected; for a bonus, the fire creates firelight and smoke – both good signals for the rescue aircraft. Ironically, this pilot was prevented from building an adequate fire, which would have actually been a better heat source than his body for warming the SARAH.

With night approaching the one stark reality becomes – *survival*. With a shelter and fire the pilot would have

(cont'd on page 23)

Aircrew Survival Refresher Training at Cold Lake

by Capt R.M. Wood
BFSO, CFB Cold Lake

Dark clouds swept in from the western skies and there was a threat of snow in the air as an H34 piloted by Capt Ervin Hamilton hovered into a small clearing near Grist Lake, northern Alberta . . .

Twelve pilots were being flown in for a three-day Survival Refresher course to this wilderness spot 70 miles north of CFB Cold Lake. Every six months about half of the aircrew instructors at the #6 Strike/Recce OTU spend a weekend in the woods to brush up on survival techniques under the guidance of Sgt Jerry Lane and his staff of para-rescue experts.

Nearly all the CF104 instructors have received at least one survival course at the STS, CFB Edmonton, but there is no shortage of volunteers to attend the Grist Lake refresher course. Each man knows the value of continual practice in the art of survival.

As the pilots disembark from the chopper each is given a sleeping bag of the type normally packed in the CF104 ejection and a piece of parachute. Quickly, they construct lean-to shelters and prepare for their two-night stay. The following day there are lectures and demonstrations on fire-making, signals and other survival subjects. The food procurement program proved to be very popular as the lake trout were biting well.

Capt W.T. 'Willy' Floyd, who supervised the refresher course, states that the semi-annual camps are an excellent way to keep up-to-date on survival techniques and become familiar with the problems one would have to face if he were forced to eject in northern Canada. He commented, "We spend most of our time flying a single-engined aircraft over uninhabited bushland, often at night and seldom more than a thousand feet above ground. In that sort of environment a serious emergency usually means a bailout without much likelihood of anyone knowing exactly where you are. Location and rescue could well take days. At 30-below a pilot would not have very many minutes to get into shelter so he must be prepared to act quickly. Walking out just isn't possible – it's a stay-put proposition. We feel that the refresher camps keep the pilots more aware of the problem they must face if they eject."

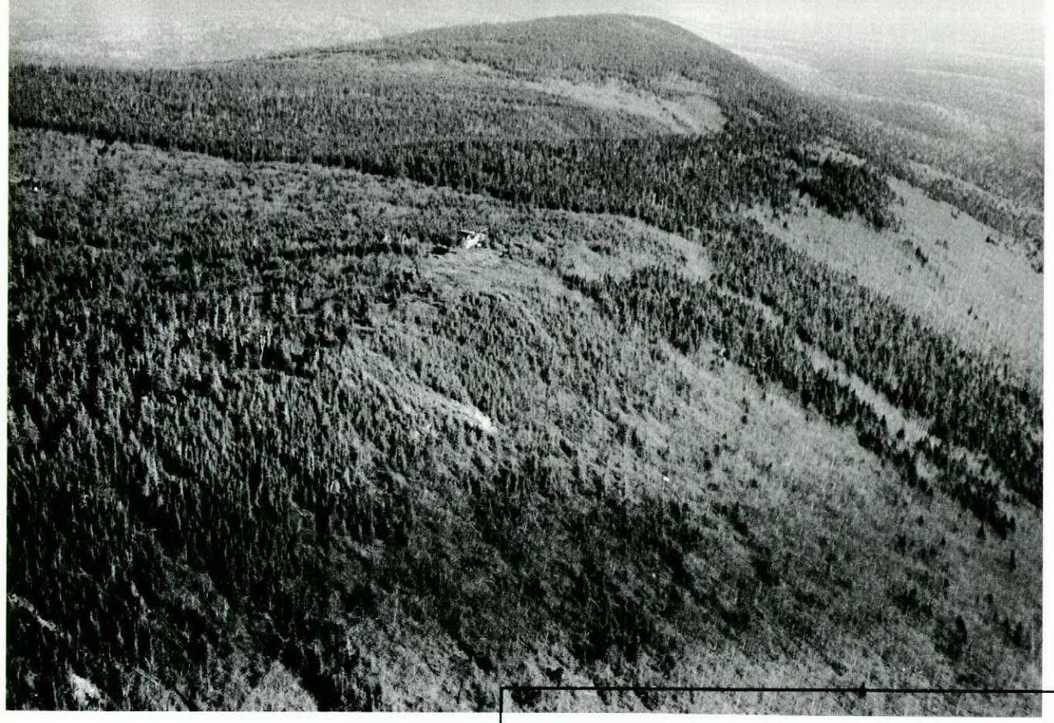
"Survival training does not form a part of the normal training syllabus at 6 OTU. We select students at random as they step out of an aircraft and take them into the bush with nothing but their flying clothes and the contents of the seatpack. The CF104 pilots are quick to appreciate the need to dress properly for our weather conditions and to think objectively about the ever-present risk of a few days in the northern bush!"

Instructors from 6 Strike/Recce OTU learn how to construct a one-man lean-to. Sgt Worsfold (extreme right) is a para-rescue expert and leader of one of the teams on constant standby at Cold Lake.
(Left to right: Maj Cebe-Habersky (USAF), Maj L. Coulter, Capt R. Dahl, Capt AL Seitz, Sgt G. Lane, Maj S. MacDonald, Capt W. Worthy, and Sgt K. Worsfold.)

Three OTU pilots watch a demonstration on building a lean-to by two members of the Cold Lake crash rescue team, Sgt G. Lane and Cpl J. Walton.

Maj E. Frioult demonstrates a warm-weather type of shelter. Easily built, it is not suitable for winter as heat from fire will not penetrate to the foot of the sleeping bag. ▽

Capt W. Ross catches 40-winks in his lean-to shelter △ made from parachute. Six inches of fine spruce boughs under his sleeping bag keep out cold and damp and make a most comfortable mattress.



". . .I saw cloud ahead"

"The mission proceeded normally until . . . I saw cloud ahead.
I was unsure at this point of the extent of the cloud cover
and whether it covered the higher hills ahead of me . . .
I descended a bit lower in an attempt to determine if
there was clearance between the hill and the cloud.
The area ahead showed up brightly . . .
I could see that the brightness appeared to be caused
by diffused sunlight showing through cloud.
I decided at this point that the hilltops ahead
were covered by cloud and decided to go on-top . . . "

Once on-top this pilot noted that the cloud was only eight to ten miles wide – a momentary interruption on a low-level exercise.

Minutes before, another pilot had been confronted by this small hill-hugging broken-to-overcast line of cloud. Electing to continue with visual reference to the ground – a requirement for this exercise – he struck rapidly-rising ground a scant 100 feet below the ridge top.

An above-average pilot who seemed to have a natural flare for this type of flying, he was in excellent health and in good spirits before the flight. Although short on jet hours he had several thousand to his credit.

Why had he pressed on? The cloud was unexpected; none was forecast. Also, witnesses stated that:

- diffused sunlight filtered through in spots giving promise of an opening ahead.
- the visibility in haze near the hilltops was extremely poor and deceptive.
- a snowfall covered the hilltop, visually blending the haze, cloud and ground.

Having already flown over ground with ridges that were as high as those ahead of him he may have had a false sense of security about the terrain.

Surely, there's sufficient evidence to convince anyone that when you're below safety height and in reduced visibility GET ON THE DIALS AND CLIMB IMMEDIATELY! Deteriorating weather with reduced visibility is insidious and deceptive – easily defeating the best eyesight. Hoper-groping for a break in the clouds ahead is too risky a game – when your life's at stake.

The Case of the Mystery Mod

We're reminded of a recent occurrence in which a fuel valve arm was found binding against the aircraft structure. In these aircraft, the majority of which had no clearance for this arm, a flange had been casually bent out of the way; in fact, most aircraft had been so modified. This design error created a hazard which had been tolerated over the years because an unauthorized mod seemed to have solved the problem.

The Directorate of Flight Safety building at the corner of Carling and Bronson has a large room at the back in which our flight safety statisticians work. Speak to Mr. Ken Dale, chief statistician, about the general picture and he'll tell you that most of our problems stem from an inability to learn from experience. Take a case recently on an unauthorized mod to a towing vehicle.

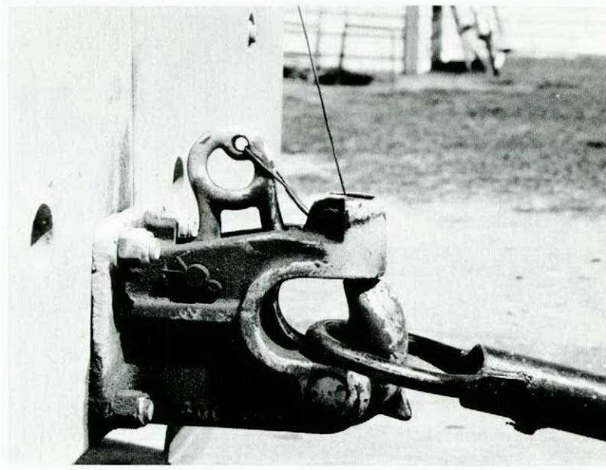
A few years ago Flight Comment published an article on a buckshee lanyard-operated remote hitch release. It sounded like a good idea at the time but the lanyard was too prone to accidental pulling – a real hazard when there's a heavy load behind. That's precisely what did occur; a passenger inadvertently kicked the lanyard, releasing the load which promptly struck an aircraft.

The most recent occurrence was like the first – another unauthorized mod. For a while it worked as designed, but one day the driver decided to adjust the seat, – yes, that lanyard was attached to the seat. Anyway, a load again came free – and struck an aircraft.

If the idea's a good one, sell it the proper way. In the meantime, help stamp out mystery mods.

Moving the seat forward pulled the lanyard . . .

. . . which released the hitch.



LCOL S.S. Whetstone, BTSO, makes the presentation at St Hubert.

$120 for a good idea

An earlier Flight Comment article gave recognition to then-LAC C.H. Williams' idea for a FOD and utility tray. Now, (after much support and research by DFS), we are pleased to see that a suggestion award cheque had been approved for Cpl Williams. The tray he designed is now in wide use in the Canadian Forces where it is causing lots of non-accidents. Congratulations.

The Crowded Sky

Mr. Blokpoel adjusts a timed-sequence scope camera. Speeded up for viewing, the film shows bird flock movements and intensities.

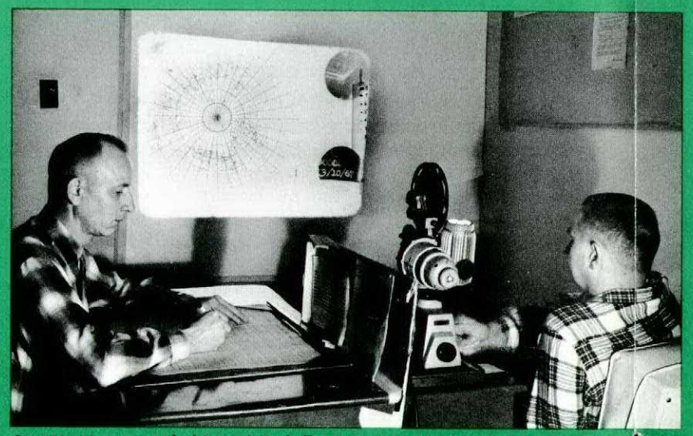
Air traffic and air speeds tend to increase but unless bird numbers decrease – which is unlikely – birdstrikes will be more frequent. This makes some people feel uneasy.

The Canadian Forces had 656 birdstrikes from 1964 to 1967; most of these caused only minor damage or merely left bird remains on the aircraft, but *seven aircraft crashed* after ingesting one or more birds. Of the several other aircraft which crashed for unknown reasons, birds may have been involved. (The painstaking technique of detecting bird remnants in crashed aircraft was described in Flight Comment, May/Jun 1967.)

Birdstrike prevention measures are applied to two environments – around the airfield and enroute. For this reason, research is being conducted in these two distinct areas. We shall discuss here only the enroute birdstrike problem.

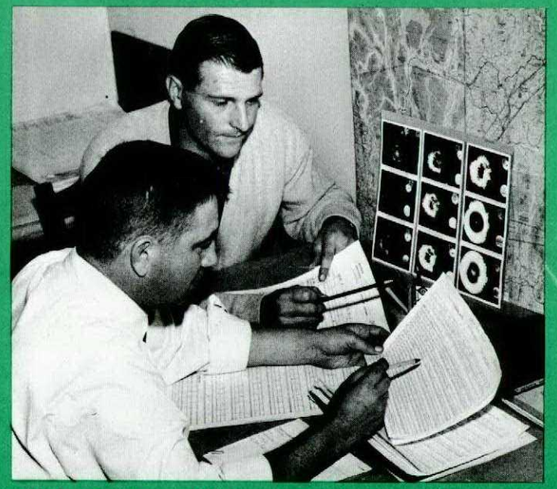
We know that during migratory periods huge masses of birds invade the sky. These migrations are most pronounced from about mid-April to mid-May and mid-August to the end of October – at least in the CFB Cold Lake region. As hunters know, on some days there are many more birds flying overhead than on others. By now, it's a well-established fact that bird migration intensities fluctuate; peak days with massive bird movements are followed by lulls during which relatively few birds fly. We know, also, that these patterns are greatly influenced by atmospheric conditions. The logic of our approach is, therefore, first to identify – and if possible predict – these few peak days and so advise the flying program supervisors.

Civilian officials are also concerned about the damage and hazards of birdstrikes. Six years ago the RCAF, the Department of Transport, the commercial airlines, the Canadian Wildlife Service, and associated civilian agencies, agreed to pool resources and knowledge. This led to the establishment of the National Research Council's Associate Committee on Bird Hazards to Aircraft. This committee, headed by Mr. M.S. Kuhring, has been and is at present evaluating all possible ways to reduce the bird hazard. A prime example is "Operation Bird Track" – an attempt to relate bird migrations with weather. The project is headed by Doctor W.W.H. Gunn, well-known for his bird and wildlife recordings. The project's aim is to set up a practical bird warning forecast system and publish a manual on forecasting bird migrations.



Sgt W. Newman (left) and Cpl P. Barr, members of "Bird Track" data reduction team, assess a film for intensity of flow, direction, size of echoes, etc. This information is coded for punch-cards.

CFB Cold Lake was chosen for Operation Bird Track; it has a radar unit, a meteorological forecast office and photography facilities. The area is heavily populated by many species of birds. Most important, Cold Lake has a compelling reason for birdstrike avoidance; high-speed, expensive, CF104s train in the region in the same height bands commonly used by migrating birds.



Cpl P. Desfosses (top) and Cpl J. Cunningham prepare coded "reports" which are put on punch-cards for storing. The scope photos on the wall are samples of bird "echo" intensities from 0 to 8.

The radar scope display gave us a tool far more efficient than the binoculars generally used by bird watchers. Also, recording equipment automatically provides total coverage day and night. This continuous monitoring was obtained by employing cameras to photograph the radar scope display (see photo). Both stills and motion pictures may be taken.

The BMetO Mr. W.R. Fryers began forecasting bird movements in 1964 from still photographs of the radar scope. These predictions were based on the premise that birds tend to fly pressure patterns. Although a remarkably high accuracy was attained (Time, March 17, 1967) the lack of basic ornithological (bird) data was deeply felt; forecasters were reluctant to predict bird movements without a supplementary knowledge of ornithology.

Since January 1965, Cpl P.P. Desfosses and his volunteer team have viewed and assessed miles of film in their time off. This small group has been able to cope with an increasing volume of film from various radar stations across Canada. Assessing involves identifying bird movement events from the general flow of echos to determine direction, duration, and intensity. It became clear soon ofter the project was initiated that the correlations sought after were complex. Every month piles of punch-cards containing bird data, along with weather punch-cards, are mailed to McMaster University in Hamilton. Mr. John Richardson, an ornithologist, has written a computer program for analysing the bird-and-weather data. From this, we hope to get our first factual and detailed insight into how weather influences bird movements in the Cold Lake area.

Another basic question remains unanswered. How many birds, in what formation, of what species and at what altitudes are responsible for what blips on our radar films? In August 1967, Mr. Blokpoel joined Operation Bird Track to do visual observations, with emphasis on pelicans which appear clearly and regularly on the radar display. He spent the evenings watching for birds as they passed silhouetted against the moon. An experiment was conducted employing the visual observations of fire look-out wardens in the area covered by the radar. These were attempts to relate the various degrees on our own intensity scale to a confirmed number of birds aloft.

Our studies show – at least in the Cold Lake region – that migration occurs on a wide front usually at night, generally peaking about midnight. Enough records exist to give us the year's patterns of bird migration intensity. Areas surrounding the base experiencing the heaviest bird concentrations have been pinpointed. Radar height-finders give us a fair idea of height distribution above the 1000-foot level.

Up to this stage in the project, the emphasis has been on collecting as much information as possible. For its part, the military now impose airspeed and altitude limitations – or may even suspend flying on occasion. Although the system is gradually improving as our knowledge and understanding increase, the work is painstaking and can proceed only at the seasonal pace set by nature. The large number of bird species involved are, in turn, influenced by a complex phenomenon in itself – the weather. The results we hope to achieve cannot be attained overnight but all of those participating in this pioneering work receive a double satisfaction from every gain – saving lives and aircraft, and extending man's knowledge of the behaviour of birds.

Similar operations are now underway in Holland, France, Germany and Belgium; these activities have led to improvements in Canadian techniques. As birds have not as yet shown nationalistic inclinations the present degree of international cooperation augurs well for greater safety in an increasingly crowded sky.

Birds, birds, birds. . .

This base thought it had the bird problem well in hand – and they were right, until construction turned the airfield into an enormous dinner platter for birds. Note the heavily-wetted soil which drove worms and insects to the surface. Could this happen to your base this summer?

CLOSE CALL

OPERATIONAL HAZARD

SAFETY SUGGESTION

Would you believe . . .

T33 aircrew and groundcrew are becoming a bit too complacent about ejection seats. Today, I failed to check the pins before climbing in and after much pushing, pulling and fumbling during the strapping-in process (inevitable in winter flying gear), I discovered the seat-pins were not in place. It shook me up a bit.

It was my responsibility to see that the seat is safetied before climbing in and also before leaving the cockpit after the flight. Both the last pilot to fly the aircraft and myself failed to do this. Also, it's the groundcrew's responsibility to ensure that the pins are in on the BFI – for their own safety as well as preparing it for the next flight. This, they failed to do.

I suggest all of us – aircrew and groundcrew – think about our safety habits around these seats and perform checks as they are laid down before someone takes a trip into the low overcast or a hangar roof.

Amen!

(An anonymous pilot submitted this CF212. Thanks for pinning this one down by writing it up.)

For flight safety officers only?

Maj L. Reid
SOFS/ATCHQ

If your wife ran into a hydrant...

For Flight Safety Officers Only?
Now that I have *everyone's* undivided attention (!) let me apologize for the ruse and invite you to read on . . .

The scene is the parking lot of a local shopping centre. A housewife, with more haste than caution, bashes the front right fender into a hydrant. The most serious damage was to the lady's pride and composure; the fender nonetheless would require repairing. Convincing herself that the damage was negligible, she drove the short distance to her home and parked in the driveway. The thought of mentioning the incident to hubby crossed her mind but she reasoned "Why provoke him with trivialities?"

At this point fate steps in. Soon after her return, hubby decides to slip over to the in-and-out store for a six-pack. Never one for pre-flighting the family wagon, he leaps in and is on his way. You may have guessed the rest of the yarn by now; anyway, here's the brutal ending. The "minor" bash had, in fact, forced in the fender restricting the turning of the front wheels. This becomes evident only when unsuspecting Dad attempts a quick turn to avoid a cyclist. Fortunately, nothing more than a near miss resulted – plus, a ruined 750 x 15.

Both types of investigation are nevertheless the sum-and-substance of aircraft accident prevention. Post-mishap investigations, although after-the-fact, do determine cause factors to prevent a recurrence. I reiterate therefore, that both methods of investigation are aimed at accident prevention.

I have mentioned briefly several of the pre-mishap investigation methods that are currently in use – the incident report, Safety Comment, and the UCR. There's another – the safety survey. If the town engineer had been alerted to the hydrant hazard he would have relocated it or had the curb extended. The chain of events would have been broken, preventing this mishap.

CFP135, Flight Safety for the Canadian Forces, contains a guide for FSOs to conduct a safety survey. Also, ATC Technical Instruction 00-80-1/2 dated 15 Aug 67 gives the terms of reference for the Base Aircraft Maintenance Safety Officer and provides checklists for safety surveys within the maintenance complex. These instructions cover the area that has been loosely described as the *ground side* of flight safety. The BAMSO, while working with the BFSO (who covers the *air side*) becomes an important member of the flight safety team.

It is not intended that these officers should carry out the surveys on their own; the surveys should be called for by the staff officer concerned and carried out by his delegates. BAMSO and BFSO are thereby free to monitor the overall program and to pursue action on survey recommendations.

Let me hasten to point out that the Safety Surveyor is not a spy attempting to catch anyone off-guard, nor should the safety survey of a particular section be made in surprise. In order to derive maximum benefit from the program, the checklist should be presented to the section some time in advance of the actual survey. A conscientious supervisor will ensure that his section meets the minimum standard as prescribed in the checklist. If the survey confirms this, its aim has been achieved.

The earlier "minor" mishap could have caused a much more serious accident. The moral of the tale should also be clear: complete and prompt reporting of even minor occurrences prevents accidents. This is also true of vehicle or industrial safety. That is why reporting forms are readily available and simple to use.

An incident report (CF215) is only one of several ways to prevent an aircraft accident. The UCR, and Safety Comment form (CF212) are other examples. Each of these items arises from a **pre-mishap** investigation. If they are used to report *every* potentially dangerous situation or hazardous condition, many accidents will be nipped in the bud – eliminating the need for a **post-mishap** investigation.

Let's apply these terms to our story. In every accident there's a sequence of events leading to the occurrence itself. The town engineer, by positioning the hydrant at the curb, unwittingly contributed to the sequence of events. By not allowing herself more time to shop, the wife became hasty and incautious. Look at any accident and you'll find a sequence of events leading to the ultimate occurrence. Seeking out these factors for elimination is pre-mishap investigating. (Incidentally, there's ample evidence to prove that the elimination of just one factor in the chain will prevent the accident.)

If we fail to recognize a sequence of events building up, the inevitable accident cannot be prevented. It is then that we must work backward in time to find the cause – the post-mishap investigation. Post-mishap investigation reports are called the CF210 and Board of Inquiry. We all realize that from a purely economic standpoint the cost of doing this type of investigation far exceeds the relatively meager cost of processing a pre-mishap investigative report.

Of course, the job is a never-ending one; in order to eliminate potential accident cause factors the survey must be repeated. Let me add before concluding, that the safety survey checklist items may be modified to the needs of the particular base, bearing in mind the ultimate aim of the survey.

To sum up:

- Every aircraft incident is significant enough to warrant reporting.
- A sequence of events precedes every aircraft accident; break the sequence and in all probability the accident will be avoided.
- The Safety Comment, UCR, Aircraft Incident Report and safety surveys are pre-mishap investigation devices. Use them frequently to help reduce aircraft accidents.
- Whenever we fail, the post-accident investigation will uncover the cause factors. The findings are used as future accident prevention devices. Post-accident investigations are reported on Form CF210 and/or CF211 (Board of Inquiry).

We need a continuing prevention campaign aimed at getting to that *next* accident before it can occur. And why not? – it's our country's resources and maybe our very lives that can be saved.

CLOSE CALL

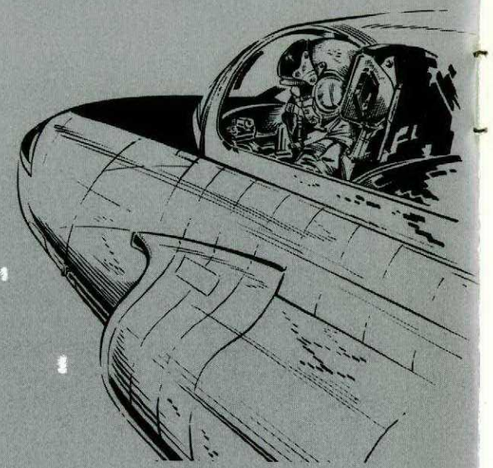
OPERATIONAL HAZARD

SAFETY SUGGESTION

The story of a tragedy "The Long Weekend" brings to mind the understandable susceptibility of pilots to accept the less-than-ideal conditions of limited facilities, reduced maintenance capability, etc, that prevail over weekends. Too, being away from home base there's the urge to get home and also to have the bird available for its normal function. These circumstances could easily compromise good judgement; our records show this to be the case.

— Flight Comment

As luck would have it. .



Circumstances – mostly minor and some twenty in all – slowly eroded two pilots' chances for getting to destination alive.

Late Sunday afternoon and darkness was setting in. On a fuelling stop at a non-military airport on a long-range navigation trip two T33 pilots faced with a delay went for a light meal. The captain (a T33 instructor with limited experience) and his student who was approaching wings standard, finished their meal and walked to the weather office and flight planning. A snowstorm had moved into the area; heavy snow was forecast to cause rapidly deteriorating weather. Destination was forecast to go down so the captain was quite anxious to get airborne; already, the encircling gloom was threatening his white ticket limits. Too, he was scheduled for the first lift Monday morning. The walkaround revealed the starboard tiptank cap sitting askew in its mount. The aircraft had not been replenished with oxygen. No groundcrew could be found so the pilots climbed aboard out of the cold intending to have the tiptank cap replaced when someone showed up.

Angered by the delay at the poor servicing, the captain in the back seat sat glumly pondering the service, the weather, and his overwhelming desire to be anywhere else but here.

By now the snow was coming down heavily.

Out at the runway's end the pilots ran into difficulties lining up due to the snow cover; it was this directional control problem on takeoff which distracted the pilots from checking – among other things – the tiptank lights.

The tips didn't pressurize as hoped-for and as the 1000-foot remaining marker whizzed-by the captain remembered the cap.

Then the vise began to tighten.

First, there was heavy icing during climbout, then came the alarming realization that the fuel emergency would force them to recover at point of departure. As they commenced descent from 20,000 the leading edge tanks went dry. With weather reported at 900 overcast 1¼ miles in heavy snow the captain called for radar assistance to jettison tiptanks should the first approach be missed. The emergency rescue crew was alerted.

In the inky black a pre-landing check was completed at initial level-off; one of the gear was agonizingly slow in indicating down – probably from the icing.

After passing the final ADF fix the radio compass fluctuated and settled on a heading approximately 20 degrees off. Suspecting a faulty radio compass the pilot requested ranges from the field, dropped the aircraft to minimum altitude early and maintained a heading to the airport. (PAR or ASR was not available at this field.) They were on track when the runway was spotted. Heavy on fuel (456 gallons), the captain maintained 150 knots until over the approach lights then pulled off power and shouted for the student to fully open the canopy. As the runway was much shorter than he was accustomed to, plus the likelihood of poor braking, he employed aerodynamic means to confine his landing roll to 4000 feet.

In recounting his "nerve-racking experience" the captain felt that a few ounces of prevention would have saved him the pounds of peril he'd encountered. Anxious to beat the weather and frustrated to the point of distraction, he had overlooked the tiptank fuel cap and had pressed-on in a flight where even directional control on the runway was difficult.

(Thanks for passing along your experience, that others may learn – and live.)

The BFSO queries a technical point with the ATRI's OC, CWO J. Kolisnek.

Aircraft Technical Research and Investigation –and the BFSO

by

Capt R.M. Wood

BFSO, CFB Cold Lake

A pilot reports he had no undercarriage indication on final. A report like that can start a flurry of questions. What was the cause? How many similar incidents had we had on the unit? Is there any proposed special inspection or is it just an isolated incident?

To whom does the BFSO turn for an answer? The OC Repair and Rectifications . . . the OC Servicing . . . Log Control . . . his own files . . . BTSO's office?

Many bases now have a central agency that can answer all the BFSO's questions and assist him in the technical aspects of his duties. This part of the technical organization is known by various titles; at Cold Lake it appears on the org chart as Aircraft Technical Research and Investigation (ATRI).

ATRI was created to provide the CTSO and SAMEO with independent investigations for accident and incident reports on the substantially more complex CF104. Also, it became necessary to compile statistics on component failures and unsatisfactory conditions, and as part of the corrective action, to issue unit maintenance instructions, and initiate local procedures aimed at preventing accidents. The ATRI evaluates proposed modifications and special inspections as either corrective action or for general aircraft improvement.

As a result of this evolution the present duties of ATRI are: " . . . to coordinate technical investigations and processing all CF210s, SRs, UCRs, draft L68s, L69s, TFRs, and UMIs. ATRI will coordinate and report on special projects detailed by higher authority. ATRI will maintain a register of air and ground accidents and incidents by aircraft and trade."

To assist in the technical investigations as well as acting as watchdogs on the condition of unit aircraft, ATRI has a quality assurance section. *Quality Control* also survey unit aircraft when an investigation reveals a potentially dangerous situation, or when so requested by higher authority. There is a comparable section in the Avionics Service Officer's organization to assist on projects having avionic implications.

So much for the ATRI organization. How does the BFSO fit in? ATRI is his liaison with the aircraft maintenance organization. This is further enhanced by having the OC of the ATRI as Base Aircraft Maintenance Safety Officer. ATRI can also bring the aircrew point-of-view into a proposed change in procedure or modification via consultations with the BFSO.

A maintenance research section similar to ATRI can save a BFSO many hours of legwork and head scratching in the technical aspects of his duties.

BFSO and Sgt R. Allen of the instrument lab, discuss an autopilot malfunction investigation.

The BFSO and MWO A.G. Morran of ATRI discuss from the pilot's point-of-view, a proposed cockpit mod on the CF104.

MWO A.G. Morran, Cpl P. Kellehar, and Cpl E.V. Mitchell list part numbers for an incident report.

An inadvertent bomb-drop is discussed by MWO A.G. Morran and Sgt L.S. Mitchell of ATRI, with Sgt S.L. Walker (centre) NCO i/c Base Weapons (Air) Section.

Eliminate the reasons for flying accidents

Do Canadian pilots have "...shortcomings in political indoctrination..."?

Col-Gen AA Mironenko
(and thanks to RN Cockpit)

Being a Hero of the Soviet Union as well as being dubbed Honoured Military Pilot of the USSR, makes Colonel-General Mironenko an influential man. Here are some of his views on flight safety excerpted from an article which appeared in a Soviet military journal:

We decided to look into this in order to be able to develop measures which would not only do away with casualties, but the reasons for them as well. This was the objective in holding systematic seminars in the sub-units, and in meeting with crew commanders. Their work habits, directed at providing for accident-free flights, were widely discussed, as were suggestions for improving the organization of flight operations as a whole. The seminars, the frank discussion, the detailed analysis of the facts of everyday life, convincingly confirmed the correctness of the opinion that flying is an art, one which has no limits of perfection, that flying is a complex and multifaceted process in which everything is of identical importance and significance.

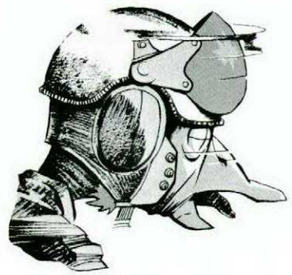
Flying and lack of discipline are implacable enemies. When there is lack of discipline, blood must flow. That is why lack of discipline is considered to be enemy "number one" among pilots. Enemy "number two" is indifference and nonchalance...inadmissible, is lack of system in training, particularly in instrument flying, poor grasp of aeronautical engineering, of the laws of aerodynamics (particularly those applicable to the pilot's own aircraft), haste, lack of demands imposed on one's self and on crew members, lack of self-control, conceit and self-confidence, violations of the training methodology.

Experience reveals that the most frequent violations occur among the crews of flight leaders, beginning with detachment commanders, and higher. The more senior the commander, the more marked are these shortcomings. This is no accident, because the leaders, occupied with their men, fly less. Moreover, some leaders often fly with different, as well as mixed, crews so the necessary mutual understanding and close-knitness is lacking. Flights such as these are seldom successful. A second group of reasons for flight accidents is connected with the actions of commanders and of crew members. These include overestimating personal capabilities, and excessive self-confidence, counting on old knowledge and experience, lack of discipline, carelessness, disregard for precautionary measures, a feeling of false shame, and the attempt to cover a mistake made in flight, something which only rarely fails to result in terrible consequences.

Unfortunately, not all leaders have passed along their wealth of flying experience in the modes and methods envisaged by the instructions, and other documents, to their subordinates.

Another group of reasons involves, in our view, omissions in the work of the Aviation Engineering Service and flight support. For example, the low level at which the conduct of maintenance day adjustment work is organized, the preliminary and pre-flight preparation of aviation material, superficial analysis of reasons for failures of equipment, and a number of other reasons... We think most of these reasons are connected with the presence, in certain of the sub-units, of shortcomings in political-indoctrination work on the part of commanders, political workers, Party and Komsomol organizations, as a result of which there appear as well the facts of unworthy conduct of individual servicemen in the way in which they live, disciplinary infractions, irresponsibility, and a reduction in the requirements imposed by various categories of commanders. The history of our people, and the glorious road taken by the Communist Party of the Soviet Union, are indicative of the fact that the Communist ideology and the convictions of man are the strongest and most terrible weapons in the struggle with any enemy, in overcoming any difficulties and shortcomings. Only ideological conviction will ensure a high degree of activity and purposefulness, responsibility for an assigned task, and only ideological conviction will help in finding within one's self the courage and the composure so necessary in the military pilot, in order to become indoctrinated with persistence, with the capability for overcoming any obstacles along the path to resolving tasks, and, in battle, to winning the victory. The man who is convinced of his ideological indoctrination will not break under any stress. However, if this idea is to be converted into deep, personal convictions, if it is to be embodied in the deeds of people, what is needed is painstaking systematic, political-indoctrination work with subordinates.

Who needs breakfast



(or lunch)?

A near tragedy in one act—

Dramatis Personae: A young jet pilot and a totally inexperienced non-flying type.

Scene One: Jet trainer cockpit, climbing through 8000, mid-afternoon. *(Pilot notices a flickering of his vision followed by hot flushes and cold chills. He is, throughout this experience, gripped with a feeling of elation and euphoria. Puzzled at first the pilot regains his composure and notifies tower that he is in a descent. The light-headed dizziness continues for a short time after landing.)*

Scene Two: MO's office

Doctor: *Well?*

Pilot: *As you know, I reported sick for a cold a week ago and two days later was returned to flying. I noticed a popping in the left ear and slight sniffles; however, I didn't report this as it wasn't serious. I think the problem really stems from what happened to me last night and earlier today. I was unable to get to sleep until 4:30 this morning which left me somewhat tired. I had no difficulty with the first two trips; it was just this third trip that really got to me.*

Doctor: *Why would this be so?*

Pilot: *I topped that few hours sleep with a couple of cups of coffee for breakfast.*

Doctor: *And lunch?*

Pilot: *A sandwich and a coke.*

Doctor: *Hm-m-m...* *(doctor performs several tests and finds all is normal.)*

Pilot: *(walks out of office – a wiser man.)*

Doctor: *(writing) Pilots should be reminded of the importance of adequate sleep and nourishment prior to flying. Any problem of a medical nature, no matter how minor, should be reported to the Flight Surgeon. This is particularly important when flying alone or with another unable to assume control of the aircraft should an emergency arise.*

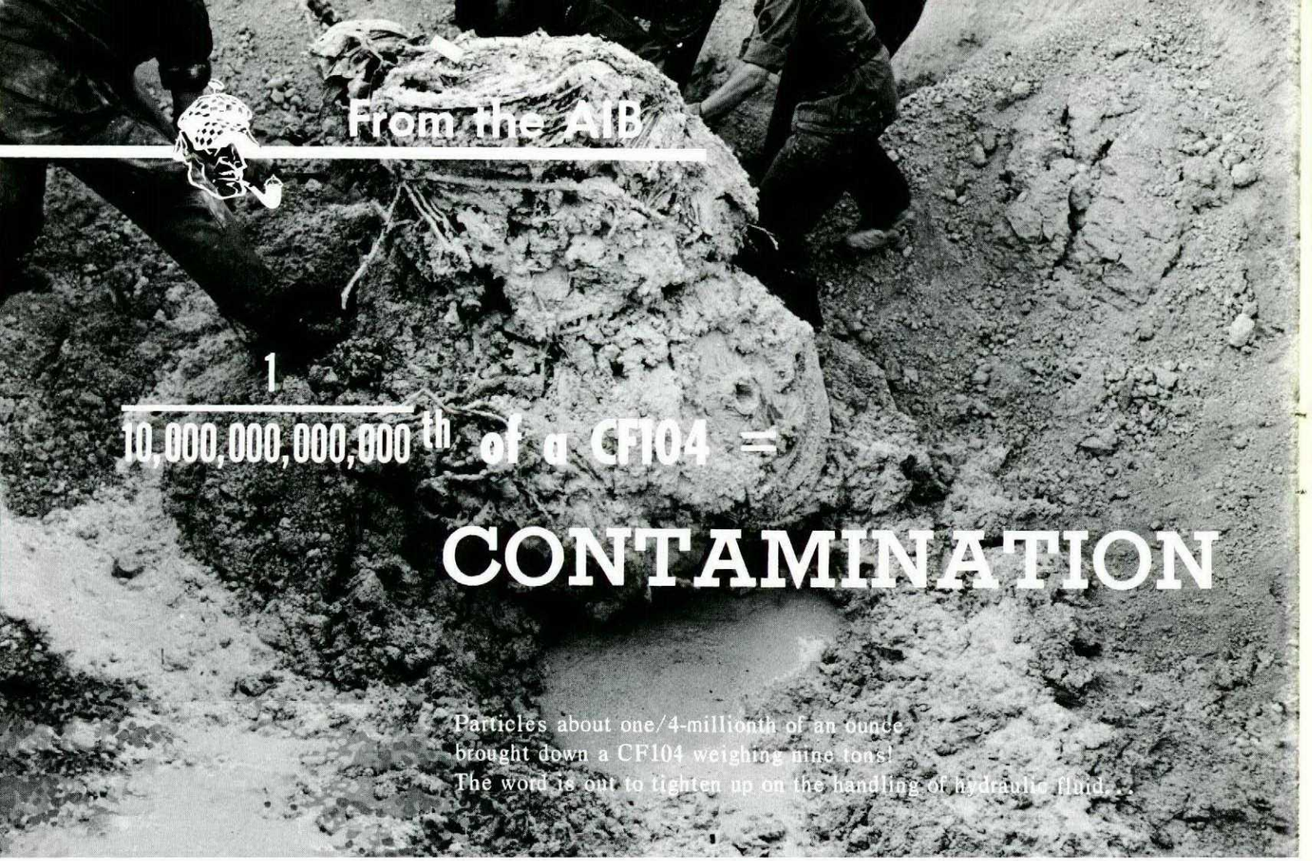
– CURTAINS (gulp!) –

Caution, Grubless Starvelings!

"At nine in the morning I got airborne with a student on an IFR flight. The weather was a little worse than forecast so the instructional trip became a practical one; moderate turbulence, heavy showers, and ceilings on limits, required all my attention to ensure a safe flight. I was under a good deal of pressure from the weather with a student at the controls whose basic instrument scan was weak, so I was using nervous energy at a good rate.

I had breakfast at 0700 hours but by 1100 my stomach began to rumble. At 1145, on a flight longer than I had anticipated due to holdings, I began to experience what I believe was a shortage of sugar in my blood, for I began to feel weak and I had the sensation that both hands and feet had gone to sleep. I relaxed as much as I could in the turbulence to conserve myself but without much success. Fortunately, at 1200 the trip terminated..."

(We're grateful to this pilot for calling everyone's attention to a continuing problem with aircrews. Don't forget, high-protein breakfasts release energy over a longer period of time. A high sugar and carbohydrate breakfast such as pancakes and syrup, toast and jam, and coffee will rapidly release energy – but not for long.)



Aircraft designers have unwittingly achieved a remarkable duplicate of a bird. Nowhere is the analogy more striking than in the metal bird's circulatory system. Carry the analogy one step further and you can liken contamination particles to viruses...

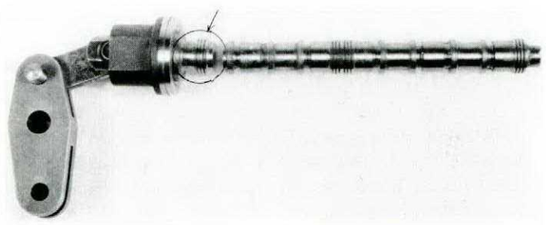
If you're an accident investigator you would be one of the first to learn that a 104 has been lost. From the first sketchy report it looks like another puzzler: *"The accident occurred during a low-level run-in on the bombing range. The pilot was heard to report that he experienced control problems and was pulling up. He subsequently ejected..."* The words "control problems" and "ejected" mean this one will be a tough nut to crack – at least, it would have been but a couple of lucky breaks gave us the answer.

Strongly suspect from the outset was the hydraulic system – and hydraulic systems are an investigator's headache. They're complex, delicate and easily scrambled on impact.

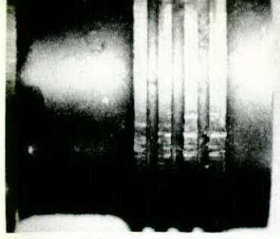
At the crash scene, out of the mud came the bits and pieces; the painstaking reconstruction of the pre-impact details began. The investigators noted, "The massive break-up of the airframe and engine made the technical investigation very difficult...": the aircraft struck at 400+ knots at a dive angle of 45 degrees. The bits and pieces were sent to the Quality Assurance Branch (QAB) laboratory in Hull for microscopic examination, but pending the outcome – if any – the Board had to content itself with "The probable cause of the accident is a malfunction of the yaw damper".

Then came a break. A few weeks later a 104 pilot nearly ejected when his controls and control stick commenced random movements – the same problem which had obliged the other pilot to punch out. Faced with an on-again, off-again control movement, this pilot had to keep in mind that he faced the risk of this recurring on the approach; however, he flew his erratic 104 to a successful landing.

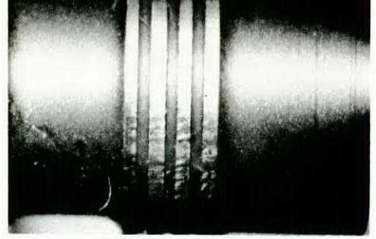
Then came a disquieting discovery. After landing, the hydraulic system was found severely contaminated by metal particles including a lathe turning chip! This contamination of the #1 system led to an hydraulic pump shaft failure while airborne. Too, the #2 hydraulic system was contaminated, and the aileron control cables were found to be approximately one-half the required tension – hardly a comforting state of affairs for the pilots.



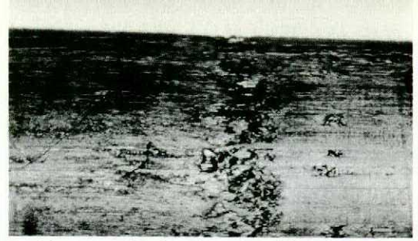
Rudder servo modulating valve spool. This spool, and another similar one for the aileron were damaged.



Gouging damage to rudder spool.



Gouging damage to aileron spool.



Rudder spool shrink assembly showing spool material deposited on the bore and the smearing of the deposited material.

All units were alerted to "...the need for general clean-up of hydraulic handling equipment and aircraft systems", and new stringent procedures were imposed.

Later, investigators got another break. The QAB reported that the aileron and rudder servo modulating valves were severely scored with "...extremely deep and heavy axial gouging on the rear lands... many smaller gouges and scratches over the major portion of these surfaces, and indicates that this damage resulted through several cycles of fouled operation" – enough damage to prove that the "...servo valve spools experienced seizure or severe restriction of movement..." The report continued that the initiating factor in the mechanical breakdown of this valve was *contaminated hydraulic fluid.*

An earlier Flight Comment (Jul/Aug 67) hydraulic contamination article warned of the low contamination tolerance of modern hydraulic systems components. The loss of a valuable aircraft and two pilots lives placed in jeopardy makes the article's opening passage highly relevant:

"At present, strip reports on failed components reveal one glaring common factor – CONTAMINATION. It is therefore obvious that tremedous savings and improved reliability would result if an effective contamination control program were applied. Future thinking must be channeled in this direction.

There are many aspects of a contamination control program; fluid handling, component care, maintenance techniques, system and component design, technical data, maintenance instructions, filtration and flushing procedures. All these areas are vital, but today the profound lack of knowledge on contamination control and its vital importance is our biggest problem."

Does this accident and near-accident indicate that we are doing the wrong things? Perhaps in the past we have been slow to recognize the hazards that a contaminated system can create. Now that more stringent handling requirements are in effect, eg, running all fluid through the 3-micron filtering of the test-stand, it remains to be seen whether we can achieve total success. The CF104 system with its 10-micron filtration may well be inherently capable of generating its own contamination; if this is the case then well-intentioned accusations about poor handling methods may be not only unfair but could obscure the problem.

The finish on hydraulic components is exceedingly smooth and the clearance between two running surfaces is often so small that a bacteria would have to flatten itself out to get by! In this sub-miniature world a particle looks like a jagged boulder. Once these fine surfaces are broken, the metallic by-products from the gouging join in to further erode the surfaces. These components are machined to close tolerances for good reason; the demands for miniaturization with extreme strength and sensitivity make high hydraulic pressures – and with it close tolerances – mandatory. It's a fact of life nowadays and our maintenance organizations will have to live with it. This will mean an increased respect for those one/4-millionths of an ounce.

For T33 drivers

Lost a fuselage tank pump lately? Looks like a better one's been found.

This year's experience indicates that the latest modification of these pumps has done the job. The statistics, one might say, are inconclusive (the numbers recorded are still quite small) but encouraging – we're down to less than ¼ of the 1967 figure.

(cont'd from page 10)

been prepared for:

- a delayed rescue from an unserviceable SARAH
- not being located before dark
- inability of the rescue helicopter to pick up after dark.

Tactical evaluation exercises on recovery of downed crews have shown that signal devices first seen in daylight are: mirror, signal panel, then flares. Flares appear most bright at night but experience proves that unless the searchers are looking directly at the area the flare is seldom seen. Brief burning time and the gun not being held vertically overhead limits the gun's usefulness. (The downed pilot should wait until the aircraft is directly approaching his position or is heard and and judged to be very close.) The flare should be released before the aircraft reaches his position; otherwise the flare may burst behind the aircraft – beyond the searchers' range of view. Helicopter rescue is greatly assisted by flares, but in adverse terrain and darkness, recovery involves severe risk to the helicopter and crew. Therefore, flares should be saved for the following day – that is, be prepared to stay the night.

The first question the downed pilot must ask himself: "What if I'm not rescued for a day or so?" This being a distinct possibility in many areas of Canada and overseas, there should be little doubt in anyone's mind which activity comes first – survival or rescue.

On the Dials

In our travels we are often faced with "Hey you're a UICP, 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. In answering these questions any can of worms opened up in the process can be sorted out for everyone's edification. 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 communications to Commander, Canadian Forces Base Winnipeg, Westwin, Manitoba, Attention: UICP School.

Questions and Answers

In the past few months several questions have been submitted in response to On the Dials articles. We welcome these questions and although we do not profess to know all the answers, we will certainly research the questions and publish the questions and answers as soon as possible.

The Dec 67 issue of GPH 205 indicates the IFF/SIF emergency operation is:

IFF Control Box – EMERGENCY

SIF Control Box – Mode A/3 – switch in, dial code 77. Is it mandatory to perform both functions in order to indicate an emergency?

No. The functions are independent and each function by itself will indicate an emergency under certain conditions.

The best way to explain this answer will be to first outline the ground radar receiving capabilities. There are basically three different types of ground radars that can render aid in an emergency. They are the Department of Transport Airways Surveillance radars, NORAD Air Defence radars, and the military terminal radars. With the DOT airways radar, a mode 3 code 77 selection will trigger an alarm system and display a typical emergency return on the scopes. The EMERGENCY selection will not perform these functions and in all probability it would go undetected. The Air Defence radars will detect any EMERGENCY or 377 selection as an emergency but it has to be processed through the Sector Control Centre who in turn will advise the applicable radar unit. Unfortunately this involves time which may not always be available. DND radars are less sophisticated; they will detect only an EMERGENCY selection if – and only if – the aircraft is transponding on the same mode and code as the radar unit is decoding. They do not monitor mode 3 code 77, so a squawk on this mode and code will not be detected. In summary, a 377 selection will alert both the DOT and the Air Defence radars, and the EMERGENCY selection will alert both the Air Defence and DND radars; however, the latter will detect only the emergency if the aircraft is transponding on the same mode and code as the radar unit is decoding.

Knowing the equipment capabilities you can see that if the pilot is under the control of or is being monitored by, a DND terminal radar unit while transponding on a pre-arranged code, he need only select EMERGENCY on the IFF control box. If he were to select 377 at this time without advising radar he would eliminate both his normal and emergency IFF/SIF presentations from the controller's scope. In all other situations, a selection of mode 3 code 77 in addition to the EMERGENCY selection would give the greatest chance of detection. It should be noted that all radars can be adjusted on request to receive any type of emergency squawk. Therefore, if time permits, an "all stations" call on 121.5 or 243.0 broadcasting your IFF/SIF setting, may well be worth the time.

If my compass system or systems were to fail, will this affect the accuracy of the TACAN and VOR equipment?

Not entirely. Although the TACAN and VOR information readouts are closely associated with the compass presentations, a compass error will not result in a false radial indication. If your RMI compass rose is in error, the VOR or TACAN bearing pointer will still give you the radial you are on and the magnetic bearing to the facility; however, you will not get accurate relative bearing information. For example, let us assume you are on the 180 radial and are flying north, inbound to the facility. Your compass has an error of 90 degrees. The head of the bearing pointer will point to the 360 degree index of the compass rose while the radial will be correctly displayed on its tail. However, due to the 90° compass error, the bearing pointer will be pointing to a wingtip. It is interesting to note that an ADF bearing pointer on the same RMI will function differently. It will continue to give you correct *relative* bearings, but the magnetic bearings will be incorrect. In our example, if the ADF is tuned to a beacon close to the TACAN facility. the ADF bearing pointer will correctly point to the nose of the aircraft but all magnetic bearings obtained by using the RMI compass rose will be 90° in error.

"One hundred above . . ."

The practice of having the first officer advise the captain that he is approaching minimums – or 100 feet above minimums – is becoming an established practice everywhere. The merits of having an additional pilot monitor such an important item during this critical phase of flight cannot be over-emphasized. What is alarming is the evidence that many pilots rely on this reminder call; if it does not come, they are prone to descend below limits. This over-reliance destroys the double check safety principle.

Little imagination is required to realize that a serious hazard could result.

ICPS recommended reading

These articles are recommended because of their newsworthy content:

- article immediately above
- DOT Class II NOTAMS 67/27 and 67/29 concerning VFR special procedures, Toronto area.
- GPH 205 Special Notices, Canada.

For want of a check. . .
pre-T/O, that is

The flight from the beach to the ship was uneventful. The autopilot master switch was turned on but *George* was not engaged. The deck landing was routine; you know – O/S G, RIG, HAR,* WOW! After rollout the copilot set the flaps to takeoff position and reset the trims.

There was a lot of mail to be off-loaded. Then our passengers arrived and shoved aboard. There was very little control shown, so the copilot got out of his seat, after folding the console, and moved aft in the aircraft to restore order and check mae wests, hardhats and harnesses. He had extreme difficulty with the passenger by the door; we had to have outside help to sort this chap out.

Finally everyone was ready, and the copilot in his bulky poopy-suit lumbered back into the front office and strapped in. I lowered the folding console, had a quick lookaround, and nodded to the copilot who indicated to the flight deck officer that we were ready. We were wound up, then waved to take off – power normal and away we went.

Came time to rotate and the column was extremely stiff; I really had to haul to get the nose up. It wasn't up very far when we ran out of deck but we didn't appear to lose altitude. I was still hauling to bring the nose up, when suddenly the stick pressure reversed. I was then pushing to try to stop the nose coming higher. The nose came up quite a ways before I could get the column forward and the nose coming down. At this time the copilot said something like "What are you doing?", Control said something like "What are you doing?", and I said to myself something like "What am I doing?". Flyco gave us a blast about rotating sooner next time.

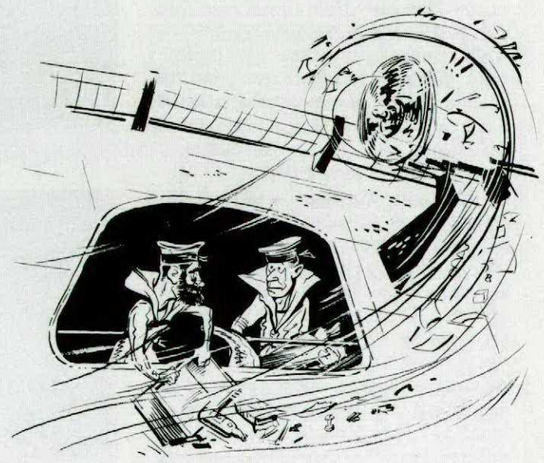
I had realized that the reason for the semi-frozen controls must be the autopilot and had punched it off, about the time that the nose came up to a normal attitude. I definitely felt the controls unfreeze. The copilot raised the gear. I had turned off the autopilot with the master switch, although I could have used the button on the column.

I feel that if we hadn't been in such a rush (the passengers did give us a hard time and were very slow to get organized!) and if the copilot hadn't had to leave his seat, then maybe we might not have inadvertently got the autopilot engaged.

In any case, a proper pre-T/O check would have caught the culprit and saved a lot of sweat. A full pre-T/O check is not normally done on a stop-and-go but you can bet that this mouse will do one from now on.

P.S. The autopilot engaging button (Mark I Tracker) was found to be up above its guard, and could be engaged very easily by placing a clipboard on this console, for example. It has now been lowered inside the guard.

*Over-Shot Groove, Right In Groove, High At Ramp



So I says to the FSO, "Why put a FOD poster in the galley – of all places!"

Gen from Two-Ten

ALBATROSS, UNAUTHORIZED REPAIR On a search mission the pilot applied climb power which was followed immediately by a starboard fire-warning light. No smoke was visible although the carb heat increased 20 degrees. The pilot reduced power and the light went out although occasional puffs of black smoke were seen coming from the top of the engine. The pilot waited five minutes then re-applied cruise power despite the earlier indication that the engine had possibly malfunctioned.

Two screws holding the exhaust connector to a cylinder head had sheared allowing the complete assembly to fall away from the cylinder. Closer inspection showed that this component which is normally shrunk fit to give a very tight connection had not been properly installed in a previous field rectification. In fact, the work was done contrary to EOs.

Without the shrink fit, the screws couldn't carry the load – demonstrating the need to *follow EOs to the letter.*

TUTOR, BLOWN CANOPY During his pre-start, at the item "Parking brake ON", the solo student pulled the handle. The canopy jettisoned perfectly; fortunately, no-one was nearby. He couldn't explain why he pulled the wrong handle.

Possibly the cost of repairs will be offset by the value of the lesson on the results of inattention. Ironically, the student admitted to being "...pleased to be getting airborne". Before pulling that handle, flicking that switch, pushing that button... THINK – about what you're doing.

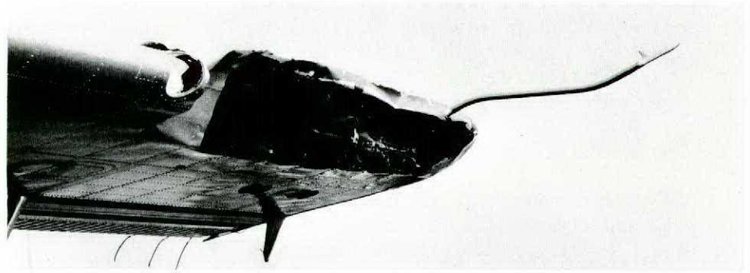
OTTER, WHEELS DOWN ON WATER An amphibious Otter, climbing after takeoff from land was over a lake when the first officer abruptly closed the throttle for a simulated forced landing. The captain carried out the engine failure check and made a descending turn to set himself up for a water landing. But on touchdown a progressive digging-in of the port float finally caused the port wingtip to submerge. When water came up over the windscreen, the captain ordered everyone to abandon ship; however, the aircraft came to rest in a normal attitude on the floats.

The wheels were DOWN.

The unit procedure was to delay retraction of the wheels after takeoff until an altitude was reached which would permit extension of the slow-acting gear in the event of an engine failure. The captain had forgotten to complete the delayed post-takeoff check; also, he neglected to carry out a pre-landing check while concentrating on the simulated forced landing. The first officer did not ensure that a pre water-landing check was done.

Unit policy was to use a checklist for pre-takeoff or vital actions only; in-flight checks were supposed to be verbal from memory and checked by the first officer.

Injury or loss of life easily have occurred had the aircraft overturned – as has happened before – despite the wearing of mae wests. One of the passengers could not swim.



ARGUS, BLOWN TIRES Landing away from base in crosswind conditions very close to limits an Argus pilot with little experience on type inadvertently applied brake as a result of his using full rudder.

(This incident occurred at the end of 24 hours of duty in the previous two days.)

OTTER, SCRAPED FLOATS ON LANDING The student pilot at the controls (with an instructor in the co-pilot's position) had done several circuits and landings without incident, then landed the aircraft, scraping the floats. The gear had either collapsed or had only partially cycled. It was not determined positively how this had occurred; it was mentioned that the Otter has a history of interrupted gear cycling.

Firmly established, however, was that both pilots had failed to ensure the undercarriage being down as prescribed in the pre-landing check and final landing check in the AOIs.

This occurrence re-introduced the age-old discussion about undercarriage devices. The amphibian, of course, does not lend itself well to a warning for gear position, down or up – either position could be dangerous. The Otter's undercarriage indicating system is less than satisfactory; this contributed to the incident. Pending a breakthrough in pilot warning devices looks like the old checklist is still our best bet.

TRACKER, WINGTIP STRUCK GROUND On a touch-and-go of his second flight in the aircraft, the student pilot flew at too low a final approach speed. Just before touching down a wing dropped; the student checked forward before the instructor could take control and recover. The wingtip and wheels contacted the runway and the aircraft became airborne. On overshooting, the instructor flew a circuit despite a jammed left aileron.

Later, the de-icer boots were found ON; this increases stalling speed 5 to 7 knots. The instructor could not remember turning them off after the functional check on the ground.

The AOIs are being amended to include this item in both pre-takeoff and pre-landing checks. Nevertheless, this amendation should not obscure the fact that *a complete and careful tarmac check precedes every safe flight.*

Comments to the editor

Your Safety Comment item "I have control" in the Jan/Feb issue, page 22, suggests we find another word for "control" when handing over control of aircraft electronic equipment, and goes still further to suggest that switches labelled "control" might be changed to "command" and that the word command replace the word control when referring to electronic equipment.

I feel this would compound the problem by having two similar sounding words having the same meaning; ie, to denote transferring control or command of the aircraft or electronic equipment. This would surely lead to confusion when sooner or later someone would substitute one word for the other.

The simple and obvious answer to the problem is to stay with the terms "You have control" and "I have control" to signify transferring aircraft control (CFP 100, article 8.01). When it is necessary to transfer control of electronic equipment one merely names the appropriate equipment while still using the tried-and-true phraseology, eg, "You have control of the UHF" and "I have control of the UHF". In fact this is precisely the phraseology used by many of the pilots that I have flown with.

Capt R.F. Patching
Central Flying and Navigation School

We nearly lost an aircraft last year (see Flight Comment May/Jun 67, p 26): "While cruising at 5000 to 6000 feet MSL approximately 20 miles from the aerodrome I asked 'Is it OK if I take control of the TACAN? I want to check the local TACAN channel'. Part of this must have been blocked out by a transmission on tower frequency and the other pilot heard 'Is it OK if I take control?' and he released the control column saying 'You have control'. I said 'OK, I've got it' as I switched the TACAN control to the rear cockpit. . ."

In this case only the word "control" was heard and having it irrevocably linked in a person's mind as referring to aircraft, created this near disaster. At least, the word command would have helped in this situation.

CFP 100 doesn't specify handover phraseology for other equipment. The consensus hereabouts is that a simple "I have the TACAN", and "You have the TACAN" is preferable.

Looks like CFP 100 should be more specific.

In the Jan/Feb Flight Comment, page 7, both technicians are wearing rings and one man appears to have a flexible metal watchband.

I realize that these are posed pictures and that the individuals were probably not actually working as shown but it is nevertheless a poor example in a magazine devoted to discouraging this type of thing.

How about a full-page spread of that torn-off finger you have in your files to make up for this lapse and remove any doubt about where your magazine stands on this matter?

Sgt C.H. Stokes
CFB Cold Lake

There's another metal watchband on page 8!

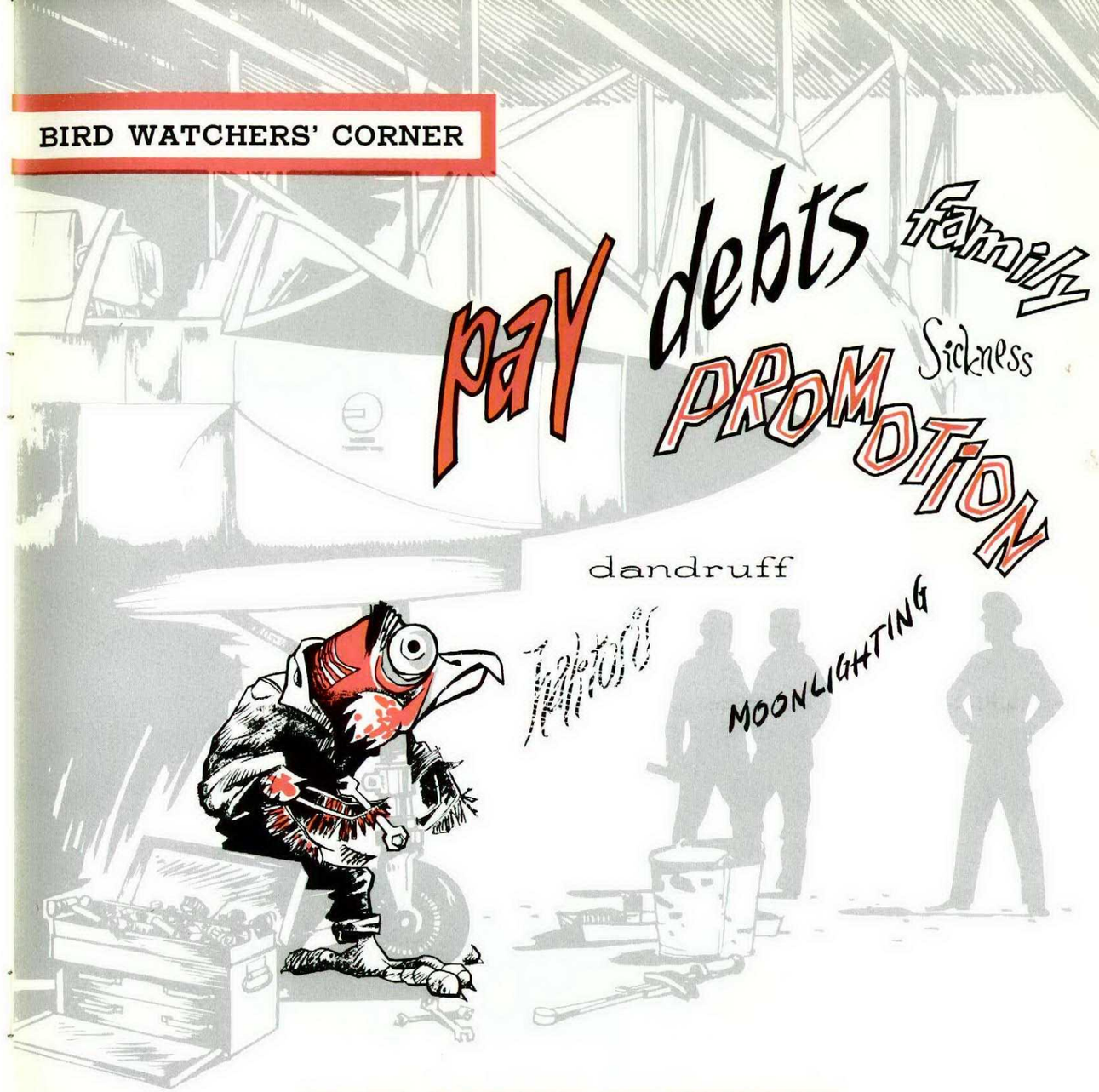
Because the rotor of his H13 was free-wheeling in the wind a pilot actually grabbed the stabilizer bar each time it came around. His ring engaged the mechanism and, as an engineer might say, the break strength of the ring exceeded the tensile strength of the digit. For a close-up of the grim evidence, see EO 00-80-4.

Which way the "wind"?

In this instance, the wrong way for a co-pilot. He was smoking in the cockpit and flicked his cigarette ash into the ashtray. But a nearby air vent was directed toward his face, the hot ash got into its air stream, and was blown into his eye, burning the eyeball and sending him to the hospital.

– Flight Safety Foundation

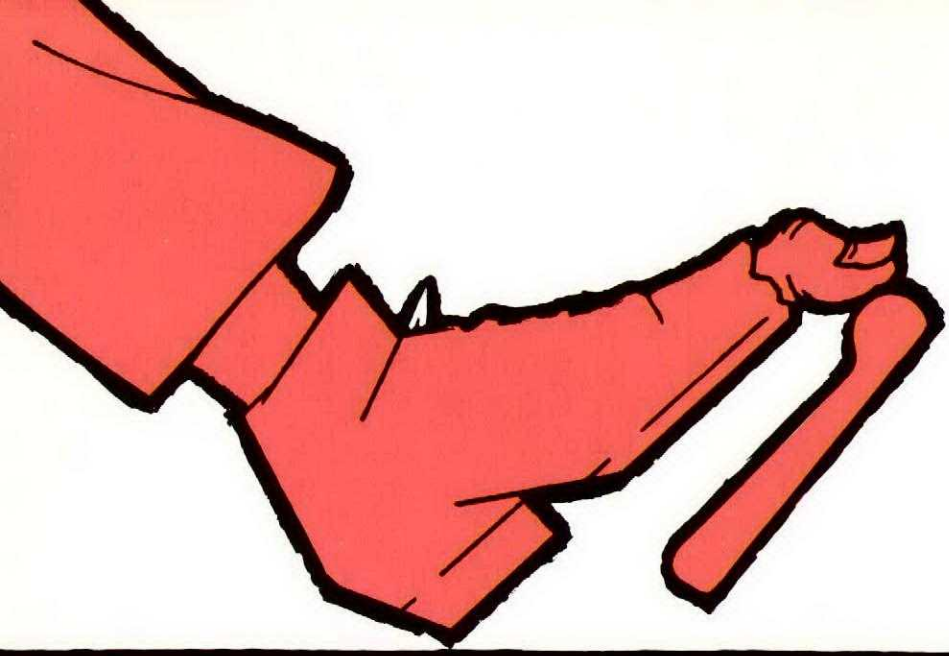
BIRD WATCHERS' CORNER



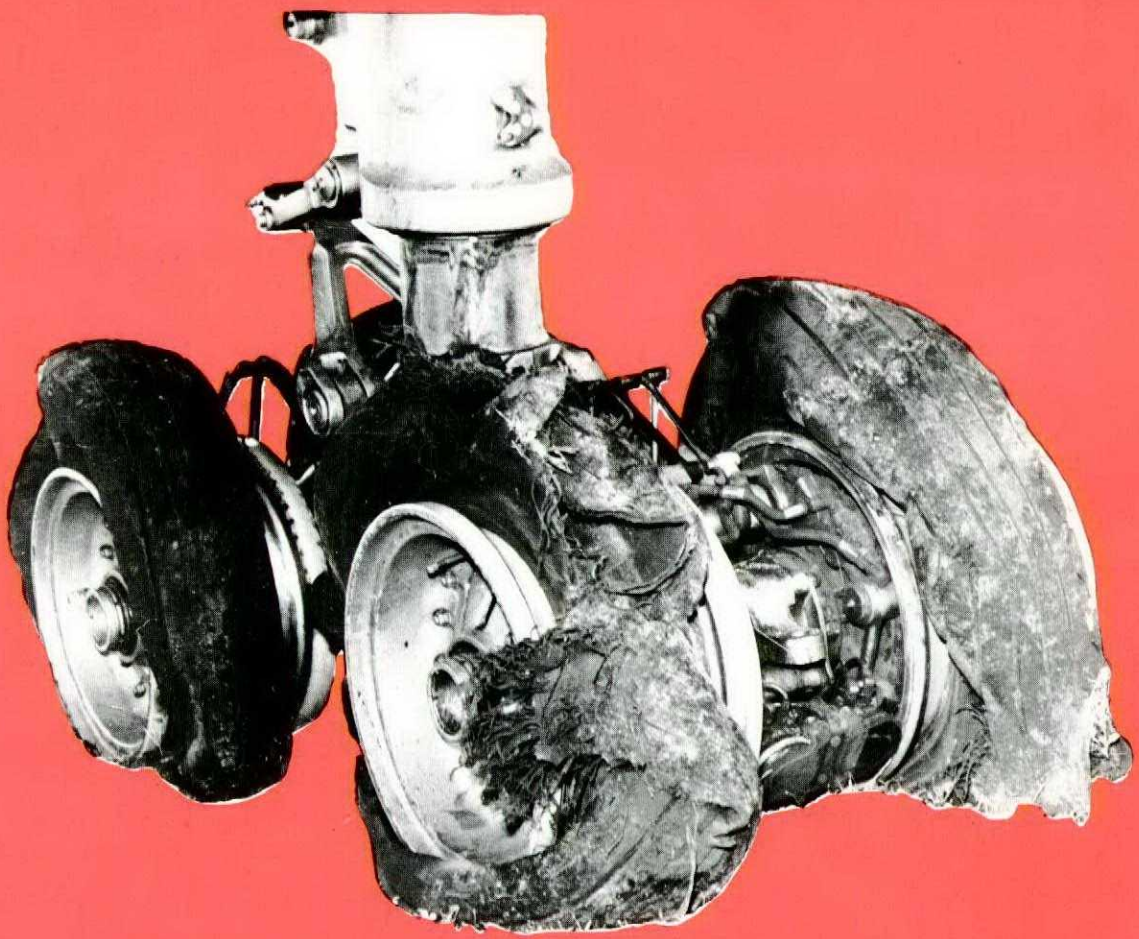
FAR-AWAY FLUSTER

Appearances deceive and this bird's appearance is deceptive indeed. Even the experienced bird watcher might not suspect that beneath those unruffled feathery features is an agitated mind that is best described as - elsewhere. Circumstance compels this bird to attempt the impossible: to achieve a physical presence and a mental absence. In this state he falls ready prey to error-borne hazards. Oblivious and alone among his flock he whistles - more in hope than conviction - a self-deluding ditty entitled:

NONEEDTOFRET IHAVEN'TGOOFEDYET



Little toe...



...BIG BLOW!