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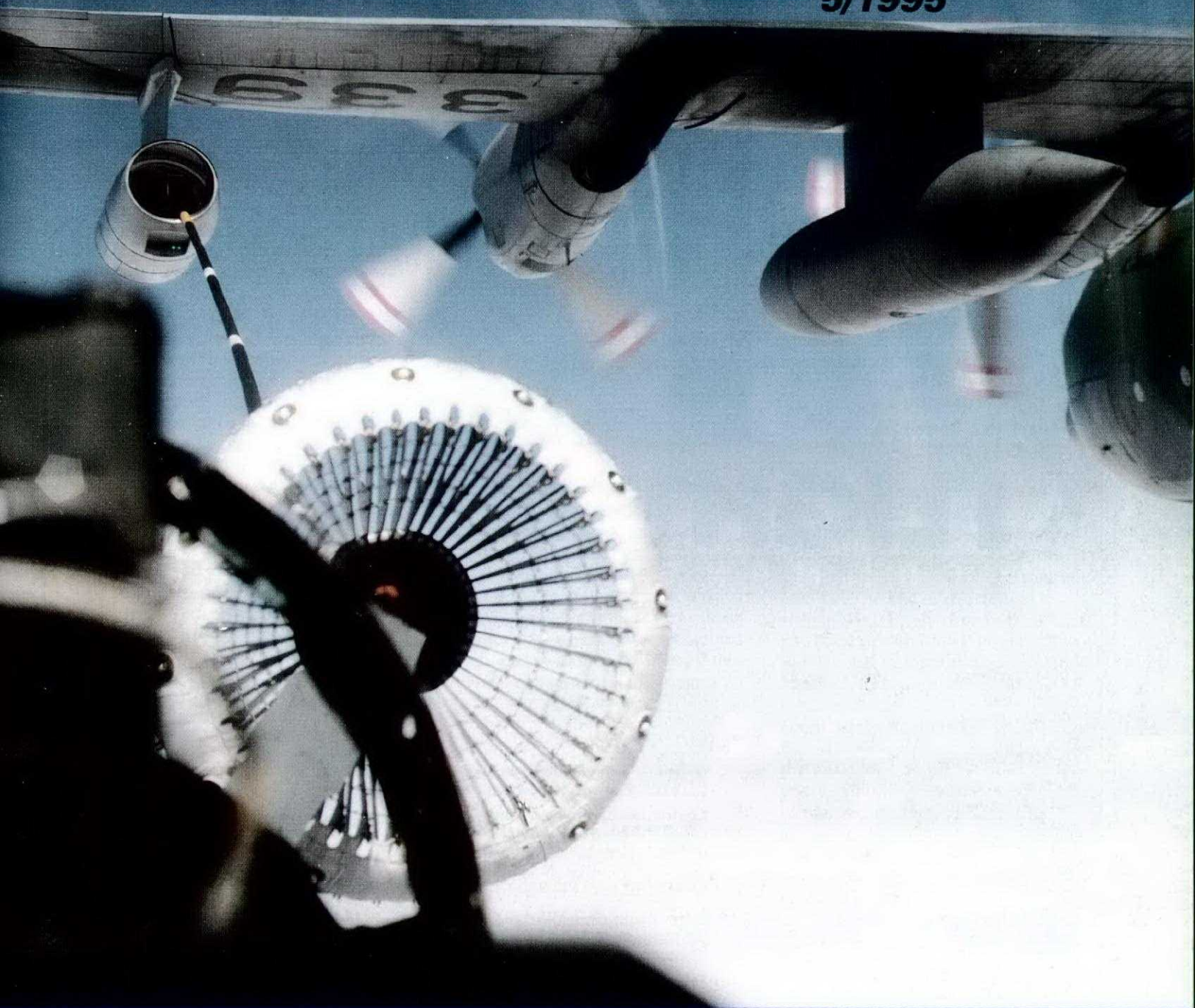
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# FLIGHT

## COMMENT

5/1995



Canada



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## FLIGHT COMMENT

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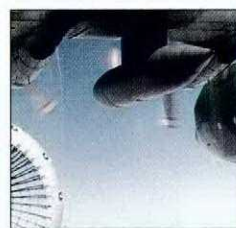


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# AS I SEE IT

by BGen J.R.B. Proulx, Commander Air Transport Group

The phrase 'flight safety' conjures up many prevalent themes in our modern airforce including professionalism, risk management, and communication. Previous commanders who have occupied this editorial position have touched on these topics and I would like to follow this precedent by relating my thoughts on what I feel is an essential element in the philosophy of flight safety for Air Transport Group (ATG). This element is **leadership**.

Flight safety is a team concept and the ATG team can only function through the guidance of strong leadership. I speak of this requirement for leadership at all levels and all crew positions. Leadership must be exercised by our aircraft commanders and this guidance must present an ethical and professional example to all members. The leadership skills of our senior NCMs play an essential role in an effective crew environment as they represent the "knowledgeable experts" within the flight engineer, loadmaster and flight steward occupations. This need for leadership extends beyond the individual aircrew and must also be reaffirmed in maintenance, Air Traffic Control and other support organizations. The importance of leadership, in all areas, cannot be overstated in maintaining a safe,



our training mandate we have emphasized the concept of crew coordination training, and I am extremely proud of the developments that have occurred in this area under ATG. A programme has been in place at our Operational Training Unit at 426 (T) Squadron and has expanded to include training for aircrew involved on all ATG aircraft. Recurrency training is being developed and it is hoped that our training curriculum will closely resemble the crew resource management programme that is evolving within Air Command. Training is a prominent part of our operations and we must always impart as much knowledge and experience as we can to our newer aircrew. Our goal of actively participating in the training process can only enhance our professionalism and ensure flight safety goals are achieved.

The development of a safe, effective airforce for the next century will be an overwhelming challenge in what has become a difficult era for the military profession. The harsh realities of fiscal constraint, aging fleets and reduced manpower will create an even greater need to scrutinize our daily operations and ensure that the overall focus is squarely on flight safety. The challenges that lay ahead should not soften the enthusiastic spirit of our airforce personnel. I believe the key to re-building a streamlined, safety conscious airforce is leadership!

The future operations of ATG will continue to expose our personnel to globally diverse and remote locations. Flight safety is an integral element of the ATG philosophy and I again stress the need for safe responsible leadership at all levels of supervision. Leadership and training must be actively pursued by all operational and support commanders. Their cumulative efforts for Flight Safety cannot be overlooked.

ATG is looking forward to a productive and safe future in a rapidly changing airforce. ♦

**Leadership  
must be exercised  
by our aircraft  
commanders**

professional approach in achieving our operational goals.

The problems that oppose ATG in fostering this leadership are not

unlike the obstacles facing other organizations. Recent reduction plans have depleted ranks and our experience levels have dropped dramatically, especially within the flight engineer MOC and the technical occupations. The next few years will be a transition period for ATG as many young leaders will assume positions of responsibility that were previously filled by older, more experienced personnel. This lack of experience should not be viewed as detrimental but instead should be taken as a challenge to develop a streamlined and more efficient air force.

Because of these diminishing experience levels, the need for training becomes increasingly important. Every flight in ATG is essentially a training flight and all personnel must strive to ensure the continual training of their subordinates. To supplement



# ACCIDENT RESUME

Type: CF188928  
Date: 22 August 1995  
Location: 4 Wing, Cold Lake

## Circumstances

The mishap aircraft, a two-seat CF18 with an instructor pilot in the rear cockpit and a student pilot in the front, had returned from a routine training mission and was conducting a landing on Rwy 22. The approach was normal; however, shortly after touchdown the pilots felt the right wing of the aircraft begin to settle and were alerted to a problem by the sounding of the landing gear warning tone. In addition, the warning light in the landing gear selector lever illuminated while the right main landing gear light extinguished, giving the aircrew a definite indication of an unsafe main landing gear.

As the front seat pilot applied aileron in an attempt to prevent the



Front view of the aircraft.

shut down the engines and conducted an emergency ground egress. The pilots escaped from this mishap uninjured, and the aircraft sustained "C" category damage.

The initial investigation into this accident identified a failure of the "jury link connecting lugs" to the main landing gear side brace assembly, as well as a badly bent connecting link from the planing link assembly.

Prior to this mishap, the maintenance community was aware of a potential problem concerning the CF18 main landing gear side brace assembly and were already in the process of taking action to address this issue. It is unfortunate that preventive measures could not have been enacted sooner so as to avert this costly accident. ♦



Left rear view of RH main landing gear wheel.

right wing from striking the runway while at high speed, the rear seat pilot advised air traffic control of the emergency situation. Directional control was maintained for approx 4500 ft, whereupon the right wheel rim began to dig into the runway surface causing the aircraft to violently rotate through approx 270° of turn. Shortly thereafter the aircraft came to a stop, still on the runway, and the aircrew

## DFS Comments

The pilots involved in this accident must be commended for the calm, rational manner with which they reacted to this unexpected emergency situation. The excellent crew coordination which they displayed was undoubtedly a key factor in the aircraft remaining on the paved runway surface.



Recovery of CF188928.

# IMPROVE EFFICIENCY BY CONDUCTING A POSTFLIGHT?

by Lt(USN) D.C. Irwin

One noticeable way in which daily flight operations are conducted differently between the U.S. Navy and the Canadian Forces is the aircraft postflight. In the CF, aircrew do not seem to conduct one. As I began my check-out in the CF fighter community, the old habit of postflight inspecting the aircraft would not die. I noticed I was alone in this practice.

It did not take me long to rationalize why the U.S. Navy had instructed me to always postflight my aircraft. It proved to be a time saver for turn around maintenance actions. There are certain missions where the aircraft is more likely to receive physical damage. So I assumed that CF aircrew surely must do a postflight after such a mission when damage is possible.

The following examples disproved my assumption.

A CF18 had conducted night air-to-air refuelling. The pilot would have been aware of a basket slap against the aircraft, but the possibility of damage went unreported to maintenance and unnoticed during following checks. The following night a cut was discovered in a lower communications antenna. The antenna was replaced

but the cause and possibility of further damage was not investigated. Four days after the refuelling incident, a tech noted broken and missing louvers on a door and cracks on a pitot tube and another antenna. The full extent of initial was finally discovered and repaired, but not before the aircraft had flown SEVEN missions after the original occurrence.

A second example for why post flight should be conducted comes from the swing wing world of aviation. On a Twin Huey, dents and scrapes were discovered on the outer two feet of the main rotor blades. The main damage was two dents, each approximately 3 inches long, 1 inch wide and 1/8 of an inch deep. Maintenance later determined the dents were within acceptable limits, documented the damage and returned the helo to service.

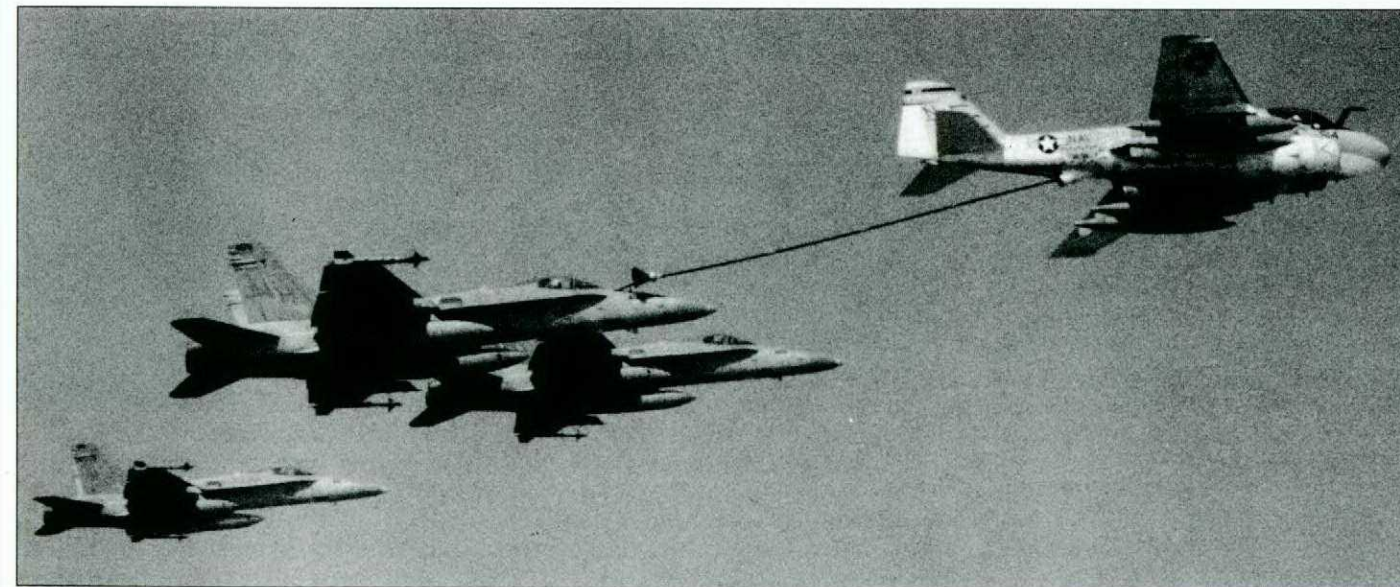
This particular helicopter was recently transferred from another unit. Best estimates were that a confined area night landing had been conducted six days earlier which resulted in a tree strike. This tree strike was not suspected during the flight nor was it discovered during

"A" checks after landing.

So why should you do a postflight inspection? Only during a few bitter windy days of winter might a direct route from the boarding ladder to the hangar door be justified. When a proper aircrew postflight is conducted, damage that is a result of the mission will most likely be detected in the most expeditious manner. No matter what aircraft type you are flying, you should be able to identify missions where damage or increased wear and tear are likely to occur. As aircrew, you know if you had a basket slap on the tanker, a tree a little too close during confined area landings, or a few birds pass by during final.

Help your maintenance personnel by identifying things that didn't seem quite right or don't look the same since you left the ramp. You will start the corrective maintenance sooner and also have a few more minutes to converse with the hard charging individuals who made your flight possible.

Lt(USN) Irwin retired from the USN Jul 95 after having completed his last billet as the CF18 desk officer at DFS. ♦



USN F18s topping up with a KA-6.



# FOR PROFESSIONALISM



(from left to right)  
CAPTAIN DARREN MCGUIRE  
MASTER WARRANT OFFICER  
MIKE JOYAL  
CAPTAIN JOHN DAVIES  
MAJOR MIKE MUZZERALL  
LIEUTENANT PAUL HOLLAND (absent)

Capt McGuire and his crew were conducting an over-water training mission eighteen miles south of Shearwater. While transiting between dips, the Nav, Maj Muzzerall, noticed fluid dripping above his seat. The AESOP, MWO Joyal, and a second Nav, Capt Davies, determined the fluid to be fuel and set about removing the aircraft soundproofing to determine the source. Capt McGuire turned the aircraft toward Shearwater and declared an emergency.

MWO Joyal reported the drip had become a steady stream, leaking through a vent from the number one engine compartment. Realizing the potential for an engine compartment or cabin fire, Capt McGuire directed the student pilot Lt Holland to secure the number one engine. Soon after he secured the engine and fuel panel, the leak abated and eventually stopped. Still wary of the potential for fire, Capt McGuire directed the crew to prepare for ditching while setting up for a single engine approach.

Capt McGuire and his crew demonstrated outstanding performance under pressure. Their immediate action, solid professionalism, and good judgement averted the potential for more serious complications and resulted in a smooth expeditious recovery. ♦



CORPORAL JIM ORANGE

While performing a daily inspection on a Tutor, Cpl Orange discovered a partially disconnected personal lead block on the ejection seat.

Though the called for visual inspection gave the impression of a normal connection, Cpl Orange's attention to detail led him to discover that the personal block had deteriorated, allowing the lanyard assembly to rotate and snag on the rear of the ejection seat. Seat movement, through adjustments and vibration, caused tension on the lanyard assembly which in turn led to the releasing of the lanyard assembly clips and partial disconnect of the block.

Had this condition gone undetected, the ejection seat would have disabled, preventing an emergency escape from the aircraft. Cpl Orange's professionalism and thoroughness may well averted a loss of life. ♦



MASTER CORPORAL DARRYL BOYLING

While conducting an on board check of a deployed Aurora, MCpl Boyling, an AESOP, discovered an electrical bundle clamp in the port flap well. As a result of this discovery, the aircraft start was delayed and a thorough FOD check carried out with no other FOD found.

The flap well is not normally inspected during the AESOPs on board check. Had this clamp gone undetected, there was a high possibility of a very serious airborne incident. MCpl Boyling's diligence and professionalism in carrying out an in-depth check is commendable. ♦



CAPTAIN  
JON CLOW



CAPTAIN  
CHUCK HALIKAS

While conducting an Air Defence Exercise, Schooner Blue Two experienced a significant power loss. The T33 was immediately zoomed and emergency engine failure procedures were accomplished by Capt Clow in the front seat. Meanwhile, Capt Halikas declared a MAYDAY, and broke out the checklist for further action.

The aircraft was stabilized at 53%, 1800 ft, 11 miles south east of Shearwater. Cpts Clow and Halikas were able to establish that the aircraft could make a straight in partial power landing by holding a glide of 145 kts. This profile placed the crew on the very edge of the aircraft's capability. The crew also established decision gates throughout the recovery to assess progress, and ensure that they could safely abandon the aircraft at any time.

The landing was uneventful. The outstanding professionalism and calm reaction of the crew to this critical emergency precluded what could have easily been a disastrous scenario. ♦

# FOR PROFESSIONALISM



SERGEANT MIKE BOILEAU

Sgt Boileau, a Communication and Radar Systems Tech, was tasked to carry out a quality assurance inspection on a Sea King. While inspecting the electronics bay, Sgt Boileau discovered a control rod eye end which was extended past the safety position. He alerted the Airframe Techs who confirmed the control fault and rectified the unserviceability.

The area in which the fault was discovered is extremely cramped and poorly lit. As well, the control rods are mounted at the top of the compartment, making it even more difficult to detect the abnormal condition. Had this discrepancy gone undetected, the control rod eye could have separated from the control rod, resulting in a complete flight control failure.

Sgt Boileau is commended for his motivation and thoroughness leading to discovery of a serious fault not associated with his trade. ♦



MASTER CORPORAL GAETAN AUDET

During a night launch of a Sea King from HMCS SKEENA, MCpl Audet, having completed his immediate duties on the flight deck, chose to observe the launch sequence through the hangar door port holes. Despite

the low light conditions, he spotted a clear fluid flowing onto the ship's "Bear Trap". Suspecting a major fuel leak, MCpl Audet immediately notified the Landing Safety Officer. MCpl Audet's suspicions were confirmed and the launch was terminated without further incident.

Post flight investigation revealed that a high pressure fuel line had chafed and burst in the number two engine compartment. There was a high probability that the large quantity of fuel spraying into the hot engine compartment would have ignited once full power was demanded for take off. MCpl Audet's attentiveness and swift actions prevented a potentially catastrophic accident. ♦



MASTER CORPORAL  
DON JARRETT



SERGEANT  
FRANK WALSH

CORPORAL SHAWN MCGREGOR  
(photo not available)

MCpl Jarrett and Cpl McGregor were tasked with changing the tail rotor assembly on a Twin Huey. While turning the tail rotor, an unusual faint noise was heard coming from another part of the helicopter. Working together, they were able to narrow the sound to the hangar assemblies of the tail rotor drive shaft. Inspection of the witness marks on the mounting bolts showed that they and the rest of the tail rotor system were serviceable.

MCpl Jarrett and Cpl McGregor informed their supervisor, Sgt Walsh, who then verified the noise, and despite the presence of witness marks, knew that something was not correct. Sgt Walsh instructed the two techni-

cians to verify the torque of the hangar assemblies and discovered two of the mounting bolts were improperly torqued. This discrepancy allowed minute movement and was the source of the noise.

Sgt Walsh, MCpl Jarrett and Cpl McGregor demonstrated outstanding professionalism and skill in discovering a serious problem. Their inherent concern for flight safety and perseverance prevented a possible tail rotor system failure. ♦



WO2  
SHANNON PRIEST



LIEUTENANT  
PETER BEATTY

Lt Beatty, Glider Launch Control Officer, and WO2 Priest, Staff Pilot, both from the Prince Albert Gliding Centre, noted something unusual about the appearance of an aircraft on final for the runway. The aircraft, a Lake Amphibian, was approaching to land with its landing gear retracted.

After verifying between them that indeed, the aircraft was about to land gear-up, Lt Beatty quickly ran over to the radio and transmitted, "Overshoot, Overshoot! Your landing gear is not down". The pilot of the Lake reacted and commenced an overshoot, bottoming out at five feet above the runway. The aircraft completed a normal circuit with no further incidents.

Lt Beatty and WO2 Priest are commended for their keen awareness and quick evaluation of this potentially hazardous situation. Because of their quick response, an aircraft accident was prevented. ♦



# SOMETHING NEW IN +G TOLERANCE: PUSH-PULL EFFECT

by LCol Bob Banks, MD, DCIEM

**C**F pilots know about G, generally. Pull the stick back and houses get smaller, positive G (+G) increases, blood goes to the feet, vision turns grey (greyout), or "tunnels", or even turns black (blackout). If it continues long enough, G-induced loss of consciousness (G-LOC) occurs and you "rubber-chicken". Do the anti-g strain. On the other hand, push the stick forward and houses get bigger, negative G (-G) increases, blood goes to head, eyes bug-out. *Don't do the strain.*

Is that about it? Perhaps, until recently. But research has identified something new: the "push-pull effect". Consider this true incident:

The instructor took control at 19,000 ft to set the student up for the next manoeuvre. He applied burners, pulled the nose up, then pushed forward into a zero G max acceleration climb. Maintaining the zero G, with full burner, he rolled inverted, then started to pull the nose down to max G available: about +2 to +3 G. The aircraft continued to accelerate through 500 KIA and broke the 14,000 ft floor of the training area before the student questioned the instructor's actions. There was no response from the back seat. Taking control at 12,000 ft, the student completed an aggressive recovery. The instructor's voice came up on the IP several seconds later.

Pilot incapacitation due to G-LOC? The student thought so. What the instructor thought was not recorded, although amnesia for G-LOC is common, and possibly he was not aware. But . . . G-LOC at +2 to +3G??

For several years, a few flight surgeons wondered about something that many pilots knew: *initial, or starting G level affects +G tolerance.*

Starting from zero G, or -G instead of +1G seemed to decrease G tolerance. Although not taught in aeromedical training, many pilots learned to cope. Snowbird solo pilots reported that they sometimes hesitated after -G flight to "let the body catch-up" before pulling hard +G. Top U.S. competitive aerobatic pilots reported that they trimmed the aircraft to keep flying while they G-LOC'd during +G loops that followed -G, clearly not a desirable flying situation. These clues to a problem led to research.

The initial study was conducted at Moose Jaw. Pilots were 'wired-for-sound-' and exposed to flight conditions that included -G. When the data was analyzed, it was found that the heart slowed down dramatically during -G (within 2 seconds), and was comparatively slow to recover during +G that followed (6-8 seconds). This time difference was thought to be the cause of lowered +G tolerance when +G followed -G.

Additional research at the US Navy lab in Pensacola, Florida showed that G-tolerance was significantly reduced by preceding zero or -G, and that this reduced tolerance was worse with more -G, and more time exposed to the -G. How much tolerance was lost? The average amount of +G tolerance loss among the 12 volunteers was 1.3 G in the worst conditions (i.e. going from -2 to +2.25 G). However some individuals did far worse. When going from -1 G to +2.25, one subject lost nearly 4 G of tolerance, experienced total loss of vision, and was very close to G-LOC. In one experiment 50% of 12 volunteers greyed-out at +2.25 G after -2 G.

The results were clear and confirmed that +G tolerance depends on starting G, and is lowered if you start from zero or -G. Since -G is commonly

achieved in many aircraft by pushing forward on the stick, and +G by pulling back on the stick, this loss of +G tolerance was called the "push-pull effect". (1)

Further work has shown that women seemed to tolerate push-pull effect better than men. This was found to be due to differences in height and it seems that tall people are more susceptible to push-pull effect than short people. The anti-g strain was found to be effective in countering push-pull effect, but **the strain had to be started early and maintained for the entire period the pilot was under increased +G.**

Has push-pull effect caused aircraft accidents? Almost certainly, although direct evidence is difficult to obtain. US civil aviation, through the investigative functions of the FAA has implicated push-pull type manoeuvres as causal to some accidents. Until recently, push-pull effect was not implicated as causal to any military accidents, although several fighter accidents seem to have involved push-pull type manoeuvres, including some CF18s. There is speculation that push-pull effect may be a hazard in high speed, nap-of-the-earth attack aircraft, both fixed and rotary wing. Many mishaps in this mission environment remain unexplained.

In summary, a new problem has been identified regarding +G tolerance: the 'push-pull' effect. Thus, pilots should consider *starting +G, in addition to magnitude of +G, rate of onset, and time of exposure*, when considering their ability to tolerate +G. In addition:

1. push-pull effect is worse with more -G;

2. push-pull effect is worse with longer duration of exposure to -G;

3. the anti-g strain manoeuvre is at least partly successful in countering push-pull effect, but relaxation during +G may allow push-pull effect to return; and

4. tall people may be more susceptible to push-pull effect.

## REFERENCE

1. Banks RD, Grisset JD, Turnispeed GT, Saunders PL, Rupert AH. The "Push-Pull Effect". *Aviat. Space Environ. Med.* 1994; 65:699-704.

*About the Author*  
LCol Bob Banks, MD. Pilot-flight surgeon, currently Head, Aerospace Life Support Sector, Defence and Civil Institute of Environmental Medicine (DCIEM). ♦



CF18 in a high angle of attack.

## SAFETY EQUATION

**E**very supervisor realizes there is no surefire method for a shop to obtain an accident-free record. Mainly, because we are dealing with employees as human beings; each one possessing a different attitude. We can make our shops and machines safe as humanely possible; but if the employees do not possess the proper attitude, then our accident rate is bound to soar.

Just what is employee attitude? It is what's in the employee's mind when he is performing the job. The success with which he translates these thoughts that are in his mind into actions will determine our accident rate.

This adds up to one equation: A safe environment + a safe worker = a safe shop.

*Although this article appeared in Flight Comment Mar/Apr 1960 its message is valid for today's military environment. Downsizing, FRP, contract renewals are on the minds of our 'employees' and their distraction could lead to an aircraft or ground accident. Supervisors and peers must maintain a vigilance for external pressures and help your co-workers operate in a safe environment. ed ♦*

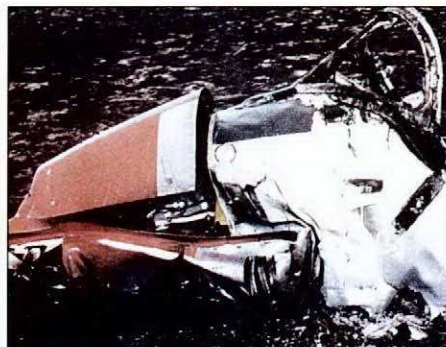


# EPILOGUE

## Aircraft Accident Summary CT114073

On 14 August 1992 Tutor CT114073 experienced a compressor stall forcing the two pilots to eject, destroying the aircraft and seriously injuring the instructor. The investigation into the accident has been completed.

CT114073 was conducting a practice flapless approach on a local training mission when it developed a mild vibration. On crosswind leg, the power was reduced at which time there was a loud bang and a loss of thrust. The engine could not be relit and the aircraft was not in a position for a safe forced landing; thus, both pilots made a controlled ejection at approximately 600 to 800 ft AGL. The instructor's main parachute did not fully deploy due to an entanglement of his chute with his seat and he received serious back injuries upon landing.



Forward fuselage.  
Note: Position of access panels and step.

Detailed technical investigation by the Quality Engineering and Test Establishment (QETE) determined that the engine's Number 2 bearing had failed leading to a catastrophic engine failure. Though the cause of the bearing cage failure cannot be absolutely proven, there is now evidence that small spherical plastic bead used for cleaning may have contaminated the bearing and caused its deterioration.

A disturbing aspect of this accident was the failure of the ejection system to ensure a clean separation of occupant and seat.

Seat/occupant/parachute interference which has occurred in this accident was a result of the seat's inherent instability. Aircrew that deviate significantly from the ideal weight of 165 lbs. could be subjected to a highly unstable ejection (tumbling). If the seat ends up behind the occupant after separation, it may come in contact with the occupant/parachute as the parachute deploys and decelerates. The operating characteristics that led to this interference are well known; unfortunately there is no simple or cheap solution and DFS continues to search for a viable option. Notwithstanding, there can be no doubt that the Tutor ejection has proven itself to be a reliable means of escape over the years and has saved the lives of 48 aircrew. ♦

# EPILOGUE

## Aircraft Accident Summary CT114079

On 21 March 1994 Tutor CT114079 experienced a compressor stall which forced the two pilots to eject, and destroyed the aircraft. The investigation into the accident has been completed.

During a practice of the Snowbird's "High Show" routine the pilot heard an unfamiliar noise and felt a loss of thrust. The pilot zoomed the aircraft up to 2,500 ft AGL and 130 kts. During relight attempts the RPM only increased to 47% (55% is idle). Finally, the throttle was



Tail section of CT114079.

advanced in a last attempt to get usable thrust but the engine did not respond. Both pilots safely ejected from the aircraft while it was in a gliding descent through 1,200 ft AGL.

They sustained only minor injuries consistent with their ejection and parachute landing.

Quality Engineering and Test Establishment (QETE) determined that the engine compressor experienced a stall due to a fatigue failure of the Variable Geometry System (VGS) Feedback cable. The failure of this cable would result in the engine performance observed in this accident. All cables were quickly replaced to prevent a recurrence of this event. ♦

# ACCIDENT RESUME

Type: Air Cadet Glider C-GFME  
Date: 10 August 1995  
Location: Mountain View Airport, Ontario

## Circumstances

The student glider pilot was on a Solo 11 mission completing an approach to Runway 16. The glider overshot the landing area and came to rest in marshy ground at the approach end to Runway 34. Though the aircraft received damage to the right wing, nose cone, and fuselage, the pilot was uninjured.

## Investigation

The pilot quickly realized that the turn onto base was early and excessively high but had difficulty interpreting environmental cues and processing more than one stimulus simultaneously. Errors in adjusting for speed, then height, then the landing area culminated in the right wing striking the ground causing the glider to



Damage to the aircraft.



Right wing inboard damage.

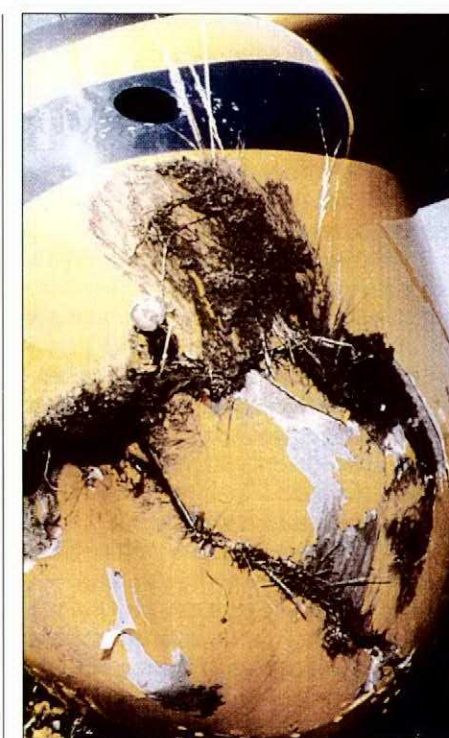
cartwheel. Though the pilot was assessed as safe for solo, evidence from the testimony suggested this was not the case.

## DFS Comments

In any training unit, student progress must be recorded in considerable detail and be monitored by supervisors.

Effective monitoring by supervisors becomes particularly important with new instructors as they have no prior experience in assessing student progress.

This mishap accentuates how weaknesses in performance that are not quickly recognized and addressed can have serious consequences. ♦



Nosecone damage.



# ICE IS NICE - IN YOUR DRINK !

by Capt M.E. Chapman, HOTEF



Waterbird aircraft '441' paddling along.

We were tasked to take the Commander of the Submarine Squadron out to the ONONDAGA to hoist him aboard. After all, it isn't everyday that we can show the submariners how much they need us!

All the options for the mission were discussed including the weather which was forecast to occasionally get as low as 2000 feet broken and 3 miles in light snow showers. That didn't sound like a problem, as we would be able to go around the showers, and had to go only 50 miles off-shore to find the sub.

Our aircraft was 414, not a "stock" Sea King, but the "Waterbird" - normally used for water landing training. It has been extensively modified; removing the Doppler Radar, Auto Hover Coupler, Direction Finding Equipment, Cabin Heater, and parts of the "Hauldown" system. The aircraft

had just flown a short mission and was not full of fuel. Time was pressing as we had to hoist in daylight. We elected to go with the fuel on board, about three hours rather than the four hours that full tanks would provide. No sweat, "it's only a short trip, right?"

During the start light snow showers started blowing across the ramp. We didn't pay much attention to them, they were forecasted to happen anyway.

We got airborne and headed South over the Atlantic. The temperature at 500 feet was -1°C with a 30 knot tail wind pushing us along. We would make it to the sub before dark, if our luck held out. The wind had blown the seas up pretty high, a three to four meter swell was running and the forecast snow showers were here and there.

The navigator had limited navigational information and was running the computer in "manual" mode. The radar operator was working hard to find our target. We encountered a snow shower and started to pick up slush and ice on the airframe. The Sea King is not equipped for, nor certified, for flight in icing. The "ICE DETECTED" light flashed frequently. It was amazing how fast ice built up. I wondered how much ice we couldn't see on the main and tail rotors. We broke out of the shower into clear ice and made contact with the sub on UHF. The ocean was a patchwork of grey water, white breakers, and snow showers. A black submarine is hard to spot on a nice sunny day, but this was going to be tough.

We still hadn't solved this puzzle when all hell broke loose on the radios with at least two stations were

calling. We climbed to the cloud base to make comms with home. The controller's voice betrayed his concern as he gave us an urgent weather warning - "Shearwater is expected to be down to a 100 foot ceiling and 1/8 of a mile visibility in heavy snow within 15 minutes! All aircraft are recalled immediately!" He added that the storm was already visible and that it was approaching rapidly from the North. We were 49 miles to the South and facing a 30 kt wind, at 150 kts that is a 25 min flight home! The race was on! Just to make things interesting, our radar failed. No amount of coaxing, cajoling, tuning or "adjusting" would make it work. Great. The radar on the Sea King is used for weather avoidance and navigation. We were down to TACAN and DR.

Another returning Sea King reports hitting the "wall" at five miles from the field. We still have 36 miles to go! The tower issues the latest weather - "Precipitation ceiling, 100 feet obscured, visibility 1/8 mi in heavy snow and ICE PELLETS!" It's starting to look like we aren't going to Shearwater tonight - Greenwood, 60 miles to the Northwest is still VFR. The voice of my met instructor haunts me "NEVER FORGET, ICE PELLETS AT THE SURFACE MEAN - FREEZING RAIN ALOFT!" We would have to climb to get over the terrain and into Greenwood. Not many helicopter pilots can describe what happens in freezing rain. Most don't survive the ride.

It is obvious we going to have to find a place to land, and soon. We can see the storm now, hanging like a colossal black curtain. It stretches as far as we can see to the West, wraps around to the East, and disappears behind us. Land is still 25 miles away and we were flying the only Sea King in the fleet that is not equipped to hover over water at night. It seems clear to the West. We go Northwest, starting to run out of daylight, fuel, options, and weather. I can clearly see the lighthouses at Chebucto Head and Sambro Is. through a chink in the storm's armour. There are several good places to land near there. Check the DME - 17 miles, the ocean is crawling by. We head towards the light. We can't do 150 kts anymore as

we hit gusts of over 20 kts. (We would later discover that the storm also contained lightning, we didn't realize we jousting with a "frozen" CB). The Cdr is crouched between the pilots, looking over our shoulders. His face showing concern; he states we have just lost the lighthouse. The wall of snow has closed in over the shoreline and sealed us off into the North Atlantic. It seems to have suddenly gotten very dark and cold, and we are starting to pick up more ice.

We turn further West, running along the wall. The centre panel of the windshield is half covered with a thickening layer of frozen slush. I recheck all the anti-ice switches, hoping for inspiration. Land is agonizingly close, 10 miles to the right, and we can't get there. We pass a brand new City class patrol frigate, the HMCS WINNIPEG, heading into Halifax harbour and just entering the wall of snow. The WINNIPEG has not completed flight deck certification and has not yet been turned over to the Navy. Nonetheless, the deck is inviting and seems stable. We aren't ready to try that . . . Yet.

We advise the tower that we are going to try to outrun the storm to the West, hoping to find a hole in the wall and a place to land. The reply chills us - "The last report from met shows the snow extending to the West for 100 miles!" A look at the fuel, and a glance at the now disappearing sun, makes it clear that our bag of tricks is empty.

The WINNIPEG is all we have left. She is invisible now, having gone north into the storm. We call her on GUARD as we take stock of our situation. There is no other place left to go. It is nearly dark and we have 1 hour of fuel left. The ship has no deck crew, no Landing Safety Officer, missing parts of the Hauldown, and nobody is current on Destroyer Deck Landings. Everything has conspired against us - our backs are to the wall. We have no options; we can't go South, nearest land that way is Bermuda - 800 miles. We can't hover in the dark, and the wall of snow is still approaching. We are picking up ice and there is freezing rain aloft.

We declare an emergency to the WINNIPEG, explaining that they are

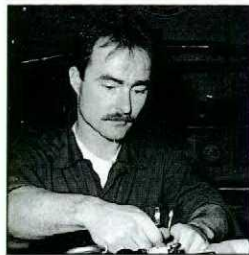
the last place on earth that we can go. I ask if they can do a 180 and try to out-run the storm. I tune in the ship's TACAN, it is only 4 DME to the North. We fly back and forth along the wall and wait. The ship's CO tells us that he will be coming our way at full speed. We all focus on the DME. As we orbit ahead of the storm, waiting for the ship, the DME creeps up to 6. We aren't going to make it.

The tower reports lifting visibility. Now we have options. Do we try for the ship or the airfield? We are 6 DME from the ship and 14 from home. We are already carrying a lot of ice, and there is more for sure along the way. The tower assures us that we will break out if we try to get through, but cautions that another wall of snow is approaching fast. The crew commander decides to try for the field - we agree. Everyone tightens their harness as we go into the wall. The precipitation is thick, it sounds like slush pounding the bottom of a car after a snowstorm. Ice creeps up the windshield and hangs from the wipers. We keep going at 500 AGL unable to climb into the severe icing that we know is above. Ice continues to build on the airframe. It is dark as night inside the storm. Finally, at 4 DME we see some lights in the harbour, and seconds later, the approach to RWY 34 breaks into view. We land a bit shaken and quiet knowing just how much of a "near thing" our flight was.

So what lessons did we learn? The flight was well briefed, flown by current and experienced aircrew. Several things conspired against us, the aircraft was not fully equipped, some critical equipment broke and the weather worsened dramatically. Air Traffic Control did everything they could and the WINNIPEG was there for us if we needed them. I sincerely wish to thank the Captain and Crew for their willingness to risk their own security by opening their flight deck to us. Throughout this sortie we tried each option as it was presented and always kept something in our back pocket, but the pocket eventually emptied. The weather is like a sleeping dog, usually predictable, but someday it just might wake up and try to take a bite at you. ♦



# FOR PROFESSIONALISM



**CORPORAL GLEN DECKER**

Cpl Decker, an Aero-Engine Tech with 14 AMS was summoned to trouble shoot a snag on a Sea King refuelling in Greenwood. The Sea King crew suspected a possible hydraulic leak in the rotor head area. Cpl Decker, who had previous Sea King experience, completed the hydraulic line inspection and then, on his own initiative, conducted a visual inspection of both engines and discovered a greasy rag stuffed under the number two engine.

The colour and location of the rag made it extremely difficult to locate. The close proximity to the exhaust pipe added a potential fire hazard to the already existing FOD hazard.

Cpl Decker's initiative and professionalism far exceeded the expectations of a transient servicing technician. His attention to detail prevented a serious flight safety incident. ♦



**SERGEANT JOHNNY OUELLET**

Sgt Ouellet, an Air Traffic Controller, was acting as a "trusted agent" for a base evaluation exercise. During this exercise, he was in the control tower monitoring ground activities.

While the Tower controllers were busy with the exercise, Sgt Ouellet noticed a corporate aircraft on short final for landing. Visually checking the runway, he noticed an airliner lined up for departure at the opposite end of the same runway. Realizing the Tower controller was not aware of the conflict, he immediately yelled "Aircraft on final overshoot!". The Tower controller repeated this instruction to the corporate aircraft on short final. The corporate aircraft immediately completed an overshoot.

Sgt Ouellet's vigilance and professionalism prevented a potential collision between two passenger carrying aircraft. ♦



**CORPORAL MICHEL PHILIBERT**



**CORPORAL DONALD HABERSTOCK**

Cpl Haberstock and Cpl Philibert, technicians with AETE, both observed a grounding cable hanging from a Kiowa in flight.

Cpl Haberstock was proceeding on a mule from AETE when he noticed the situation. He immediately informed 4 Wing Tower of his observation. Simultaneously, Cpl Philibert, while waiting to park an aircraft, also took notice. Running to the Unit's Ops Centre, he informed the Operations Officer who in turn contacted the pilot informing him of the situation.

As a result of maintaining exemplary situational awareness while on the flight line, the immediate actions of Cpls Haberstock and Philibert prevented a potentially serious aircraft incident. If the helicopter was to accelerate, the grounding cable could

have become jammed in the tail rotor creating a very serious flight control problem. ♦



**WARRANT OFFICER LEN STEAD**



**CORPORAL DAVE HARLOW**

**MASTER CORPORAL DEREK SYMONDS**  
(photo not available)

While de-snagging a minor entry for engine inlet anti-ice and master caution lights on a Labrador, MCpl Symonds and Cpl Harlow detected smoke emerging from the advisory caution panel. The panel was removed and inspected where it was determined that damage was restricted to a circuit card that controlled lighting for numerous advisory systems.

Suspecting that the advisory caution panel in this aircraft had been previously installed on another aircraft, MCpl Symonds and Cpl Harlow removed and inspected the panel on that aircraft. Identical damage was discovered. This information was reported to WO Stead who initiated contact with other SAR units across Canada where it was determined that this unsafe condition existed fleet-wide. WO Stead informed his supervisors who initiated a Summary Investigation, the results of which rectified this fleet-wide anomaly.

WO Stead, MCpl Symonds and Cpl Harlow displayed superior technical and professional abilities in identifying and solving this anomaly. ♦

# FOR PROFESSIONALISM



**MASTER CORPORAL JEFF TENG**

MCpl Teng, an Aero-Engine Tech, was tasked to perform a routine borescope inspection on the right hand engine of a CF18. On completion of this inspection, and on his own initiative, MCpl Teng proceeded to do a general area survey using the BoreScope. During the survey he noticed the fuel pressure line on the #15 fuel distributor had completely backed off from its fitting. In this state, aircraft fuel would be allowed to leak within a running jet engine, just ahead of the combustor. He immediately informed his supervisor of the problem. The engine was replaced and routed to engine bay for further investigation and repair.

Had the disconnected fuel line gone undetected, there is a very real possibility the fuel could have ignited, resulting in a fire and possible loss of the aircraft. ♦



**CORPORAL BILL KELLY**

Cpl Kelly, an Air Frame Tech, was parking a C130 on its return from a high speed taxi for anti-skid and brake functionals. Upon shutdown, Cpl Kelly noticed heat waves emitting from the right hand undercarriage

area. Positioning himself directly behind the right hand wheel, he visually confirmed open flames coming from the brake unit.

Cpl Kelly immediately entered the aircraft and directed the aircrew to request emergency response through the Tower and to evacuate the aircraft. Taking a fire extinguisher from the aircraft cabin, he returned to the fire scene and proceeded to extinguish the fire. On arrival of the fire response team the fire was declared out and the incident was secured.

Cpl Kelly is highly commended for his alertness and quick response in containing a very volatile situation which could have easily escalated into a major disaster. ♦



**CORPORAL SAM WHELAN**

Cpl Whelan, an Integral Systems Tech, was tasked to carry out a bird nest check on a C130 prior to its departure. During the inspection, Cpl Whelan detected a hairline crack on the rudder skin. He immediately informed his supervisor and upon further investigation, several other cracks were discovered. These cracks exceeded the structural damage limits for the rudder and had these gone undetected, the rudder skin could have peeled back rendering the flight control ineffective.

Cpl Whelan's detection of this serious condition clearly demonstrates his commitment to flight safety. His actions averted a potentially hazardous flight occurrence. ♦



**CORPORAL BILL BALL**



**CORPORAL MIKE RICHARDSON**

Cpl Ball and Cpl Richardson, HelAirDet members on HMCS PROVIDER, were part of a crew that was recovering a Sea King. The aircraft had just completed a hot refuelling and was in the process of folding its main rotor blades when a hydraulic line ruptured. The resulting shower of hydraulic fluid sprayed onto the hot exhaust of the running number one engine and was ignited.

Cpls Ball and Richardson immediately alerted the aircrew of the fire, motioned for an emergency shutdown of the engine and retrieved the halon extinguisher. Without fear for themselves, they advance on the fire, which had engulfed the number one engine and part of the main gear box housing, and extinguished it completely.

The courage and professionalism displayed by Cpl Ball and Richardson undoubtedly prevented the aircraft from sustaining any serious damage and allowed the aircrew to exit the aircraft safely. ♦



# THE GHOST OF CHRISTMAS PAST

by Cpl B.M. Dirks

**I**t took a long time to decide how to write this story of missed clues that could have resulted in more tragedy than we need to think about. Like all tales it has a beginning, a middle, and an end. To fully understand this occurrence we must start at the end.

The night workload was light despite the shortage of qualified Airframe techs. It was shortly after 1600 hrs on that end-of-January night. The desk MCpl gave us the go ahead to start the PI on the helicopter. I headed out to the aircraft with my ten years of rotary experience, the last four on type. It was not unusual for other trades to help out when we are short-handed. Some would do windows, and others would do the down-and-dirty stuff like cleaning the transmission area. You would think that this task is simple by nature but in fact, if done properly, it is very demanding of both your visual and touch senses. It is also very time consuming. I had allocated the job to a trustworthy IS tech.

Not long after starting the "wipe down" of the transmission, I had completed my work on top. Since the IS tech was not overly experienced in the area he was working, I decided to help out by answering his questions while he completed his task. Some of the questions he fielded to me were regarding leaks and the permissible amount of them. I promptly answered them with my vast experience. The next series of questions threw me for a loop - "How many spare bolts do you keep laying around, and why do you try to hide them?" First, I was confused, then the reality hit me like two tons of bricks as I was sent back in time to a date before Christmas - missing sync shaft bolts!

The day started with an exceptional work load. The Wing entertainment committee had started the massive clean up of the hangar for the annual Christmas party, and "we" the



A technician working on a Lab.

riggers, had to install a transmission. You could tell "we" were a thorn in their backside. Soon everything became rushed. First, the cable on the winch used to lower and raise the transmission was unserviceable. Next was the question of hardware. Several times we had to chase down members of the clean-up party and remind them to leave the equipment and parts of the helicopter alone . . . installing the transmission in this particular airframe had been historically difficult. After several hours of hard work and a few bruised body parts the transmission was in place. The next task was to install the drive shafts.

Several members of the crew looked for the nuts, bolts, and special washers used to connect the sync shaft to the transmission. No luck! It was nearing the end of the shift, so it

was decided to get new hardware. We believed that the clean-up party removed them from the work area. At the end of the shift we had installed the transmission and connected all associated drive shafts and lines.

The party was a success.

Now let's travel back to the future. "How could this happen?", was the first question that I asked (myself). It did not take too long for me to have the answer.

There are several contributing factors that are responsible for this incident. The first is housekeeping. How many times have we been told not to leave parts or hardware on the aircraft. We all know that when you remove parts you bag and tag them. This simple act could have prevented this embarrassing situation.

The next factor is inattention. Inattention to the job that we were involved with directly led to frustration. The constant badgering from the clean-up crew caused us to skip very important steps. When we could not find the hardware we should have contacted the crew who dropped the transmission and asked them where the bolts were. Then if we could not find them - call for a FOD check for the missing hardware.

The lack of proper handover was also a contributing factor. If at the time of the handover we were told of the location of the bolts, you would not be reading this article.

Perhaps the lack of proper supervision is partially responsible. If a per-

son who removed the bolts from the sync shaft was not working in trade, he should have been instructed on the proper removal technique. The next level of supervision should have prevented the clean-up crew from coming within 50 feet of the aircraft.

At the end of it all, it is important to remember what part you could have played in this potentially serious situation, and NOT LET IT HAPPEN AGAIN.

Let's not forget that the parts were in the helicopter for 50 days and flew more than a hundred hours. It is particularly frightening to think of the damage they could have caused. What about the previous PIs? Why didn't the bolts turn up before? The heli-

copter also had a SUPP check - nothing found!

If the Ghost of Christmas Past is going to rear its ugly head, I hope that it is in my dreams, and not in my occupation. I strongly believe that this story needs to be told so that we can slow down and take a closer look at our abilities as people and technicians. It would be almost impossible to count the number of people who had a role to play in this occurrence.

I hope that all of your late Christmas presents are more pleasant.

Cpl Dirks is an Airframe Technician based at 8 Wing Trenton. ♦

## FLYING PROFICIENCY VS THE CHAIRBORNE PILOT

**A**n interesting article that was published in *Flight Comment* Jul/Aug 1960. The message applies to everyone that is able to break free from the clutches of an ergonomically designed chair and matching computer desk. ed

The demands of our modern-day Air Force have chained many of our most experienced pilots to their desks. As a result, with few exceptions, the flying proficiency of these pilots has suffered a gradual disintegration.

At first, the new desk-bound pilot fights for every hour of flying time he can get; however, as time passes, he becomes more and more involved with the demands of his administrative duties, and his interest and will to fight for flying time suffers proportionately. Eventually he finds his knowledge of emergency procedures becomes rusty, his traffic patterns are no longer precise, his habit patterns dim and fade, and his precision instrument work loses its polish and requires great concentration and

effort. Often he hears the less experienced and less constrained pilots speak sneeringly of "desk pilots". At this point, a feeling of inferiority sets in and he resigns himself to "fighting for twenty-five".

If he is fortunate, he recognizes his state of proficiency and establishes his personal weather minimums and is very conservative in his flying. His outlook at this point is to live to a happy retirement or die with a heart attack as a result of his sedentary life and administrative frustrations.

If he is unfortunate, he may be low in flying proficiency but high in confidence or pride. He is now a real menace to himself, and to the military personnel and equipment entrusted to him. Bad weather and mechanical difficulties can compound into severe trials for the most proficient pilots - and fatal nightmares for the unproficient. Under adverse conditions, the little things: frequencies, headings, emergency procedures, etc., can make all the difference. Under very adverse conditions, the experienced but more

cautious pilot would be safely on the ground, awaiting a break in the weather or proper repair of mechanical difficulties. Needless to say, the unproficient but confident and proud egoist has the odds stacked against his reaching retirement.

Sometimes our "desk-bound pilots" are returned to flying jobs. It is amazing how rapidly proficiency is re-attained. The wise pilot is already acutely conscious of his shortcomings and after a month or so of intensive flying, he can also afford a feeling of confidence and pride in his flying ability. It is nice to be alive. How does this fit into flying safety? All of us, including the pilots who sneer at the "desk-bound", are destined to be constrained from the joy of full-time flying at one time or another. If you are unable to maintain high flying proficiency, it is vital that you recognize this fact and do everything possible to keep the odds in your favour. Don't let false pride or overconfidence overcome your good judgement. ♦



# FLIGHT SAFETY



## JANUARY JANVIER

| SUNDAY<br>DIMANCHE | MONDAY<br>LUNDI                     | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI | THURSDAY<br>JEUDI | FRIDAY<br>VENDREDI | SATURDAY<br>SAMEDI |
|--------------------|-------------------------------------|------------------|-----------------------|-------------------|--------------------|--------------------|
|                    | 1<br>New Year's Day<br>Jour de l'an | 2                | 3                     | 4                 | 5                  | 6                  |
| 7                  | 8                                   | 9                | 10                    | 11                | 12                 | 13                 |
| 14                 | 15                                  | 16               | 17                    | 18                | 19                 | 20                 |
| 21                 | 22                                  | 23               | 24                    | 25                | 26                 | 27                 |
| 28                 | 29                                  | 30               | 31                    |                   |                    |                    |

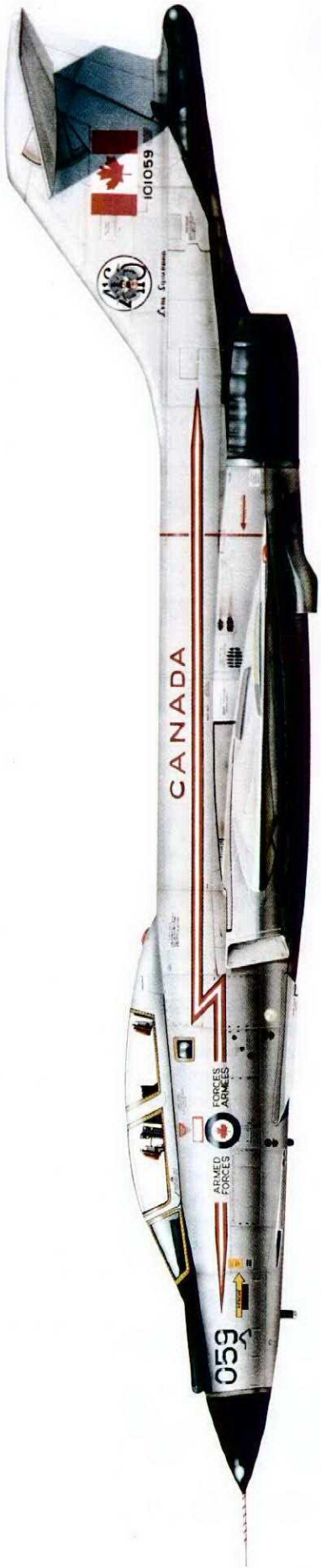
## FEBRUARY

| SUNDAY<br>DIMANCHE | MONDAY<br>LUNDI | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI |
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| 4                  | 5               | 6                |                       |
| 11                 | 12              | 13               |                       |
| 18                 | 19              | 20               |                       |
| 25                 | 26              | 27               |                       |

**M**cDonnell CF101B Voodoo of 116 Squadron. The Voodoo entered service in 1961 and was retired in 1984. A large aircraft, the Voodoo had a max overload gross of 46,673 lbs, a service ceiling of 51,000 ft, an initial climb rate of 17,000 ft/min and a max speed of 1,220 mph at 40,000 ft.

The Voodoo is part of the CANAV collection donated to Air Command by Larry Milberry.

artist: Peter Mossman



# McDONNELL CF101B VOODOO



# SÉCURITÉ DES VOLS

## F É V R I E R

| SUNDAY<br>DIMANCHÉ | MONDAY<br>LUNDI | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI | THURSDAY<br>JEUDI | FRIDAY<br>VENDREDI | SATURDAY<br>SAMEDI |
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| 7                  |                 |                  |                       | 8                 | 9                  | 10                 |
| 14                 |                 |                  |                       | 15                | 16                 | 17                 |
| 21                 |                 |                  |                       | 22                | 23                 | 24                 |
| 28                 |                 |                  |                       | 29                |                    |                    |

## M A R C H M A R S

| SUNDAY<br>DIMANCHÉ | MONDAY<br>LUNDI | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI | THURSDAY<br>JEUDI | FRIDAY<br>VENDREDI | SATURDAY<br>SAMEDI |
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| 3                  | 4               | 5                | 6                     | 7                 | 8                  | 9                  |
| 10                 | 11              | 12               | 13                    | 14                | 15                 | 16                 |
| 17                 | 18              | 19               | 20                    | 21                | 22                 | 23                 |
| 24                 | 25              | 26               | 27                    | 28                | 29                 | 30                 |
| 31                 |                 |                  |                       |                   |                    |                    |

## M A I

| SUNDAY<br>DIMANCHÉ | MONDAY<br>LUNDI | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI | THURSDAY<br>JEUDI | FRIDAY<br>VENDREDI | SATURDAY<br>SAMEDI |
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| 1                  |                 |                  |                       | 2                 | 3                  | 4                  |
| 8                  |                 |                  |                       | 9                 | 10                 | 11                 |
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| 29                 |                 |                  |                       | 30                | 31                 |                    |

## J U N E J U I N

| SUNDAY<br>DIMANCHÉ | MONDAY<br>LUNDI | TUESDAY<br>MARDI | WEDNESDAY<br>MERCREDI | THURSDAY<br>JEUDI | FRIDAY<br>VENDREDI | SATURDAY<br>SAMEDI |
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| 9                  | 10              | 11               | 12                    | 13                | 14                 | 15                 |
| 16                 | 17              | 18               | 19                    | 20                | 21                 | 22                 |
| 23                 | 24              | 25               | 26                    | 27                | 28                 | 29                 |
| 30                 |                 |                  |                       |                   |                    |                    |