FLIGHT COMMENT

SEPTEMBER OCTOBER
1974

Comments

Passengers in T33 aircraft have been known to unintentionally jettison canopies and tip tanks as well as unintentionally turn off the fuel. Here's another case – this time unintentional hypoxia.

A T33 took off on a night training mission with a non-jet qualified passenger in the rear seat. The aircraft flew between 20 and 25 thousand feet for the first one and a half hours and then climbed to 35 thousand feet for the remainder of the mission. (The cabin pressure at this altitude was 23-24 thousand feet.) After approximately five minutes at 35 thousand the pilot turned on his intercom to ask his passenger a question. The pilot's report:

"... When he answered it sounded like a tape recorder playing back at slow speed. I knew he had hypoxia. I declared an emergency and started an immediate rapid descent to below ten thousand cabin altitude. I told him to pull his bailout bottle, as I figured he was too far gone to go through the rest of the check. As soon as we reached a lower altitude he came around. He said he heard me ask him to pull his bailout bottle, but couldn't co-ordinate himself to do so. I then told him to go 100 percent oxygen and emergency pressure. After a few minutes I took him off emergency pressure and landed from a straight in approach..."

A detailed investigation of this occurrence revealed no problems with the aircraft oxygen equipment or the oxygen cart. However, the passenger was wearing a borrowed helmet and the mask was poorly fitting with considerable leakage around the nose and chin. He also mentioned that he had removed his mask at altitude at least twice to scratch his nose.

Here is a case where the lessons taught at HAI were either forgotten or ignored. The mask was a poor fit and was not tightened sufficiently. The oxygen blinker action was not checked and the hypoxic condition was *not* self diagnosed. This incident once again stresses the need for careful briefing and monitoring of non-jet qualified passengers.

Flight Comment has a continuing requirement for interesting photographs related to aircraft operations. If you have any colour or black and white pictures that you would like to share with our readers – send them along. Even if your contribution doesn't make the front cover we still need lots of current photos for our articles. If you don't have any photos we're sure you have an interesting story or anecdote to tell. If you like – just send us an article and we'll supply the photos to go with it.

NATIONAL DEFENCE HEADQUARTERS
DIRECTORATE OF FLIGHT SAFETY

COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

MAJ O. C. NEWPORT
Education and analysis

LCOL F. G. VILLENEUVE
Investigation and prevention

Editor Maj. F. K. Lawlor
Art and Layout J. A. Dubord
Graphic Arts

Flight Comment is produced by the NDHQ Directorate of Flight Safety. The contents do not necessarily reflect official policy and unless otherwise stated should not be construed as regulations, orders or directives. Contributions, comments and criticism are welcome; the promotion of flight safety is best served by disseminating ideas and on-the-job experience. Send submissions to: Editor, Flight Comment, NDHQ/DFS, Ottawa, Ontario, K1A 0K2. Telephone: Area Code (613) 995-7037. Subscription orders should be directed to Information Canada, Ottawa, Ontario, K1A 0S9. Annual subscription rate is $1.50 for Canada and $2.50 for other countries. Remittance should be made payable to the Receiver General of Canada.

HIGNELL PRINTING LIMITED, WINNIPEG
02GX12486-2080

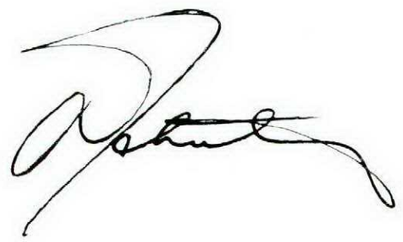
WE ONLY DELUDE OURSELVES

Even in this age of enlightenment some people involved with aviation still appear reluctant to accept the fact that a dynamic flight safety program is an integral part of the operation. Quite possibly this attitude stems from a lingering conviction that flight safety is for "peace time only" – something to be ignored or played down as soon as a real operational situation develops.

While this may be overstating the case, such negative attitudes do exist and it is time we recognized that in any operation, hot or cold, it is essential to strike a balance between the risks taken and the objectives to be gained. The point at which a realistic and acceptable balance is achieved seldom remains static and certainly a change from a peace time to a combat situation will demand a drastic reconsideration of all factors. Then the need to assess risk versus gain is even more critical. Your accident prevention program must have been well thought out, firmly established, and accepted by all the players *"before the fact"*. You may not have time to develop *"after the fact"* measures to prevent the accidental loss of irreplaceable resources even though those resources have suddenly become infinitely more valuable.

We are not alone in pressing for a critical examination and re-examination of everything we do in relation to accident potential. The need is recognized by most air operators and is illustrated in these recent words of Air Vice Marshal Lagesen, Deputy Commander of RAF Germany:

> *"The time has come when we must begin to examine all that we do in the light of the fact that the prevention of accidents is becoming paramount. We must ensure that every task is operationally viable, within our known capabilities, and involves no unnecessary risks".*



COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

HATS, WIGS *and things*

Capt R.E. Noble
DCIEM

"My head is twice as big as yours they therefore needs must fit"

William Cowper 1731-1800

John Gilpin lost his hat and wig not once but twice as he flew along on his horse. Mr Cowper stated that the reason John lost his headgear was because it was too big. John obviously had a fitting problem. Five aircrew lost their helmets (but not their toupees) as they flew out of their aircraft.

Helmet retention continues to be a problem but if you conduct an analysis of the five losses (Tables 1 and 2), four of the helmets, in my opinion, could have been retained provided they were properly fitted. Of course there were other things, such as visors up and chinstrap breaklinks which contributed to the helmet losses. It is apparent that a properly worn and fitted helmet will enhance helmet retention.

TABLE 1
EJECTIONS (NON-FATAL)

Year	Ejections	Helmet Retention	Helmet Loss
1972	2	2	0
1973	13	8 (1 USAF Helmet)	5

TABLE 2
HELMET LOSS

Total	Assessed
5	1 forced off – man/seat collision – probably fitting 1 partly burnt off – probably fitting 1 probably fitting – loose nape strap 1 forced off – mid-air collision 1 breaklink chinstrap broke as designed – probably fitting

Any procedure for fitting aircrew helmets should result in a good compromise between a snug fit for maximum noise exclusion and a comfortable fit that can be tolerated for flights of long duration. The key to successful fitting of the helmet is that the helmet be comfortable.

Comfort in an aircrew helmet must be defined as minimizing the discomfort of carrying a weight on the head. The weight of the current helmet before all the things are added on is two pounds four ounces. However, add intercom, oxygen mask assembly, dual visors and the weight increases to four pounds six ounces. Combine the weight, consider the moment of inertia, the location of helmet centre of gravity, equal pressure on the scalp, a comfortable temperature and humidity level and then not fit the helmet properly – the result will be an uncomfortable helmet and possible loss during ejection.

Although optimum pressure distribution can best be achieved with soft pads or net suspension in a helmet, acceptable pressure distribution can also be achieved with webbing suspension. Net or webbing suspension are preferable because of their superior ventilation characteristics. Both types of suspension are in the current aircrew helmet.

Basically a poorly fitted helmet is too small or too large. The symptoms of a helmet which is too small, photo 1: the dual visors will not meet the oxygen mask; the rubber beading on the back edge of the helmet is worn off; the helmet is perched on the top-back of the head; the inner is tight around the forehead and the buckles on the suspension straps are digging into the scalp. The helmet is uncomfortable.

The symptoms of a helmet which is too large, photo 2: the head can turn around inside the helmet; the cheek flaps of the inner helmet interfere with the oxygen mask suspension; the chinstrap cannot be tightened properly and sound attenuation is poor. The helmet is probably comfortable.

The symptoms of a properly fitted helmet which is the correct size, photos 3, 4, 5 and 6: the helmet shell protects the head just above the eyebrows, over the top and down below the occipital bone – that small lump on the back of your head (some occipits are more pronounced than others). The suspension of the inner net helmet combined with the two diagonal straps and the circumferential strap will be even. Note in photo 7 that there is approximately ½ – 1 inch clearance between the scalp and the energy absorbing liner. If you are wearing your helmet in this manner, it should be refitted. The clearance between the two gives you added protection plus ventilation for comfort. The ears should fit comfortably into the earcups; the dual visors should meet the oxygen mask; the nape strap should be snug below the occipital bone; you should be able to rotate your head and helmet as one; the helmet should be very comfortable.

Other things that influence a poor fit are improper adjustment of the straps which will cause hot spots on the head. A loose nape strap – and you'll know it is loose because you can't feel it, allows the helmet to rotate from front to back when the oxygen mask is tightened. A loose nape strap also compromises helmet retention. As a simple test, grasp your helmet by the front and back and chances are you can rotate your helmet off your head from back to front. I would inject a word of caution here. Be careful if you have a large Adam's apple. The chinstrap may bruise it with the result that your yodelling capabilities may be compromised.

You should be able to insert your fingers between the energy absorbing liner and the circumferential strap in the front and back. If you can't then refitting is indicated. Ensure that your ears are not touching any part of the earcup. Incidentally, facial features influence the size of the earcup. For example, you may require an intermediate size inverted earcup on the left size and a large size upright earcup on the right side, particularly those of you who are exuberant wrestlers at T.G.I.F. There are a variety of combinations of earcup sizes that can be used to obtain a safe, comfortable fit.

The responsibility of fitting helmets lies with the safety systems technician and the fitting instructions are contained in T.O. C22-010-004/MF-000. *It is imperative that helmets be fitted – not merely issued.* Aircrew can assist in the fitting procedure by observing the following guidelines:

- Allow yourself sufficient time to be properly fitted, i.e., 1–2 hours
- Ensure that your helmet is fitted by a technician familiar with the fitting procedure
- Wear the helmet in a manner that gives you full benefit of protection
- Try to form a habit of donning the helmet by rolling it on your head from front to back
- Remember that the length of your hair will affect the fit of your helmet

cont'd on next page

Photo 1 Too small

Photo 2 Too large

Photo 3 Correct size side view – DH 41-2 Jet helmet

Photo 4 Correct size front view – DH 41-2 Jet helmet

Photo 5 Correct size side view – type 411 helmet

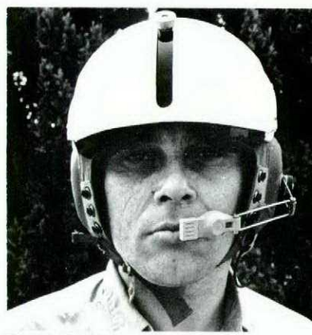


Photo 6 Correct size front view – type 411 helmet

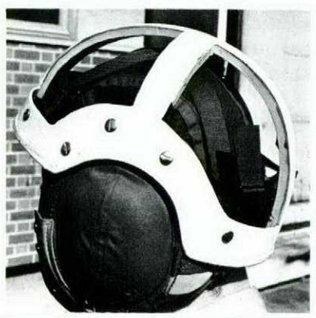


Photo 7 Correct fit for ventilation

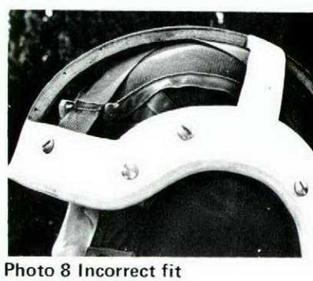


Photo 8 Incorrect fit for ventilation

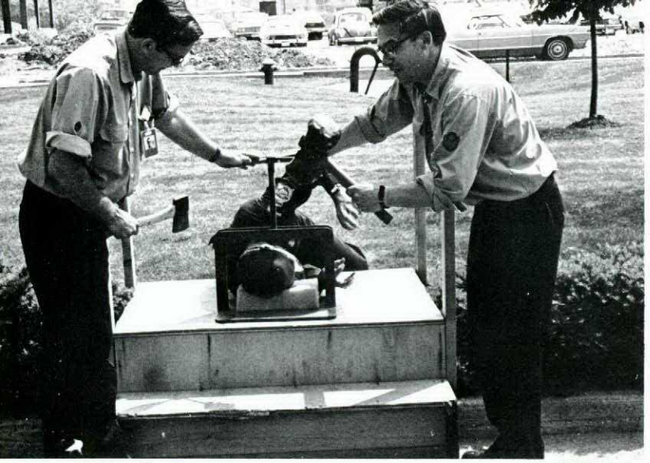


Photo 9

Photo 10

DCIEM helmet fitting team

To assist safety systems technicians, the Technical Order will soon be revised to include a pictorial description of fitting helmets. But there will still be individuals who visit DCIEM for a special fitting. We can boast that we can fit any shape of head and to be fair to those who contemplate a visit photos 9 and 10 show how we do it. We, and the manufacturer, are investigating a simpler method of fitting helmets.

Although the retention of helmets is still cause for concern, every effort is being made to improve the retention capability. It appears that improving the fitting techniques will go a long way towards ensuring one hundred percent retention. The hats and wigs (toupees) will stay on tight and other things, such as visors down and chinstraps snug, will ensure that we have no John Gilpins losing their headgear.

Keep Your Head

The front rotor blades on the CH147 Chinook helicopter can dip down as low as 4 ft 4 ins!

GOOD SHOW

Flt Lt D.L. Leach

MCpl E.D. Cook

Cpl Lafleche and Cpl Boudreault

MCpl K.R. Miller

FLT LT D.L. LEACH

Flt Lt Leach, a Royal Australian Air Force exchange officer, was returning from a training mission in a CF104D when the nose gear failed to indicate down for landing – without corresponding horn or red lights. Flt Lt Leach overshot and flew past the tower for a visual inspection. Tower advised that three gear appeared to be down. Flt Lt Leach selected gear up on the overshoot and tried another down selection – with the same results. He then selected gear up and made an emergency extension. Again there was no indication for the nosewheel, no horn and no red lights.

An inspection by another aircraft confirmed that the nose gear was not locked down but was 15 to 20 degrees aft of the vertical: the nosewheel was also cocked slightly to the left. Flt Lt Leach attempted to lower the gear by applying 'g', but the chase aircraft observed that this caused the nose gear to move further aft to the 45 to 60 degrees point. In a final attempt to get the nosewheel down prior to ejection, Flt Lt Leach decided to bounce the aircraft on the main gear. Following a hard landing on the main wheels the nosewheel continued to show unsafe; however, Flt Lt Leach eased the nose down until he felt the wheel touch the runway and correctly concluded that it had locked in position.

Flt Lt Leach demonstrated his professional knowledge and capabilities throughout this incident. His actions prevented a double ejection and the loss of the aircraft.

MCPL E.D. COOK

As the Dakota landing gear was selected down during an approach, MCpl Cook, the technical crewman, noticed that hydraulic fluid was being forced out of the auto-pilot emergency shut-off valve under high pressure. Despite the hazard and severe discomfort of hot hydraulic fluid spraying onto his clothing and in his face, MCpl Cook hand-held this flow in check until a safe landing was accomplished.

Had this flow not been stopped, all the hydraulic fluid would have been forced out of the system, causing a complete loss of hydraulic services and possibly a major accident.

MCpl Cook is commended for his outstanding display of initiative and technical professionalism in alleviating this very serious problem.

CPL J.L. LAFLECHE AND CPL J.E.A. BOUDREAULT

During a post-start inspection of a CF101 aircraft, Cpl Lafleche noticed a small amount of hydraulic fluid on a line to the port flap. He brought it to the attention of the senior crewman, Cpl Boudreault, who signalled the pilot to recycle his flaps. When the flaps were selected up a hydraulic line in the port wheel well separated with a resultant massive hydraulic loss. The ground crew immediately signalled for an engine shut down.

The conscientious inspection done by this crew plus their initiative in suggesting a recycling of the flaps prevented a serious emergency situation from developing during takeoff. The loss of a hydraulic system – or more seriously a split-flap condition – would have been the result when the flaps were retracted on takeoff.

MCPL K.R. MILLER

MCpl Miller was carrying out a periodic inspection of a CH135 helicopter when he detected what appeared to be a scratch in the main lift beam. He carried out a dye penetrant inspection of the area and found that the scratch was in reality a hairline crack in the helicopter's main lift beam.

As a result of MCpl Miller's efforts a special inspection was carried out on the CH135 fleet and unacceptable cracks were discovered on six other helicopters.

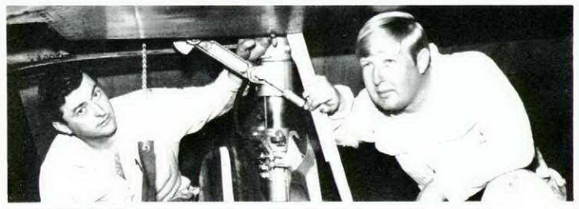
MCpl Miller's dedication to good aircraft maintenance practices and his attention to an area that is not normally inspected resulted in the special inspection as well as a repair and modification procedure which undoubtedly prevented the CH135 fleet from flying in a dangerous condition.

MCpl J.A.M. Leclerc

MCpl W.J. Comeau

Cpl B.A. Daniel

MCpl F.M. Hurley



Cpl G.R. Campbell and Cpl S.B. Dunnett

MCPL J.A.M. LECLERC

While Cpl Leclerc was installing the aft section of a CF5 he noticed that a bolt was protruding above the skin. This particular bolt is a main attachment point for the stability augmenter system actuator support bracket – a vital flight control component. A closer inspection revealed that this bolt was actually sheared.

This failure could only be detected through professional alertness since this item is only called for on a 200 hrs inspection. Cpl Leclerc is commended for his attentiveness in discovering this potentially hazardous situation.

MCPL W.J. COMEAU

MCpl Comeau, an airframe technician, recently uncovered a potentially dangerous situation on a CF104 aircraft undergoing depot level inspection at the Aircraft Maintenance Development Unit. While carrying out a check of the engine air intake ducting – a check which is not normally carried out at this stage of the inspection – MCpl Comeau discovered a very slight bulge on the left hand fairing assembly. Further investigation by MCpl Comeau revealed that the fairing was cracked in two places, one crack measuring three inches in length, the other six inches. If this fairing had broken away during flight, FOD would have been ingested into the engine with possible loss of aircraft and/or life.

Although this area had been inspected, passed and signed for, it was MCpl Comeau's initiative, interest and high calibre of professionalism that led to a final check and prevented a potentially serious accident or incident.

GOOD SHOW

CPL B.A. DANIEL

While awaiting the arrival of a passenger for a trip to a northern airport Cpl Daniel decided to carry out an extra external check of the aircraft which had been run up and was parked on the ramp. He noticed a few small drops of hydraulic fluid on the cowling of the left engine and on further investigation discovered a large leak in the vicinity of the hydraulic pump. He brought this to the attention of the aircrew and the aircraft was then grounded. It was later discovered that the engine driven hydraulic pump had failed during the run up.

Cpl Daniel is commended for his display of initiative in carrying out the extra check. His conscientious effort in tracing the leak to its source prevented the occurrence of an inflight emergency.

MCPL F.M. HURLEY

During a Tactical Air Lift training mission in a Buffalo MCpl Hurley noticed that a wing inspection panel hinge had worked loose, allowing the panel edge to project into the slipstream. He immediately brought the fact to the attention of the aircraft commander whereupon the aircraft was brought back to base at reduced speed thus averting loss of the panel and further damage to the aircraft. MCpl Hurley is a traffic technician and his discovery of the loose panel was not during part of routine or required checks but was as a result of his own initiative and diligence.

CPL G.R. CAMPBELL AND CPL S.B. DUNNETT

Cpl Campbell and Cpl Dunnett were assigned to a special inspection of T33 aircraft to check the torque value of the forward main gear trunnion bolts. The two airframe technicians also checked the rear main gear trunnion bolts although this was not specified in the inspection. On two separate aircraft these bolts were only better than finger tight. On their own initiative the two technicians then notified ATRI and an inspection was immediately introduced on all unit T33 aircraft.

Through their professional knowledge and attention Cpl Campbell and Cpl Dunnett probably averted an inflight or ground failure of these components.

CPL R. DALGLIESH AND CPL A.M. DOWN

During a Periodic Inspection of a Hercules Cpl Down and Cpl Dalgliesh were assigned to the tail section. While performing a visual inspection of the rudder trim they went beyond the card requirements, carried out a functional check and discovered excessive looseness in the trim tab assembly. They began removing panels methodically from the trim tab forward and discovered play between the trim actuator and the mounting bracket. They removed the actuator and found that the mounting bracket holes were elongated. Incorrect size bolts had been installed. The mount bracket and actuator were replaced along with the correct bolts and nuts thereby removing all play from the trim tab.

Through their professionalism and perseverance Cpl Down and Cpl Dalgliesh detected a condition which could have become a serious inflight hazard. The resulting special inspection of the fleet revealed that another base aircraft had the same problem.

CPL B.F. MCDONALD

While conducting a preflight inspection on a Buffalo aircraft, Cpl McDonald, a student flight engineer, discovered a crack in the co-pilot's aileron lever assembly which could have resulted in an inflight failure. The area in question is in the nose section, beyond the normal scope of the flight engineer's preflight check and probably would not have been inspected for another 60 flying hours, at which time the aircraft was due for a maintenance inspection. Cpl McDonald is commended for his alertness and attention to detail which prevented the development of a potentially serious flight safety hazard.

CPL C. LONG AND CPL M.G. ROSE

Cpl Long and Cpl Rose were replacing an unserviceable bleed air valve on a C130 aircraft when they noticed what appeared to be small pieces of insulation from the bleed air manifold in the dry bay area. Investigating further, they determined that the small pieces of insulation came from a crack in the bleed air manifold. Had this situation gone undetected, the crack would have enlarged, causing a serious bleed air leak and subsequent possible overheat or fire warning in flight.

Cpl Long and Cpl Rose averted a possible inflight emergency by their persistence and professional approach towards their duties.

CPL K.W. WIEBE

While towing a CF101 aircraft from the hangar to the flight line, Cpl Wiebe, who was the NCO in charge of the tow crew, heard an unfamiliar noise coming from the right side of the aircraft. He immediately gave orders to cease towing and carried out a close inspection of the right hand main landing gear. Not finding any defects visible Cpl Wiebe requested that the aircraft be moved forward very slowly and, after a few feet, the noise was traced to the right main wheel. He then had the aircraft parked in the nearest parking spot on the flight line, made the appropriate CF 349 entry and personally debriefed the snag section on this unserviceability. It was later revealed that the main wheel bearing was dry of lubrication and the wheel retaining nut had been over-torqued.

Cpl Wiebe's alertness and initiative in investigating this noise prevented the possibility of a wheel bearing seizure on the next takeoff or landing.

MCPL R.W. CASS

While carrying out an independent inspection on a Hercules Rudder Trim Actuator, MCpl Cass decided to delve into the rudder assembly for a general condition check although it was not a requirement on this inspection. Using a mirror and flashlight through a very small inspection hole he noticed the trim actuator mount bracket bolts were not in "safety". Further investigation revealed that although the bolts and washers were of the correct specification, the anchor/locking nuts were applicable to the earlier series aircraft prior to an engineering change. Although no evidence of looseness was discovered, this situation was promptly rectified.

By his alertness and dedication MCpl Cass located and rectified a potentially hazardous situation.

Cpl R. Dalgliesh and Cpl A.M. Down

Cpl B.F. McDonald

Cpl K.W. Wiebe

MCpl R.W. Cass

Cpl C. Long and Cpl M.G. Rose

T33 Parachute Pack Failure

The Story of UCR No. 4208/A37

E. Dennis Kenzie
Irvin Industries
Canada Limited

How can a parachute pack, which has been designed to open when a maximum pull of 30 foot pounds is applied to the rip cord, possibly fail to open when a force greater than 150 foot pounds is exerted by the power spring of the embodied MK10A opener? It happened (fortunately not in an emergency situation) and the matter became the subject of UCR No. 4208/A37.

A program was formulated which would involve a selected team of Irvin Industries Canada Limited personnel to examine the whole structure of the subject parachute pack assembly.

The U.C.R. referred to damage marks observed on the groove in the spring cover and on the stop piece, which is fitted to the end of the power cable. Examination confirmed that the marks were present and this supported the statement contained in the U.C.R. that the stop piece had struck the spring cover when the MK10A opener was activated and jammed in the groove, thereby preventing normal operation of the system.

Such evidence pointed to the presence of a fault in the relationship between the manual rip cord cable and the MK10A power cable which permitted the stop piece to adopt a position whereby it could foul the spring cover.

Nevertheless the whole program plan was pursued until the possibility of other residual faults was eliminated. The pack, the MK10A opener and all the associated cables, housings and fittings were found to comply to the drawings and specifications in every detail. Each component was up to date to all drawing revisions.

The problem now facing the investigating team was to try to reproduce the failure as reported in the U.C.R. As any reader who has been involved in investigations of this nature will know, this more often than not proves difficult to achieve. Vital evidence is sometimes destroyed during the actual investigation, in spite of much care being taken to avoid this happening. In many cases the fault corrects itself and repeated attempts to reproduce it are fruitless. The most conscientious of investigating committees is then left with no choice but to conclude: "an isolated case".

Not so in this particular case. By setting up the system to recreate the most likely mode for failure, a failure was produced. However, in any other position the system operated successfully. The cause of the failure was thus pin-pointed and was, as suspected earlier, contained within the relationship between the manual and power cables. It was discovered that a combination of two physical situations could exist to result in a failure of any similar parachute assembly.

The two situations, which are depicted in Figure 1, are: (a) partial withdrawal of the rip cord pins to leave only approximately 5/8 inch protruding through the pack closure cones and (b) a slight bend in the power cable adjacent to the stem of the stop piece.

The partly withdrawn rip cord pins allow the power cable to move to the extent that the stop piece escapes from its location in the plunger. The bend in the cable causes the stop piece to deflect into the groove in the spring cover.

With this set of conditions created on the subject pack assembly, the MK10A was operated and the plunger struck the stem of the stop piece and jammed it in the groove, thus preventing free ejection of the plunger to effect total withdrawal of the rip cord pins.

Subsequent examination of the stop piece and the spring cover revealed damage identical to that observed during the preliminary examination. This was evidence to support the almost certain knowledge of the cause of the original failure.

It is not possible to determine how the rip cord pins came to be partially withdrawn to the critical position which contributed to the original failure. Whatever the answer, it is of little consequence. Complete satisfaction can only come from taking appropriate action to positively prevent any recurrence of the failure.

Action is being taken which will involve the introduction of a redesigned stop piece to increase the length of the stem by 3/4 inch. Such an increase in length will ensure that the stem cannot possibly come out of its location in the plunger even if the rip cord pins are minimally engaged in the pack closure cones, (Figure 2). As an additional safeguard, a larger chamfer on the front edge of the head of the stop piece is specified.

In the meantime satisfy yourself by taking a few seconds to look at your rip cord pins before clambering into your aircraft. We hope you never have to eject but if you do you can rely on the chute opening.

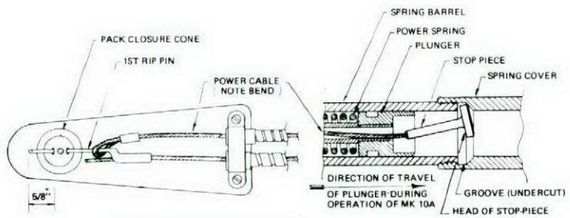


FIGURE 1 SHOWING CAUSE OF FAILURE

LEFT: RIP PIN PARTLY WITHDRAWN FROM PACK CLOSURE CONE.
RIGHT: STEM OF STOP PIECE OUT OF ALIGNMENT WITH PLUNGER AND HEAD OF STOP PIECE FOULING GROOVE

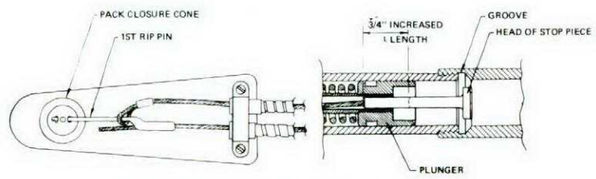


FIGURE 2 SHOWING EFFECT OF MODIFIED STOP PIECE

LEFT: RIP PIN ALMOST TOTALLY WITHDRAWN FROM PACK CLOSURE CONE.
RIGHT: EXTENDED STEM OF STOP PIECE LOCATED IN PLUNGER ELIMINATING POSSIBILITY OF HEAD OF STOP PIECE FOULING GROOVE.

ASTROLOG

libra

Sep 24 to Oct 23

Aircrew born under the sign of Libra usally find true contentment only as a crew member in a multi place aircraft. This natural urge for unity with others doesn't mean that Libra will be busy setting up a labour union in the back end of an Argus or calling for a strike vote among the cabin crew of a 707 but he is always at his best when working with a group. The ideal role for Libra is as one half of a partnership and he therefore makes an admirable co-pilot — being mentally active, communicative, diplomatic and co-operative. As an aircraft captain however, our Libra may encounter some problems. He dislikes making instant decisions and his title "Lazy Libra" is often just a cover: this apparent laziness may well be indecisiveness. Like the scales which move up and down, seeking equilibrium, so Libra weighs the pros and cons of a situation so long that he goes from one extreme to the other without ever finding that happy medium. Any decision he does make during this balancing process may well be completely out of phase with the requirement.

For all his indecision Libra is still charming, kind and easygoing. He feels unhappy where there is conflict or discord and will do anything for peace and harmony. He loves to play the part of the peacemaker. If your co-pilot is a Libra then watch him at work, carefully synchronizing those engines — striving to achieve a perfect balance. If you're still not sure check his legs sometime. He's bound to have Venus dimples in his knees.

scorpio

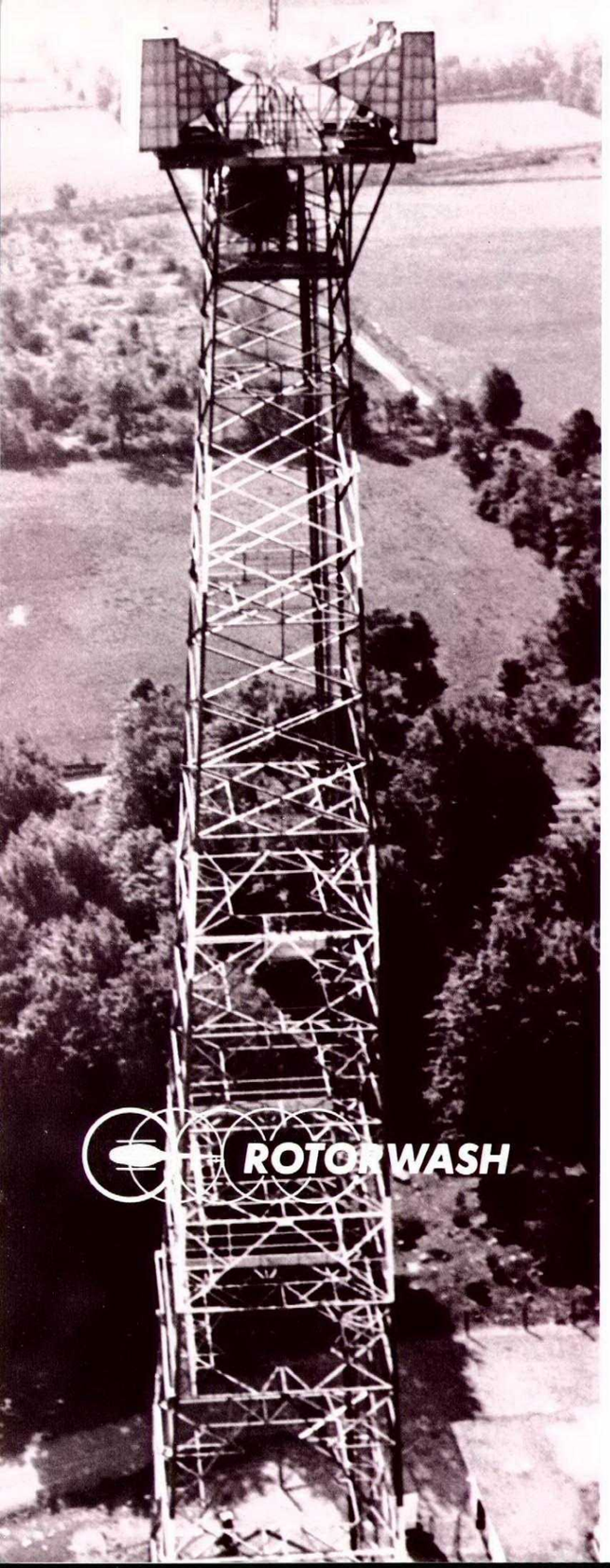
Oct 24 to Nov 22

In mythology the Scorpion caused the horses of the sun to bolt when driven for a day by the boy Phaethon and Jupiter rebuked it with a thunderbolt. If you take a close look at the Scorpio in your squadron then you'll probably agree that it would take a thunderbolt to stop him once he gets moving. Scorpio is a persistent and determined individual with a highly developed sense of purpose. He is definitely at home in the Armed Forces and especially in the cockpit of a fighter type aircraft.

Scorpio is interested in winning and he's quite willing — and able — to force his way to the front in any contest — even if it means treading on a few toes to get there. Don't leave him out of the team for the annual weapons meet unless you want his long-lasting resentment. He'll fix you with his piercing eyes and tell you quite bluntly that he's the best flier you've got — and it may well be true.

Scorpio isn't interested in half measures. Anything less than one hundred per cent isn't good enough and he'll continue to push himself to the limit of his ability. If there's a flying trophy to be won Scorpio is determined to be the victor. The same holds true in sports. If your Scorpio driver is off flying duties it may well be as a result of an accident in a football game or else falling off the crud table.

You can count on intense loyalty if Scorpio is your friend but don't expect any quarter if he's your enemy. He's ruled by Pluto who also rules nuclear power and this explosive character can be vindictive and destructive. He unconsciously seeks violence as a challenge to his strength. The fighter pilot Scorpio should remember that the Scorpion occasionally stings himself to death — just for the pure pleasure of stinging.



Towers

—and other low level obstructions

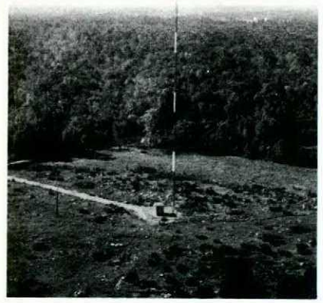
Capt T.H. Dunn
450 Sqn

The helicopter was on a low altitude night cross-country mission. The horizon was well defined but slant range visibility was poor due to the darkness of the night. Winds were forecast to be "on the nose" at two to four thousand feet so the crew elected to fly at 500–1000 feet AGL in order to benefit from the lighter winds near the surface. The aircraft track corresponded with the centre line of an IFR airway and at a point en route an object appeared immediately below the aircraft. The radar altimeter indicated 900 feet AGL. So, noting the track and DME of the object, the crew proceeded to destination and determined to return the following day and investigate the cause of their momentary coronary attack. A daylight investigation revealed a tower, 800' + to be the object in question. This tower was neither lit, marked on VFR or IFR charts, nor listed in Notams. The crew immediately notified MOT of the obstruction and filed an incident report.

While investigating this occurrence for the supplementary report the FSO uncovered several facts that may not be generally known to those who fly regularly in the lower altitude structure. The reference for this article is a MOT publication *"Criteria for Assessment of Objects Affecting Navigable Airspace"*. This publication outlines the policy that establishes the criteria to be used in assessing applications for the erection of radio and television towers which may be classified as hazards to air navigation.

This reference states in part:

2.1 It is recognized that a conflict of interest exists between the radio and aviation industries concerning the use of the airspace. It is nevertheless the responsibility of the Civil Aviation Branch of the Department of Transport to ensure the safety of all aircraft operations. In this regard it is recognized that aircraft operators who fly at altitudes of less than 1000 feet above terrain must accept the added risk of an obstruction existing in the same airspace and therefore such operators must take additional precautions.



2.2 It is the objective of the Civil Aviation Branch to ensure that, insofaras practicable, a limit of 1000 feet above the surface of the site be placed on all radio and television towers except in special circumstances where a Civil Aviation study will be required to determine if a higher limit would be acceptable.

2.5 Any application for the erection of a tower 500 feet, or less, above the surface at its site shall be processed and final assessment made at regional level. Any application for the erection of the tower in excess of 500 feet above the surface at its site shall be examined at regional level and thereafter referred to Headquarters together with the regional recommendation, for final assessment.

Once a tower has been authorized, constructed, and put into operation, MOT is made aware of the tower and action is taken to make aviators aware of the obstruction. This is done initially by placing the tower's location and height in the Notam section of the *nearest Air Radio station.* Follow-up action is then taken to ensure that the tower appears in appropriate maps and charts. The most dangerous period therefore is during the construction phase of these towers. Since 1967, some 500 towers have been authorized – yet have not been constructed. MOT *should* be informed when construction begins, but this is not always the case. In addition, there are at present no regulations governing the lighting to be used on towers under construction. It is therefore quite possible to have an unlit tower under construction at a location unknown to MOT and therefore unknown to aviators. Such was the case in the incident cited at the beginning of this article.

Low level fliers should take the following precautions to avoid any unwanted encounters:

- A careful scrutiny of the maps and charts for the route to be flown is most necessary for the *initial* flight planning.
- Check the Notams. Not only for the departure and destination aerodromes but for *all* en route air radio stations.
- Fly at an altitude you know will give you clearance from objects you may encounter en route. (MOT considers no tower acceptable if it should penetrate an imaginary surface commencing 1000' below the MEA or MOCA [whichever is lower]). Therefore aviators can rest assured that using these altitudes on *designated airways or air routes* will assure sufficient clearance from ground obstacles. Off designated airways or air routes, as previously mentioned, flights of at least 1000' AGL give an added margin of safety although never eliminating the requirement for a constant lookout. At night or when the visibility is restricted such as in daytime haze, smoke or snow, you should consider flying at least 1000' AGL and quite frankly, the higher the better.

Facts on Fatigue

Chronic fatigue is an accumulated weariness that is not relieved by a night's sleep or a short rest.

Symptoms: If you

- Frequently wake up feeling exhausted, stale, irritable
- Are very impatient over trivial things
- Have poor appetite, and food is tasteless
- Feel sluggish and unexacting in flying
- Are sleepy often during the day
- Feel like you couldn't care less

Action: You Should

- See the flight surgeon
- Take leave
- Get a change of scenery
- Rearrange your living habits

Chronic Fatigue is Serious. It has no place in a cockpit. Temporary (acute) fatigue is also a cockpit killer. Susceptibility can be reduced by living some common-sense rules:

Build Fatigue Resistance Through

- Regular exercise
- Regular, nutritious eating habits
- Adequate sleep at regular hours
- Ample liquid intake (not tea or coffee)
- Stimulating leisure activities

Fatigue is a Dangerous Crewmate. **AIRSCOOP**

Get a Grip

-but don't hang on!

Old timers will remember the tragic stories of T-bird drivers making a successful ejection and then riding the seat into the ground because they could not release their grip on the seat handle – the much publicized Death Grip. We have come a long way since then but that adrenalin-reinforced grip could still be causing problems in the ejection sequence.

Man/seat separators (buttsnappers) have eliminated the possibility of riding the seat into the ground as a result of the death-grip by providing enough separation to achieve chute deployment. However, the buttsnapper isn't always strong enough to break that determined grip on the seat handles. The prospects of leaving the aircraft at a place other than the flight line is enough to make one's grip on the handles decidedly firm, to say the least.

What happens when the buttsnapper says "go" but the man is unable to let go of that last semblance of security – the ejection seat? Here we must speculate to a great degree. A review of the ejection reports indicates that few people are able to describe the time interval between the ride up the rails and the instant that the chute deploys. Some examples will show that our concern is justified. From the statement of a Tutor pilot:

> ". . . . . .almost immediately after I went out the chute opened. I looked up, the chute was wide open, but the seat was right in front of me with one ejection handle tangled with one shroud line. . . . . I grabbed my knife and cut the shroud line. . . . . ."

From another investigation:

> ". . . . . .it is our hypothesis that on ejection, the pilot held onto the ejection seat handles. Upon buttsnapper actuation the stronger left hand retained its grip on the left handle whereas the weaker right hand was forced off the right handle with the ensuing loss of the right glove. Subsequently a part of the seat struck the helmet producing a stunning blow. The seat also made contact with the flying suit and parachute assembly".
>
> *(Ed: the blow to the helmet would have been severe enough to cause serious injury if the head had been unprotected).*

Some of our aircraft (the CF104 from 1966 and the CF100) have systems that release the ejection seat handle from the seat. In 116 ejections from these aircraft there are only two cases of interference (both in the CF100). In both cases the interference was caused by mechanical failure, not the "death grip" phenomenon.

In the aircraft without automatic separation of the seat handles (CF5, T33, Tutor, CF101 and CF104 before 1966) the picture is not as bright: in 146 ejections there were 15 cases of man/parachute and seat interference that could not be explained by mechanical failures.

While we lack direct evidence that "death grip" is still a problem, the circumstantial evidence strongly supports that conclusion. The problem may even become worse. Here's why: in the past we were encouraged to "beat the system" i.e., try to open the lap belt manually. We practised this procedure in our drills and were mentally ready to *release the handgrips* and open the lap belt. No one could try to "beat the system" and still retain a two-handed grip on the seat handles. Now "beat the system" is no longer recommended because if you are successful you will negate the automatic opening feature of the parachute. Thus you must mentally condition yourself to ease up on your grip after you've pulled the handles. Don't let go completely because you could become a victim of arm flailing. Help the buttsnapper do its job by pushing away from the seat if at all possible.

We have looked into ways of disconnecting the seat handles during the ejection sequence but these systems can best be described as "a plumber's nightmare". The concern is that they will cause other major problems in an attempt to cure the interference problems. Other technical fixes will be looked at closely but we must be cautious in changing ejection systems that are performing to near perfection. Since 1970 we have had 46 ejections. Only two were unsuccessful but both were attempted outside the envelope of the system.

At the moment only you can help yourself avoid man/parachute vs seat interference by being mentally prepared to help the separation sequence.

CHINOOK!

—noisy? ugly? or just big and beautiful?

Capt J.D. Hunter
450 Sqn

By the end of October '74 the Canadian Armed Forces, specifically 450 (T) Helicopter Squadron in Ottawa and Edmonton, will have taken delivery of the first of its new medium transport helicopters, the Boeing Vertol CH147 Chinook which will replace the CH113A Voyageur.

The history of the Chinook dates back to 1958 when the U.S. Army first requested bids for a medium transport helicopter. The bid was awarded to the Vertol division of the Boeing Company and by 1961 the first Chinook was flying. Since then the aircraft has undergone a considerable evolution from the first basic "A" model to the Canadian "C" model – the most advanced ever built. The evolution included extensive combat service in Southeast Asia.

Being the culmination of almost fifteen years of development, the Canadian "C" model is an impressive helicopter. Powered by two 3750 shaft horsepower engines it will have a maximum gross weight of 50,000 pounds as opposed to the 33,000 pound maximum gross weight and 2650 shaft horsepower engines of the "A" model and the 21,400 pound maximum gross weight and 1250 shaft horsepower engines of the Voyageur. This power performance combined with an automatic flight control system and a cruise guide indicator, which provides the pilot with a continuous indication of his rotor load status, as well as a projected top speed of over 170 knots, make the Chinook an eminently suitable aircraft to fulfill 450 Squadron's primary roles of logistical and tactical transport. The Chinook has the ability to transport forty-four fully equipped troops a distance of approximately 370 nautical miles. At maximum internal load and maximum internal fuel this figure is reduced to a still impressive 290 nautical miles. With a ferry range fuel system installed the aircraft will have a non-stop range of 1000 nautical miles. Other uses of the ferry range system include refuelling of other aircraft on the ground or replenishing bulk fuel storage tanks in the field. The cargo hook has a rating of 28,000 pounds which gives the Chinook the ability to lift with ease almost any vehicle or artillery piece used by the land element including an armoured personnel carrier which weighs in at 23,250 pounds.

Besides the logistical and tactical transport roles, which include the support and supply of ground troops in the battle zone, the logistical support of government agencies in the Arctic and the tactical movement of troops, artillery pieces, mortars, etc., 450 Squadron also has an important secondary Search and Rescue role. Here again the Chinook is expected to fill the bill admirably. Its high cruising speed will allow faster deployment to search areas and its greater range will allow longer searches for missing aircraft or persons. The helicopter is fitted with a rescue hoist of 600 pound capacity and the cargo hoist may be rigged to a rescue mode with the same capacity. The roomy cabin area can be converted to carry 24 patients in pole type litters in any medevac situation that may arise.

The above are just a few of the Chinook's advantages and capabilities. It also has an amphibious capability that rates it to sea state three with rotors turning and sea state two with rotors shut down. The aft cargo ramp may be lowered during amphibious operations with a water dam installed and the aircraft can be ski equipped for soft snow operations.

With all these advances and advantages, however, the flight safety aspect of the Chinook cannot be overlooked or overstressed. The sheer size and weight of the aircraft present hazards to operator and users alike. The downwash from the sixty foot diameter rotors is tremendous and the size will entail much more planning and caution in all phases of operation especially in crowded airports and confined areas. The ever present danger of the rotors on helicopters is no exception on the Chinook. When turning, the front rotor will be only ten feet eleven inches from the ground with the ability to droop to well within the height of a man. These and other factors must be constantly kept in mind for successful accident free operation.

This then is the Chinook, Canada's latest military aircraft acquisition and one which is expected to more than fulfill any challenges or expectations.

BREAK-OFF

—a form of disorientation

Maj R.C. Rud
Base Surgeon
CFB Portage

When aircrew think of disorientation, the picture which springs to mind is one of a pilot in, or recovering from, non-level flight, experiencing dizziness and unable to believe the attitude which his instruments indicate to him. Under such circumstances the correction is simply – believe those instruments and get on the dials.

However, all episodes of "disorientation" are not so clear cut. The following is quoted from a case presented to the RAF Institute of Aviation Medicine and is reported by A.J. Benson in the *Journal of Aerospace Medicine*, August 1973:

> This pilot presented with a two year history of episodic feelings of unreality and detachment when flying at high altitude. He had no symptoms until he had to carry out calibration flights in the Canberra (B2) which entailed flying at a height of approximately 40,000 ft on a constant heading for a 30-60 mins period. When the horizon was indistinct and the ground obscured by cloud or featureless, as when flying over the sea, he was on occasions overcome by a 'feeling of unreality' and remoteness from the aircraft. These sensations were accompanied by apprehension and a fear that he might lose consciousness and control of the aircraft. However, he was always able to maintain full control and there was no change in his appreciation of aircraft orientation. Anxiety was also manifest as muscular tension and sweating.
>
> Symptoms commonly continued for as long as he had to fly straight and level on fixed heading and had been experienced for 90 mins on occasions, though 30 mins was more typical. Symptoms disappeared as soon as a well – defined external visual reference was available, or conversely when he flew into cloud and had to fly solely by instruments. Any distraction, such as talking to his navigator or alteration of flight path, could alleviate symptoms, though only when such an event occurred spontaneously. Volitional attempts by him to redirect his attention rarely modified his symptoms.
>
> Over the two year period, he had experienced such perceptual disturbances on about 20 occasions. He sought medical advice because of increasing severity of symptoms in flight and the development of anticipatory tension a day or two before a flight in which he thought symptoms would occur.

The preceding case was one of a series of 78 cases of "disorientation in flight" reviewed by Benson. Of the cases reviewed, 29 pilots described incidents in which they experience strong feelings of unreality and detachment. These cases represent a sample of an increasingly reported phenomenon known as "break-off".

This phenomenon is not limited to fixed wing or jet aircrew. The following is a case report from Dr. Benson involving a helicopter pilot:

> A helicopter pilot with over 3,000 flying hrs experience frequently made service flights to offshore drilling rigs in the Persian Gulf. On one such flight similar to those which he had made many times before during the preceding 3 yrs, he had climbed to 500 ft and set course for the offshore rig; the horizon was poorly defined because of haze and the sea below was calm and nearly featureless. After flying for about 10 mins at constant heading and altitude, he suddenly experienced a 'light-headed feeling', and that he was 'out of touch' with his immediate environment. He became more aware than usual of small movements of the helicopter but there was no qualitatively false perception of its orientation. No other symptoms characteristic of hyperventilation were experienced, though he became tense and tended to overcontrol. The derealisation and other symptoms persisted until he saw the offshore rig and began to descend. Because of this unusual sensory experience he returned to the mainland with a co-pilot and had no symptoms.
>
> He had no further trouble for five months when, in circumstances essentially identical to the first incident, he again had feelings of unreality. On this occasion he became more apprehensive and felt that he would be unable to cope with an emergency should one arise. Symptoms disappeared on landing, though he still felt somewhat ill at ease. During the subsequent two days he made five flights, each more disturbing than the preceding one. By this time he was agitated and seriously doubted his ability to fly with safety, so he reported the incidents to his Medical Officer.

The writer of this article is well aware of the phenomenon, having experienced it many times during his flying career; and therefore feels that aircrew should be aware of the condition and encouraged to report it to their flight surgeon should it occur.

In summary, the symptoms of the break-off phenomenon are:

- a general altered awareness of one's relationship to the aircraft or to the earth's surface;
- a feeling of detachment or isolation, particularly on high altitude flights;
- apprehension and fear of losing consciousness or losing control of the aircraft;
- dizziness or "light-headedness" may be combined with the above symptoms.

It has become clear that attempting to live with symptoms such as those above can be very emotionally taxing and can lead to severe anxiety-neurosis. It is emphasized that the break-off phenomenon is relatively common and that understanding it can eliminate it or at least relieve the anxiety which may be produced. Aircrew who experience these symptoms are highly encouraged to report them to their Flight Surgeon.

Winds of Change

...are you ready to get knotted?

Maj R.L. Jones
NDHQ/D Met Oc

It had been originally intended to entitle this article "It's In the Wind", but as you read on you will find that the subject covers a bit more than breezy topics.

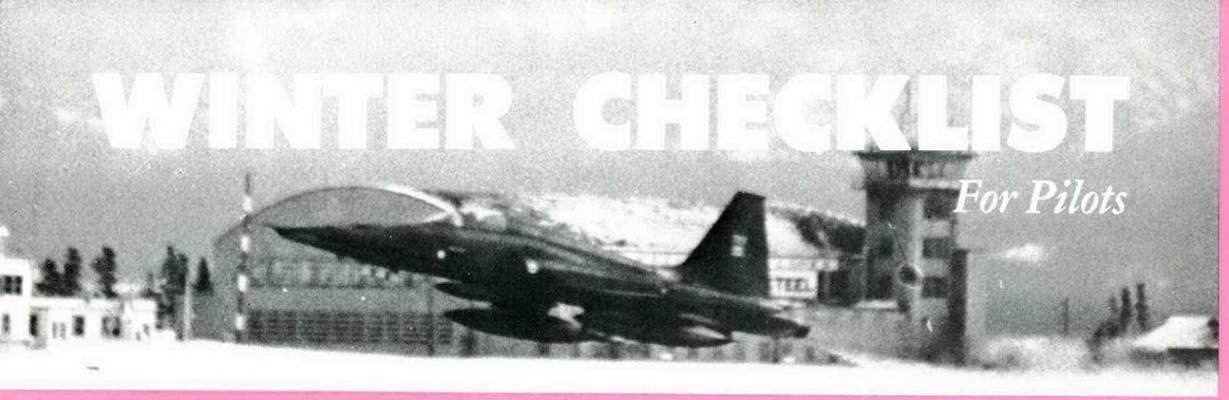
But what about the wind? As you know, the wind speeds in Canada are reported in m.p.h. (statute miles per hour). However, on or about 01 December 1974 all meteorological offices in Canada will begin reporting these speeds in "knots" (nautical miles per hour). Why? The knot is officially blessed and used by all I.C.A.O. members as the standard wind speed unit for meteorological, marine and aviation use. Canada remains the last nation in the Western World to effect this change. Why did we not convert earlier? Because, in anticipating conversion to metric units, we had hoped to be able to go through this exercise only once; that is, convert directly from m.p.h. to, say, kilometres per hour. However, a developing trend toward world-wide preference for the knot, even after metric conversion of other units had taken place, has given us reason to conclude that this is the right course of action.

Our first priority for "K" day, 01 December 1974 is to effect a recalibration of all the U2A wind indicators at ATC facilities from which information is relayed directly to aircraft (over 300 at civilian and DND airfields). This priority will ensure that accurate direct readout wind information in knots will be given to all aviation users on and after "K" day. Other wind indicators not directly involved with aviation such as those used in weather offices will initially remain in m.p.h. Conversion tables will then be used to obtain knots from these indicators with the resultant values in knots being entered in hourly weather reports and given to the public and marine interests as required.

How will the introduction of "knots" affect our daily work routine? For you in the aviation field the effect will be minimal, (after all 1 knot is approximately equal to 1.15 m.p.h.). For those in the weather business, the main difficulty will occur in the archiving of the wind data in the new units, but that's our problem. The advantage in such a conversion is to conform with surface wind reporting procedures in use throughout the world. The winds at upper levels and in marine areas are already reported in knots. So keep ***01 December of this year*** as a date to remember for this important change.

Speaking of changes there are two other forthcoming important conversions in weather information. By now everyone is beginning to hear more and more about ***metric conversion.*** A working group on metric conversion, as it applies to meteorological matters, has established two dates which everyone should take note of now.

On ***01 April 1975*** all Canadian meteorological offices will begin reporting temperatures in public forecasts and current reports in metric units of ***degrees Celsius.*** Five months later, (after we've absorbed this initial change), on ***01 September 1975*** precipitation will be specified in millimetres for rain and centimetres for snow in all "met" communications to the user. Planning for conversion of the remaining meteorological units is proceeding but no definite dates on this have yet been established. The present trend indicates visibility and RVR will be converted to metres. However ceilings and altimeter settings may remain in English units of feet and inches respectively for some time afterward. You will be informed from various sources as these events develop.



WINTER CHECKLIST

For Pilots

PREPARATION

1. Keep physically fit.
2. Wear proper clothing.
3. See the flight surgeon when you have a cold. Don't self-medicate.

PLANNING

1. Check the freezing level, cloud types, degree of icing and the dew point for the possibility of fog formation.
2. Be sure weather is within your limitations.
3. Check the status of taxiways, runways, navigation and landing aids at departure, destination and diversion airfields.
4. Supervisors, be sure the crew's capability is equal to the weather.
5. Know the all-weather information contained in the flight manual.

PREFLIGHT

1. Although it's cold, don't make the walkaround a race-around. Pay special attention to pitot heads, static ports, control surfaces, intake ducts and gear wells.
2. Be sure the aircraft is completely de-iced.
3. Carefully inspect for fuel and hydraulic leaks caused by the contraction of fittings or shrinkage of packings.
4. Closely inspect drain lines and vents for ice or snow. Be sure pneumatic bottles have been adequately serviced.
5. Check that windshields and canopies are frost-free and clean inside and out.
6. Be sure to check the pitot heating, anti-icing or de-icing systems prior to taxi.

TAXIING

1. Where possible, have the aircraft moved off ice before starting.
2. Avoid blowing snow, ice or slush onto ground crew personnel or equipment.
3. Taxi slowly – the slower the better. Allow more room for turning and stopping.
4. Increase space between aircraft to avoid slush or ice being blown onto your air machine and to ensure adequate stopping distance.
5. Be sure all instruments are warmed up and check for sluggish instruments during taxi.
6. Painted areas on runways, taxiways and ramps are slicker than unpainted areas, especially when wet.

TAKEOFF

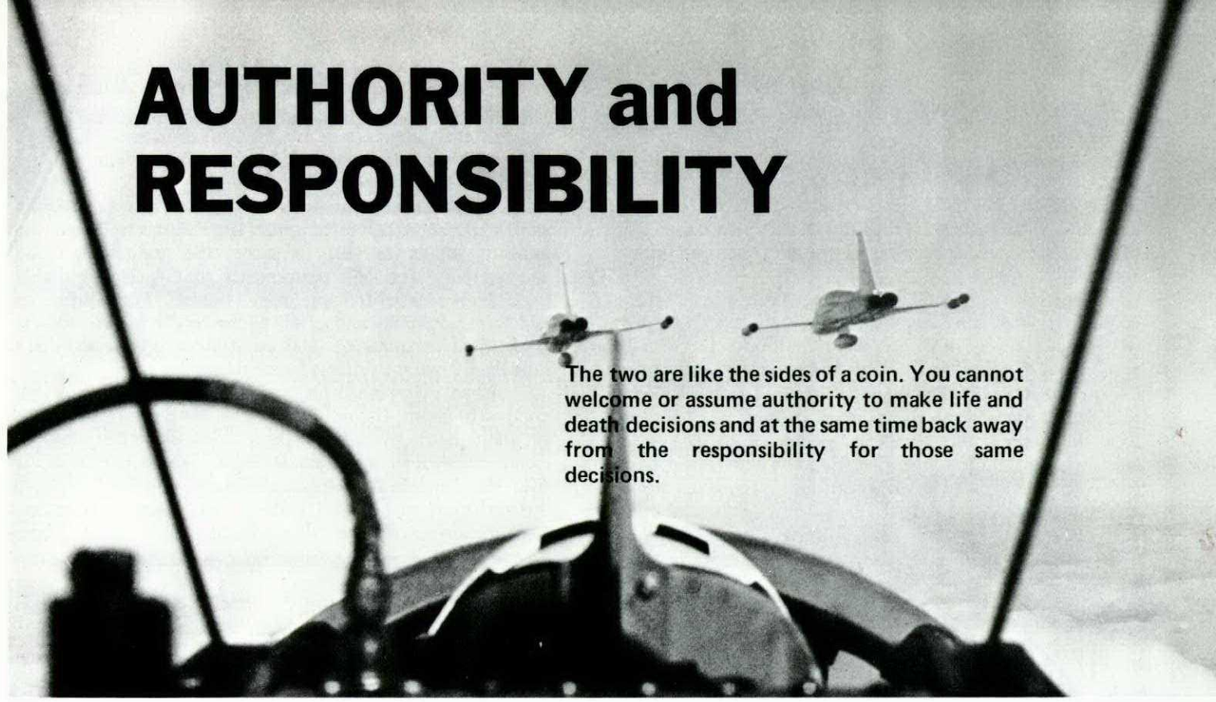
1. Double-check the crosswind component as you take the active.
2. Line up on a dry spot – if one is available. Beware of slip on runup. Brakes may not be adequate to complete the full mil runup, so be ready to finish the checks during the first part of the takeoff roll.
3. Ensure that the pitot heat is on and that you have selected the correct setting for cockpit and canopy heating.
4. High-speed aborts on runways covered with snow or slush may cause a flameout from precipitation ingestion.
5. After takeoff from a snow or slush-covered runway, recycle the landing gear several times – if the procedure is recommended by the flight manual.

IN FLIGHT

1. Avoid areas of icing or strong turbulence whenever possible.
2. If you have to fly in icing conditions, use the anti-icing system early to prevent a large buildup of ice.
3. Operate windshield and canopy heating systems at the highest temperature possible – but one consistent with pilot comfort – to prevent frost or fog formation during descent.
4. Keep ahead of the weather. Maintain a constant weather watch of conditions at your destination and divert airfields.
5. Know the capabilities and limitations of the radar station you are working with.
6. Plan ahead and stay ahead.
7. Pass on PIREPS.

LANDING

1. Plan descent to expedite passing through icing levels.
2. Carefully evaluate landing conditions – crosswind, landing surface and visibility.
3. Fly an on-speed approach. That little extra speed adds up to extra runway.
4. Touch down firmly in the centre of the runway and without drift – remember the stripes on a runway are the slickest.
5. Beware of patchy surface conditions that can cause uneven braking and directional problems.
6. On exceptionally slick surfaces use all forms of braking if necessary – aerodynamic, anti-skid, drag chutes.
7. Don't be hesitant about diverting or going around.
8. Taxi-back after landing is often trickier than going out for takeoff. With the same thrust, your aircraft with a now-lower gross weight will taxi faster, and you may have to ride the brakes more or shut down an engine if you have more than one.
9. Don't relax until you are safely in the chocks.
10. Pass by or call the weatherman and tell him what kind of conditions you encountered.



AUTHORITY and RESPONSIBILITY

The two are like the sides of a coin. You cannot welcome or assume authority to make life and death decisions and at the same time back away from the responsibility for those same decisions.

It hasn't been many years since the image of an aviator was one of an intrepid, scarf-in-the-wind individual who thrived on danger. He was measured by his valorous spirit and by his willingness to demonstrate complete lack of fear. There was never a bridge with span so small he could not fly under it, nor a cow so slow he would not chase it. Among his colleagues and him there was never a dare too extreme nor a wager too meagre to gamble for. To win a drink of bourbon he would gamble with his life – many times he lost and died. But even in death his hero image lived on. Ballads were written of his exploits and toasts were made in esteemed remembrance. It made little difference whether his death resulted from an act of heroism or a vain attempt to prove the impossible. He was a member of an elite (and forgiving) group. His era has passed.

We've come a long way in establishing the impression that today's Air Force pilot is a mature, thoroughly capable and reliable individual – the type of professional our fellow citizens can feel secure in trusting with their lives. But we are handicapped in these efforts by an occasional blunder by one of our own. Each year there have been instances where our pilots ignored all the training and education that had been pumped into them and deliberately went beyond their own and their aircraft's limits. Some gave in to temptation and attempted manoeuvres that could only end in disaster, others buzzed their friends or their wives. Their shows were as spectacular as they were heartbreaking for the spectators.

Since Lincoln Beachey pioneered low-level acrobatics years ago, hundreds of airmen have proven they can fly acrobatics safely if they are proficient. Hundreds of others have proven that acrobatics are deadly for those who are not proficient. Accidents due to acrobatics are, fortunately, rare in today's Air Force.

As a group, most pilots feel they are capable of handling any manoeuvre at any altitude. The very nature of their profession requires this confidence, for without an aggressive outlook our combat capability would be seriously degraded. And every squadron must feel that it has the very best of pilots – heaven help him who admits he might be the weak link in the chain.

We expect our pilots to know their airplanes, systems, procedures, and themselves well enough to cope with any manoeuvre that may be required in the conduct of their mission. This is as it must be. However, low-level acrobatics and thrill seeking deviations from mission briefings cannot be condoned if we are to maintain our professional stature. Accident records have proven, time and time again, that spur-of-the-moment skill testing of one another's ability or impulsive exhibitions of airmanship close to the ground often end in disaster. In the majority of such cases, the pilots involved only proved their foolhardiness.

In an accident in another command involving two aircraft attempting a low-level manoeuvre (barrel roll), the second aircraft dished out and struck the ground, killing the pilot. The manoeuvre was not necessary to mission accomplishment nor was it briefed prior to flight. Here are a few excerpts taken from the analysis portion of the investigation:

". . . . . Since men have flown airplanes, they have proven their prowess by performing dangerous manoeuvres at low altitude. Both the capability and willingness to perform these manoeuvres have been equated to the essential traits of the fighter pilot: courage, skill and aggressiveness. The unwillingness to perform these manoeuvres, the suppression through disciplinary action of those who do perform them and the rigid enforcement of regulations restricting such manoeuvres have been equated to an overcautious, nonaggressive, old-womanish attitude. Therefore, the pilot is subjected to a very powerful form of social pressure. He violates flying regulations to maintain the aggressive image that is most acceptable to the group with whom he works and lives . . . . . The fact that we have lost hundreds of aircraft (and airmen) to accidents of this nature bears witness to the impact of this form of pressure. Furthermore, repeated emphasis on enforcement of valid regulations, emphasis on aircrew professionalism and emphasis on flying safety has failed to halt accidents of this type. The

irony of this situation is that accidents involving intentional violations of flying safety regulations are perhaps the most preventable type of aircraft accidents. Aggressiveness, when directed toward mission accomplishment, is an essential trait in any Air Force officer . . . . . we cannot afford to lose this quality in our pilots. However, the term aggressiveness cannot be condoned as rationalization for irresponsible conduct, violation of regulations and failure to accept the responsibilities of command".

What do we mean by accepting the responsibilities of command? When the canopy is down and the wheels are in the well, the pilot carries an almost absolute authority. But with that authority also comes an awesome responsibility. The two are like the sides of a coin. You cannot welcome or assume authority to make life and death decisions and at the same time back away from the responsibility for those same decisions. The two go hand in hand – it cannot be otherwise. The pilot is accountable for the conduct of the mission. This means following the best established procedures and carrying out every phase of the flight as your commander expects you to do. Each time we launch on a mission, we should carry the awareness of this authority and responsibility foremost in our thoughts. Performing reckless, chance-taking manoeuvres at low altitude is definitely not characteristic of a responsible attitude.

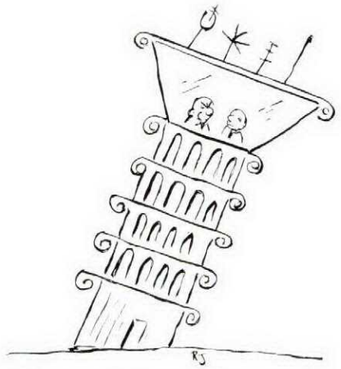
When a man accepts and wears pilot's wings, he possesses skills and qualities that set him apart from other men. Those who are not willing or able to accept the responsibility and accountability for their performance in the cockpit should aggressively seek other employment. The only other choice is an end to responsibility and an end to the confidence and trust in those who wear our wings. Men can never trust those who don't hold themselves accountable for what they do.

When you pinned on your wings you joined a proud, competent group. The rewards are great and we enjoy one of the proudest heritages in any professions. But the price of membership is high, the demands are great. There is no room for the reckless and the foolhardy among the pros.

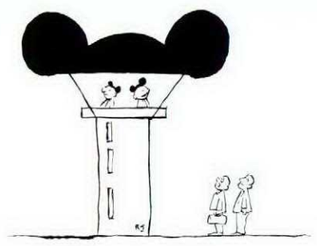
courtesy of AIRSCOOP

Controller Capers

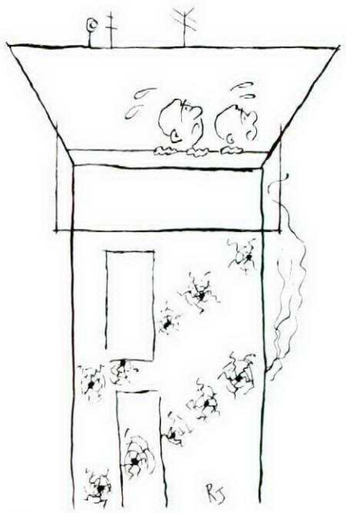
Cartoons courtesy CATCA Journal and Bob Randall, Vancouver.



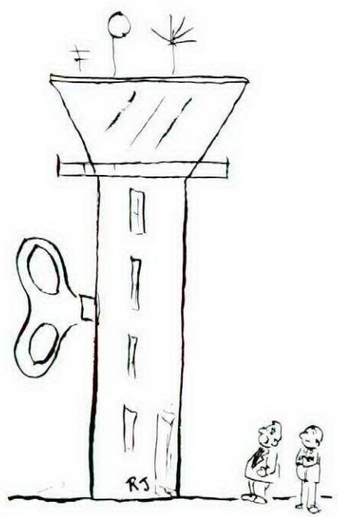
"Never work in an Italian control tower".



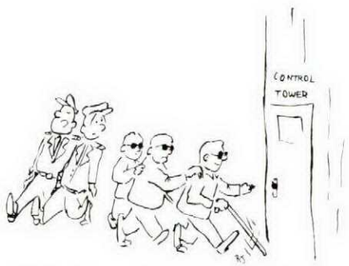
"I don't think I'm going to like working here".



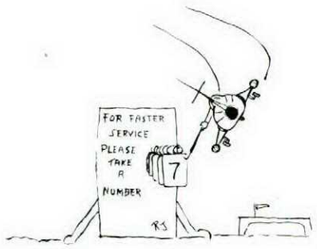
"That's the last time I overshoot a Voodoo".



"So much for automation".



"Relax, they do that in front of all new pilots".



On the Dials

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

Missed Approach Procedures

It has come to the notice of the ICP staff, both through candidates on course and through field trips that there is a great deal of variance and misunderstanding on the subject of missed approaches – particularly during simulated IFR flights. Because of this, a few points should be stressed to all pilots in the field. The majority of errors noted have been made by those pilots who were positive that they were doing the right thing.

First question: When is a missed approach part of approach landing?
Answer: ***Always*** – See CFP 148 – 3304 (3)
Second question: What procedure is to be followed?
Answer: Plan to execute the missed approach, as published on the approach chart, or as given by the controlling agency. See CFP 148 – 3304 (3)

Now this is where the confusion prevails and the improper procedures show up. The part "as given by the controlling agency" is being misinterpreted and misused in a lot of cases.

Unless the controller gives a definite instruction i.e., "Immediate left turn" or something other than is published on the approach plate you must fly the missed approach as published in order to ensure safe terrain clearance.

"On missed approach cleared to Portage via V304 Delta direct, maintain three thousand" gives you your route. "On missed approach" or "when able" means that after you have completed the missed approach as published – you will proceed via this route. True, it looks as though it would be easier to just turn left from the NDB missed approach point and proceed en route, but you have no obstacle clearance coverage for this procedure. The missed approach is designed around GPH 209 – Manual of Criteria for Instrument Approach Procedures and obstacle clearances are for a defined area around the missed approach track only. If you don't believe that – ask your ICP. Once you have reached your sector altitudes you may proceed on course as you now have safety coverage of 1000 ft above all obstacles.

In this instance, Air Traffic Control does not have the responsibility for providing obstacle clearance. This is still the pilot's responsibility – and don't you forget it.

–helping ourselves to help others

Capt R.W. Eby
UFSO, VP405 Squadron
CFB Greenwood

If the crews on your unit were diverted, while airborne, to a Search and Rescue (SAR) mission, or if they were asked on short notice to provide a thirty minute airshow for a nearby community, would they be able to effectively and safely carry out the assigned task?

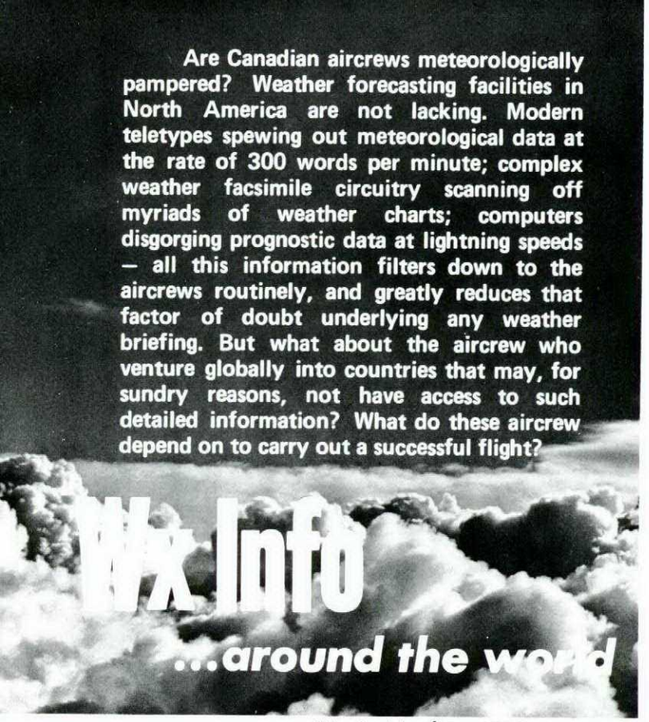
The role of the survivor in a SAR situation is well known to all of us; our Land, Sea, and Arctic Survival Schools see to that. But how many of us, other than those on SAR units, are knowledgeable enough to:

- Send a concise, accurate Notification of Crash Location (NOCL) message
- Fulfill the requirements of crash scene photography
- Provide navigational and flight following assistance to fixed wing aircraft and helicopters
- Initiate and implement one of the standard search plans as laid down in CFP 209 and the Searchmasters Handbook
- Communicate with or without radios with surface craft or survivors at a crash site
- Brief lookouts on correct scanning and intercom reporting procedures
- Use information on track spacing, visibility distances and heights to best advantage
- Utilize or adapt for use equipment on our aircraft in an electronic search?

All this information and much more will be provided during an organized search as a "Pre-Search Briefing". If, however, you are diverted to search while airborne, this will not be available to you. To correct this situation, a precis of essential information should be prepared for all crews, and placed permanently in all base aircraft. Copies should be sent to Command Headquarters and to the other operating units. If a precis of this sort would benefit your unit, all the required information is readily available from CFP 209, *The Searchmasters Handbook*, and a short visit to the nearest SAR unit or RCC. Help your personnel to help others!

The other question asked at the beginning of this article concerns airshows or flypasts. How often are we asked on short notice to provide an aircraft for a short informal airshow? It happens all summer long. To assist squadron crews, suggested routines for these airshows should be prepared, giving airspeeds, altitudes and sequences that meet the requirements of a well presented demonstration and also conform to the relevant CFAOs. This outline should be held in squadron Standards and Operations sections to provide the information to crews requiring it. It is intended only as a guide, but should allow this type of mission to be prepared with a greater emphasis on flight safety.

Information on SAR and airshows is provided to enable VP405's crews to complete these tasks safely and effectively. Could your aircrew use information such as this for any of their seldom flown or non-standard missions?



Mr A. Mathus CFB Trenton

There is a tremendous variation in international weather services. Those aerodromes where the major powers e.g., the United States, have large detachments, provide a most elaborate weather service. There are countries, however, that for many reasons have the capability of only providing mediocre services. The problems may be attributed to financial instability and lack of skilled staff, just to mention two factors. Prognostic information may not be as accurate or may end abruptly at the country's borders. The latter, in part, is prompted by the lack of a communications system to link up internationally with other countries. In addition, the low number of flights scheduled out of some aerodromes may not warrant maintaining complete forecast coverage or staff. These are some of the problems which plague flights into these types of countries. Let's cite some actual examples encountered by aircrew in Air Transport Command.

Refuelling stops are often made in Accra, Ghana, below the "hump" in western Africa. For a flight westbound, the meteorological documentation received here ends abruptly at the western fringe of Africa. Notwithstanding the fact that some 3000 miles of ocean must be crossed before land is sighted in the West Indies, there is simply no weather information available at Accra for that portion of the Atlantic Ocean.

Now let's concentrate on one particular flight from Air Transport Command, just to indicate what was encountered on this five day mission. The itinerary read: Trenton to Antigua (West Indies) to Recife (Brazil) to Ascension Island to Las Palmas (Canary Islands) back to Trenton.

On arrival at Antigua, a weather briefing was laid on for the following morning. Next morning – nothing! Whether the briefing reservation was misplaced or not, the aircrew were informed that there was little information available routinely for the anticipated flight to Recife, much past the northern portion of South America anyway. In effect a briefing would only have been available for about half the distance.

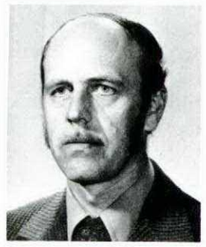
At Recife no personal contact was made with the weather office. Instead the documentation was provided as a courtesy by a dispatcher for Varig airlines in Brazil. Incidentally, he also acted as an interpreter for the crew. Included in the documentation were high level charts and forecasts for a flight anywhere in South America. The charts ended abruptly about 100 miles offshore: Ascension Island lay a further 1200 miles to the east. When questioned, the dispatcher admitted that the low frequency of flights in that general direction did not warrant maintaining a continuous prognostic display. Hence, no data!

The Americans maintain an impressive array of satellite tracking machinery on Ascension Island, together with elaborate communications facilities. No weather office exists at this aerodrome. Prior to departure for the Canary Islands, the aircraft commander received a thorough briefing via a telephone link to the USAF Global Weather Centre in Offutt Nebraska, over a distance of some 6500 miles. This call was completed in a matter of minutes – a fantastic contrast in briefing facilities over the previous two days.

At Las Palmas, the aircraft was ramped on the Spanish Air Force side of the aerodrome. A complete folder of terminal forecasts and en route forecast conditions was awaiting the crew at flight planning time. These were provided by a representative of the Spanish Air Force who had obtained this information from the weather office located elsewhere. Again, since no personal contact was made with any staff of the weather office the interpretation of the charts and forecasts fell on the shoulders of the aircrew.

Many other examples can be given. Every crew in Air Transport Command returning from global flights can quote stories concerning the availability or non-availability of weather data: It is a routine problem. Although there is a gradual strengthening of international meteorological bonds re: codes, symbols, etc., many problems are still encountered. Can these problems be completely solved? The answer is – no. But they can certainly be eased. Firstly, the aircrew should ensure that they have a good understanding of the international weather codes that are used routinely. Secondly, they should ensure that they are able to interpret high level prognostic charts correctly. Thirdly, in this day and age of computers, statistical data is available for many aerodromes around the world. Most Canadian Weather Offices have access to this data. One simply has to provide an itinerary to the meteorologist. He will then produce average conditions of temperature, precipitation, in flight winds and temperatures, zones of possible severe weather – just to mention a few items. This information is particularly adaptable for tropical flights where the weather changes are more gradual, and behave more according to seasonal patterns than to daily ones.

To the fliers, take advantage of this offer. It's free and may prevent some headaches en route.



ABOUT THE AUTHOR *Mr Mathus is presently the Chief Meteorological Instructor at 426 Transport and Training Squadron, CFB Trenton. Mr. Mathus was previously employed at the Atmospheric Environment Offices in Vancouver and Halifax and has also served at many CF flying bases.*

SNOW + JP4 = FIRE

This article was originally published in the Oct 1961 issue of *Combat Crew.* It was written by LCol C.J. Konoz, then Commander 905 Air Refuelling Sqn, Grand Forks AFB.

Hold it gents! Before you turn this page looking for a more hairy tale of woe, let me tell you about snow and ice that burn.

As we all know, each major change of season brings on a distinct set of air and ground hazards. Most of these hazards we are familiar with but occasionally we stumble onto a new one. More often than not, this new hazard is recognized after a serious accident or incident. During this past winter we discovered a serious condition that is probably prevalent at every base experiencing snow and, we fear, not widely recognized.

It all began with a routine early evening ground refuelling of a KC-135. About halfway through the refuelling a seal on the MD2 hose cart ruptured, allowing 30 to 35 gallons of JP4 to spill on the hardpacked snow on our ramp. The servicing crew followed the proper procedures and immediately shut off the pit pressure, notified the fire truck that was standing by, and alerted the command post. The aircraft was towed away, the area isolated and the fire truck washed down the spill with water.

At the time of this incident the temperature on the ramp was minus ten degrees F. Naturally the water, the hardpacked snow and the JP4 turned into a greasy slush. Within a short period of time the slush froze, with most of the JP4 remaining on top of the ice.

During the night a few inches of new snow fell. Next morning our wing safety officer decided to take another look at the area to be sure it was safe. From all appearances the fuel had dissipated, the new snow was unblemished, and the area was safe to use again.

The second morning, personnel working in the area around the pit detected a slight odour of JP4 although the temperature was still hovering around zero degrees F. It was noticed that the snow was greasy to the touch and packed very easily. After handling the snow the hands smelled strongly of fuel. A gimmick was rounded up that measures the explosive qualities of a gas – an explosiometer, and with the help of the fire department, took some readings of the air immediately above the snow. The instrument readings varied between 10 percent and 15 percent L.E.L. (lower explosive limit, as you undoubtedly know), which indicated an explosive hazard right at that moment.

To further verify the numbing truth that was dawning, our safety officer and fire chief gathered a pail full of snow and took it indoors to gradually warm it up. As the snow temperature was raised the explosiometer reading increased. When the mixture approximated half snow and half liquid, the reading was 48 percent L.E.L. The pail was then taken outdoors and flame applied to the slush. The fire that developed left no doubt that "snow" will burn. Another pail of snow was brought indoors and completely melted. About one-third of the liquid was JP4.

We realized that we had at least one parking spot that had a very short fuse. Needless to say, the isolation of this parking area was continued. A number of snow samples were then taken from the area that would have been under an aircraft had one occupied the spot. These samples were melted and the remaining liquid measured 22 percent to 31 percent pure JP4.

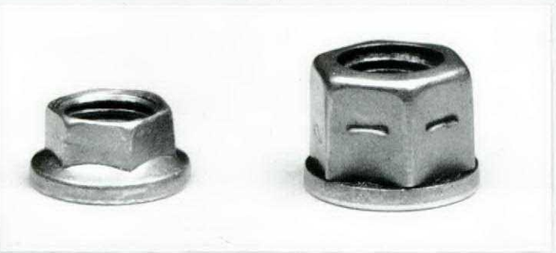
In reflecting back on the number of times we have seen ramp vehicles backfiring or idling for periods of time, ground powered equipment running for extended periods, snow plows throwing sparks as they grazed the concrete and, of course, the biggest heat generator of all – aircraft jet engines, we wondered just how close we might have been to launching a KC-135 not on the 60-9 schedule. We further realized that a fuel spill is not necessary to create a fire hazard under an aircraft, since each time we shut down a jet engine we dump the contents of the manifold overboard. True, not a great deal of fuel is dumped but after repeated shutdowns . . . . . In addition, we wondered how many other bases with climatic conditions similar to ours might not be aware of this potent danger that can develop so easily.

The lessons we learned from this experience were that with low temperatures, fuel dissipation is very slow, and that fuel "married" to snow is not immediately evident. But, most important, snow and ice-covered ramps frequently used for parking and refuelling aircraft must be carefully checked periodically to ensure that the most serious ground hazard of all – fire – is not waiting to happen.

So, what did we do to solve our problem? Fortune smiled on us and two unusually sunshiny days warmed the ramp and our "live bomb" dissipated normally. We returned to our routine tasks none the worse for wear but a heck of a lot smarter.

MIXED NUTS

Could you mistake the nut on the right for the one on the left? Someone did and installed an engine starter with six of them. The correct nuts (left) are self-locking but the others are not. Consequently they all backed off allowing the starter to come loose. Fortunately the problem was discovered during the DI before any damage had resulted.



FROM THE AIB

TUTOR, DOUBLE BAILOUT A pilot on Tutor jet refresher training at Moose Jaw took off on his final clearhood handling trip. After completing a series of exercises which included stalls, spins and aerobatics he relinquished control to the QFI in the right hand seat who then proceeded to do a number of aerobatic sequences.

On the pull up for a looping manoeuvre at approximately 6500 ft MSL, with 300 kts and 93 percent RPM, a distinct loss of thrust was felt. A cockpit check confirmed that the engine had flamed out. One relight was attempted while zooming to gain altitude but only 35 percent RPM was achieved. The crew established a glide towards base and attempted two more relights – both resulted in the engine hanging up at 35 percent. The pilots decided that they were unable to make the airfield and ejected at approximately 3000 ft AGL. They were picked up by rescue helicopter and returned to base having suffered only minor injuries during their escape.

The aircraft crashed in a relatively flat area and remained upright and virtually intact: there was no fire. It was determined from the aircraft condition and from photographs that the Tutor impacted in a near-stall (estimated 80 kts), left wing down with a nose-up attitude of 10-15 degrees. It then became airborne again, re-impacted in a slight nose-up attitude and skidded to a halt approximately 100 ft from the initial point of ground contact: the "landing area" was covered with two to four ft of compact snow. The aircraft was rigged and slung back to base by a CH113A helicopter from 450 Sqn Edmonton.

INVESTIGATION

Since the symptoms accompanying the initial flameout and subsequent RPM hang ups were indicative of a fuel systems malfunction, the complete engine was shipped to the manufacturer for investigation. The engine strip revealed nothing significant. Likewise, the instrumented test runs carried out on the suspect fuel systems components utilizing a slave engine revealed nothing untoward. Detailed functional testing and stripping of suspect items was then undertaken by the fuel component manufacturer and all parts except the overspeed governor (OSG) proved satisfactory.

The OSG failed to meet test requirements in that it changed intermittently into the bypass mode of operation without apparent cause. During the strip several discrepancies were revealed, the most significant of which were a substantially worn roll pin and a considerable amount of internal corrosion. Subsequent tests determined that the worn roll pin condition permitted the controlling pilot valve to act independently of its base and seek a position corresponding to an overspeed situation, thus forcing the fuel metering valve to adopt the bypass mode of operation. With the metering valve in the bypass position, and being held there by the frictional effect of the corrosion, the only fuel available to the engine would be a 400 pounds per hour (pph) flow through the OSG minimum fuel flow port. Significantly, 400 pph of fuel flow is required to sustain a J85 engine at approximately 35 percent rpm after a relight.

The following action has been taken to correct these technical deficiencies:

- the overhaul life of the OSG has been reduced from 1500 hours to 900 hours;
- to eliminate roll pin wear an improved straight nitrided pin is now included during component overhaul; and
- the corrosion found inside the OSG is the only known case to date and may have been the result of prolonged storage and inadequate inhibiting. An investigation of this problem is underway.

Although material failure was the cause of this accident the ejection sequence highlighted other problems. There was evidence of seat/parachute interference in the case of one of the pilots and AETE are presently conducting tests in this area. Studies by specialist agencies within NDHQ reveal that while failure to release handgrips during man/seat separation compounds interference problems other factors are also involved. AETE tests indicate, for example, that if the ejectee is slumped or improperly positioned prior to ejection, the seat/man trajectory, seat stability, and seat/man separation may be adversely affected. Conditions imposed by the relative drag to mass ratio on the seat and ejectee after initial separation also contribute to the problem. The introduction of a Ballistic Inertia Reel (BIR) into the Tutor escape system should help alleviate some of these problems.

CF5A The pilot of a CF5A was authorized to carry out a general aircraft handling mission and after completing an aerobatic sequence he initiated a high pitch attitude stall. Entry was made at 15,000 ft MSL, 480 KIAS and the aircraft was rotated into a 70 degree pitch attitude with 4 "g" and 97 percent power. As the speed decreased the 70 degree climb angle was maintained with full nose up pitch trim and full aft stick. At approximately 25,000 ft MSL the nose of the aircraft began to fall to the horizon with airspeed 60 knots or less. Full aft stick and nose up pitch trim was maintained. With the nose approximately 65 degrees above the horizon the left wing began to drop. The pilot attempted to correct with partial right aileron and one third right rudder pedal deflection. The left wing continued to drop to 45 degrees of bank and yaw commenced to the left. The pilot neutralized the controls at this time with the pitch trim remaining at full nose up. With the nose now approximately 45 degrees above the horizon the yaw to the left accelerated and the left wing started coming back to level flight. Near completion of the first rotation with the nose attitude stabilized at 5 to 10 degrees above the horizon the pilot initiated spin recovery i.e., full left aileron, full right rudder and as much aft stick as possible. The rotation continued and the aircraft stabilized into a non-oscillatory, steady and very smooth rotation to the left at 70 to 120 degrees per second. There was no evidence of negative "g" and the pilot was not subjected to any forward forces. He maintained continuous spin recovery control inputs for at least five rotations with no visible effect and finally ejected successfully at 8000 ft MSL. The aircraft impacted in nearly level flight with relatively low vertical velocity and zero forward airspeed. Both engines flamed out prior to impact.

Investigation determined that the aircraft had entered a stabilized flat spin after the pilot used an improper stall recovery procedure. The accident is an expensive reminder that the CF5 is spin resistant but not spin proof. CF5 AOIs have also been amended to provide further amplification and clarification of the slow speed handling and spin characteristics of this aircraft.

My Little Bit Won't Be Missed

Some time ago a large celebration was planned in a little Spanish town. To prepare for this celebration, a large cask was constructed and each citizen was requested to bring a bottle of his finest wine and pour its contents into the cask.

One citizen, however, decided that rather than share his finest wine with the whole community, he would save it for himself by filling his bottle with water. The dilution with just one bottle of water would be so slight no one would know the difference.

Well, you guessed it. When the celebration commenced and the cask was tapped, nothing but water came out. It seems that everyone in this little Spanish town had the same idea – that "MY LITTLE BIT WON'T BE MISSED."

Of course this is only a fable, but apply it to accident prevention. Every person involved in aviation is expected to contribute his "little bit" toward preventing accidents. Usually, everyone involved – the supervisor, aviator, mechanic, technical inspector, or what-have-you – knows how and why a particular job has to be done. He is also aware that if the job is not accomplished correctly in accordance with established procedures, there is a possibility that an accident may occur. Yet, some of us have the same idea as the citizens of the little Spanish town – "MY LITTLE BIT WON'T BE MISSED."

Like the contents of the wine cask, accident prevention programs depend on everyone involved. Each one who fails to contribute his "little bit" to the task of accident prevention through an effective safety program takes that much away from its effectiveness.

It is unfortunate, but some of us are only "filling our bottles with water" and taking short cuts which hinder the accident prevention effort.

Let's keep in mind that aircraft accidents normally thrive on lack of interest, lack of team spirit, general neglect, and taking short cuts. Let's all contribute our "little bit" to the aviation accident prevention program.

USAAAVS FLIGHTFAX

Comments

to the editor

HOW DO YOU READ?
.....OVER

We didn't receive any letters for this issue but a phone call from an interested if somewhat bemused reader is worth following up. Our caller suggested that we were using many military abbreviations which were not generally understood by the readership as a whole and felt that we should explain the more obscure ones. We agree wholeheartedly. It is very easy to lapse into the jumble of jargon, mnemonics, abbreviations and acronyms which we use regularly in the flying business and forget that to others it may be just so much gobbledygook. There is also the danger of ambiguity. We all know the one about the pilot who called "Takeoff power" but things could be even more confusing. To wit:

The A/C leapt into the air with a howl. "Better get out of here, that's the worst T/D I've ever seen" thought the C/P to himself as he filled in the F/E. We've obviously got an A/C problem here so I'd better take control. I'll call T/O on the R/T, tell him that we've got a major U/S and RON seems the only answer.

Translation:

The *aircraft commander* leapt into the air with a howl. "Better get out of here, that's the worst *touchdown* I've ever seen" thought the *co-pilot* to himself as he *punched out* the *flight engineer.* We've obviously got an *aircraft* problem so I'd better take control. I'll get *takeoff* clearance, then with this major *unserviceability* we'll just have to *remain overnight.*

or perhaps:

The *aircraft* leapt into the air with a howl. "Better get out of here, that's the worst *temporary duty* I've ever seen" thought the *Chief of Personnel* to himself as he scratched away at his *claim.* We've obviously got an *aircraft commander* problem here so I'd better take control. I'll call *Toronto,* tell them we've got this *American Major* on board and then *Ron* can look after us.

The true story of fixed wing flight!

This Nicad Battery Caution Placard will soon be fitted in all aircraft using Nicad batteries.

CAUTION

NICAD BATTERIES

THERMAL RUNAWAY PROCEDURE

SYMPTOMS

HIGH BATTERY TEMPERATURE
DISCHARGE OF WHITE FUMES
SMELL OF BURNING PLASTIC

ACTION

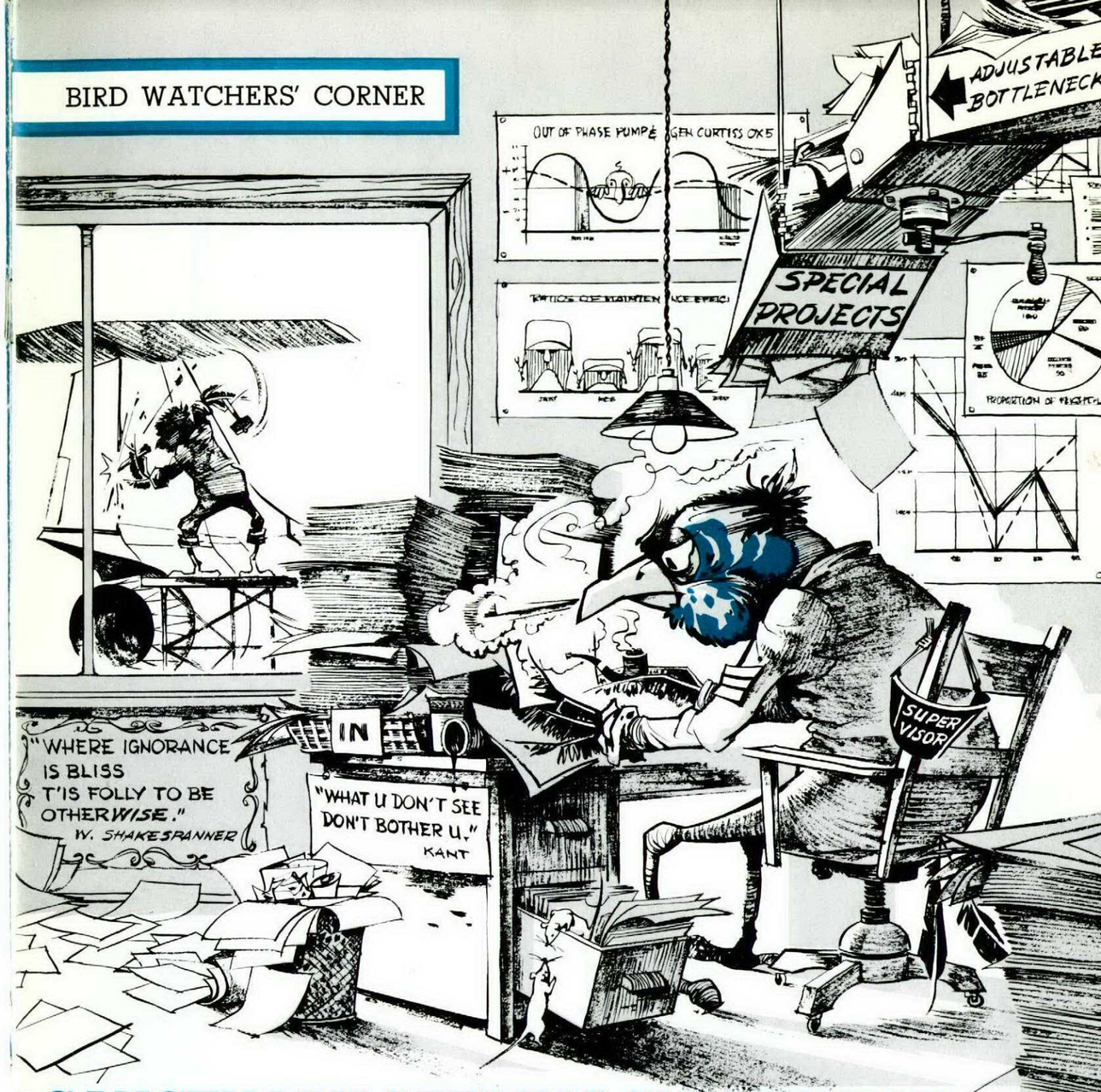
SHUT DOWN CHARGING SOURCE
CALL FIRE FIGHTERS
USE CO_2 COOLANT IF NECESSARY

NOTE

PROTECTION REQUIRED FOR HANDS AND FACE BEFORE HANDLING

CAUTION

BIRD WATCHERS' CORNER



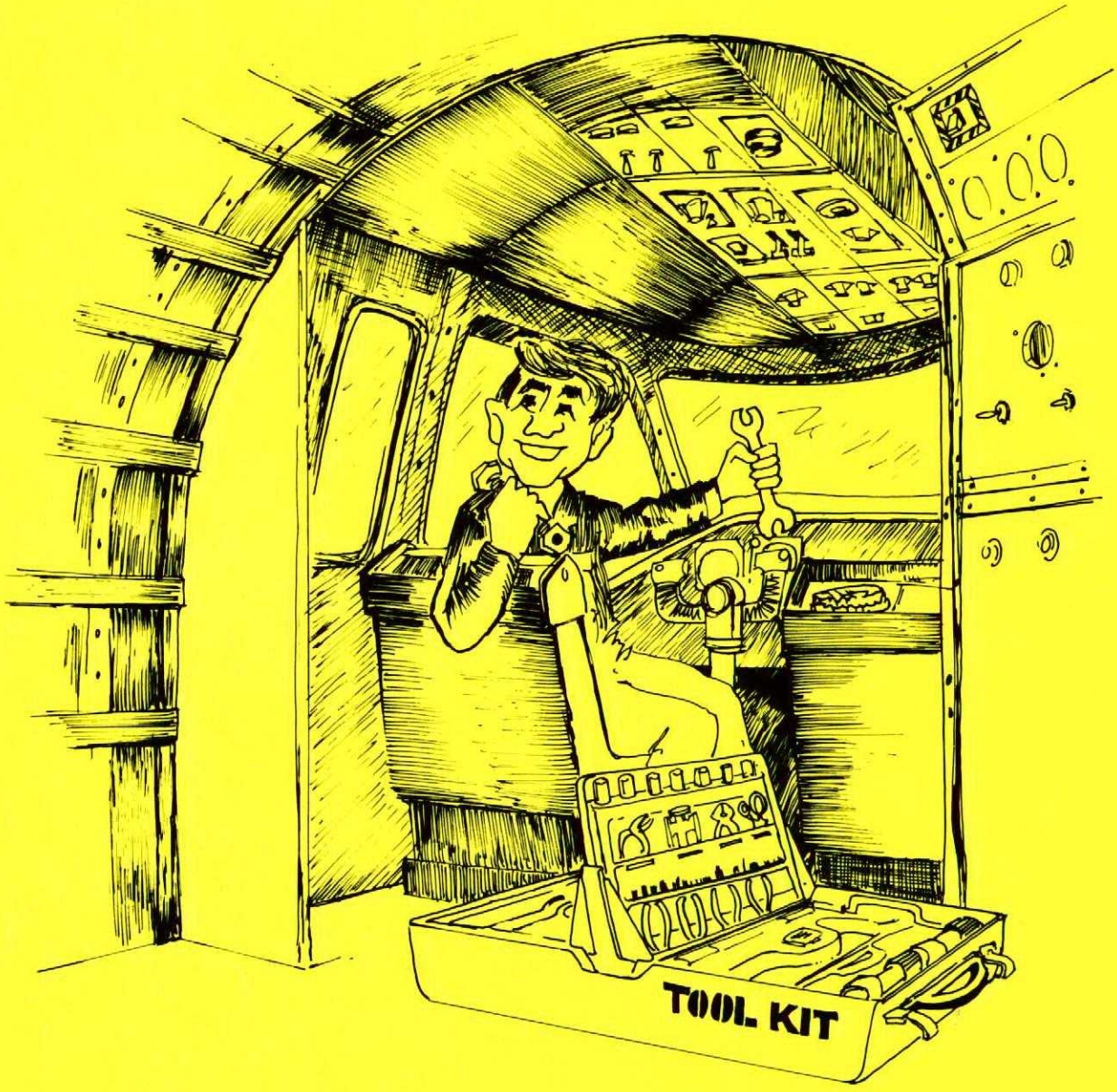
SANCTUARY-SEEKING SUPERVISOR

A whisp of smoke and intermittent mumbled protestations about "this d_____ paperwork", identify the Supervisorus Privatum. In his office retreat the hoarded nesting material—files, forms, charts, reports, memos, rosters, schedules, and the like—are painstakingly assembled and processed. Meanwhile, the maintenance work in the hangar proceeds uninterrupted by the annoying imposition of his on-the-job supervising. His desk nest, a bulging repository for the precious material, is transformed imperceptibly with the passing years into an enormous "IN" basket and the walls, resplendent with bureaucratic ornamentation complete the scene. Stationary among his stationery, the Sanctuary bird's call is scarcely heard above the rustle of paper and scratch of pen:

ONE-OF-THESE-DAYS-I'LL-GET-OUT-OF-THIS-MAZE

TOOL CONTROL...

You bet it works!



It's also practical and economical and is geared to equip all types of aircraft in the C.F.

AMDU Graphic Arts'74