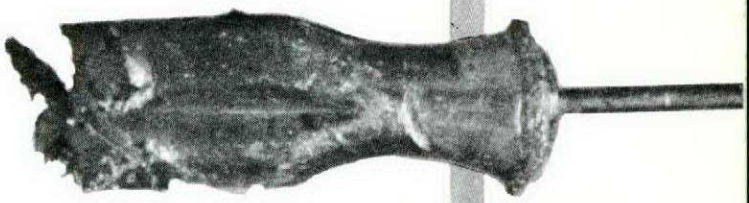
FLIGHT COMMENT

SEPTEMBER · OCTOBER · 1967



IN AIRCRAFT RECKAGE

Prior to 1965: ***once in 250***
1965–today: ***once in 5!***

Comments

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

Here's a follow-up to an earlier Comment on the longevity of G-Suits in storage. Operators have raised a requirement for the cutaway or "chaps" type of anti-G trousers. Models of this type which are now in use by the UK, USAF and USN have been evaluated; the cutaway suit, type C5U-3/P is best suited for Canadian Forces use and is compatible with other flying equipment. Before purchasing the quantity required for the CF5, twelve garments have been ordered for additional testing.

Intolerance is like fire – a bad master but a good servant. Take the lack of intolerance displayed by a unit which used incorrect, unserviceable chocks to secure an aircraft on a sloping ramp – a condition no doubt the supervisor and his men now feel is intolerable. Trying to do a good job with incorrect, unserviceable equipment calls for a good remedial dollup of intolerance. No system's so good that it cannot benefit from some well aimed anger.

The Monthly Accident/Incident Digest – MAID – produced by this directorate is, we think, making a valuable contribution to the flight safety effort. Paramount to achieving flight safety is the rapid dissemination of operating experience; this is what our MAID is all about. And we have received enough commendations of the digest to feel assured that our effort is worthwhile. We also have evidence that there are far too many who have never been introduced to our MAID service. Get on the MAID circulation on your station – by a brief phone call to the BFSO.

CANADIAN FORCES HEADQUARTERS — DIRECTORATE OF FLIGHT SAFETY

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DIRECTOR OF FLIGHT SAFETY

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FLIGHT SAFETY

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ACCIDENT INVESTIGATION

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ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1967

IN RETROSPECT

Several recent events have caused me to recall experiences from the so-called "good old days". Rest assured it isn't nostalgia or memories of past glories which come to mind, rather, it is lessons learned time and again which seem to be quickly forgotten and have to be learned again the expensive way.

I have chosen three examples at random from recent reports that illustrate this cause for concern.

After a lull of several years we suddenly had three occurrences in the past few weeks where jet aircraft were damaged by coming in contact with the runway after the undercarriage had been selected up. Who can argue that the lessons learned from the operation of the Vampire, F86, and other aircraft should have convinced every pilot that raising the gear at the earliest possible moment is a dangerous practice and unnecessary from an operating viewpoint.

Another accident that caused some "soul-searching" was a double flameout at low altitude which occurred while practising fuel selections for just such an emergency. The danger of such a practice was recognized fourteen years ago and at that time a warning was placed in the Aircraft Operating Instructions. However, in time the warning disappeared from the AOIs on this mark of aircraft and so a very experienced captain saw nothing wrong in setting up a situation which offered little margin for error if a fuel feed malfunction occurred. It did; the aircraft crashed, and the crew were fortunate to escape with only minor injuries.

The latest in a series of ground accidents involving loading equipment and aircraft might well be considered a classic example of history repeating itself. I quote from the CF210, "Supervision was lacking, however, the aircraft was late and the full crew were working in an attempt to hurry the loading". I ask you how many times have we heard the word "hurry" associated with accidents and how few times has this haste been justified?

The fact that the number of repetitive type accidents and incidents appears to be on the increase should indicate to everyone that we are not always profiting by past mistakes. The means of communication may be at fault, or more likely, we are trusting too much to memory and not ensuring that adequate warnings of danger areas are permanently recorded in publications such as engineering orders and operating instructions.

By now you are probably recalling accidents, incidents or close calls from past personal experience that you feel could trap the uninformed unless you do something positive to warn them of the hazards. If you are thinking this way, then my purpose will be well served.

G/C RD SCHULTZ
DIRECTOR OF FLIGHT SAFETY

An in-service lobby . . .

the UCR

Some items were criticized that aircrews had "learned to live with" for over a decade . . .

F/L J H Jones
MATCOM

John Citizen is outraged by a circumstance he finds intolerable. Being a good citizen he feels he must do something – by himself or in a group – to right the wrong. And he wants to act immediately, for if he waits for an opportune moment or an election, he stands to lose in two ways: he must "live with it" in the meantime, and he risks having other problems steal the public's attention, obscuring his own.

John Citizen's dilemma is not whether to act or even when to act. Having conviction, courage, and a sense of urgency he is going to act – now. His dilemma is *how* to act. Alone, and far from the ear of power, his is a voice in the wilderness. In the harsh reality of politics one letter to one MP while morally satisfying is not likely to be effective. Better seek out others of like opinion and together direct the protest into the ear of power. This is where the lobbyist could help.

The lobbyist has the ear of those in power; by judicious expenditure of funds he pressures and influences the lawmakers. Whatever the ethics of the system, he is effective. A measure of his success is that lobbying has reached full flower in the efficiency-conscious United States. Customers are prepared to pay large sums for his services. In 1965, spending by congressional lobbies reached almost $5,500,000; eg, $175,000 was spent on behalf of the United Federation of Postal Clerks.

Relating this to the service environment, a technician may discover an unsatisfactory condition. It is his right – and very definitely his responsibility – to report it. However, he has no two choices of when to act; he must act *immediately*. He might be prepared to "live with it", but others – aircrew and passengers – definitely are not. The authority to change things lies with CFHQ and MATCOM, but for a man to wait for a possible future transfer there is clearly ridiculous! Even if he did get there, just as in politics he might find too many other important things to do. So the time to act is *NOW*.

While democracy in the service might be open to question, there is nevertheless an effective lobby giving each of us immediate access to the ear of power – and it's free of charge. The serviceman's lobby is the commonplace little Stats 318 or Unsatisfactory Condition Report (UCR).

Let's take an example – in this case, fictional but very typical. Technician Smedley, over a hot coffee, recalls that in the past week he has replaced the same component on two of the unit's four T33s. He talks to his supervisor, and together they thumb through the L14s and find that four of these components have gone u/s in that month. True, a record of these replacements is already going in on the Technical Failure Reports (TFR), but they consider the situation requires immediate action. They speak to the Repair Officer who agrees that the situation warrants concern. A routine UCR is raised pointing out that the trouble appears to be in a seal; perhaps different material would be the cure.

The UCR is on its way – first stop, the Command. Here, a technical officer decides to query other units, and also raises a Command Special Inspection for installed components to be checked and replacement histories reported. He learns that while no other unit has had as much trouble as the one that prompted the UCR, several other units have replaced these components on their own T33s. A unit with only one T-bird replaced two of these components in the last month, but with only one aircraft, it had not been considered a trend. The officer at the Command with the bigger picture before him can see a trend developing. He upgrades the UCR to Urgent and passes it on to MATCOM, with the survey results.

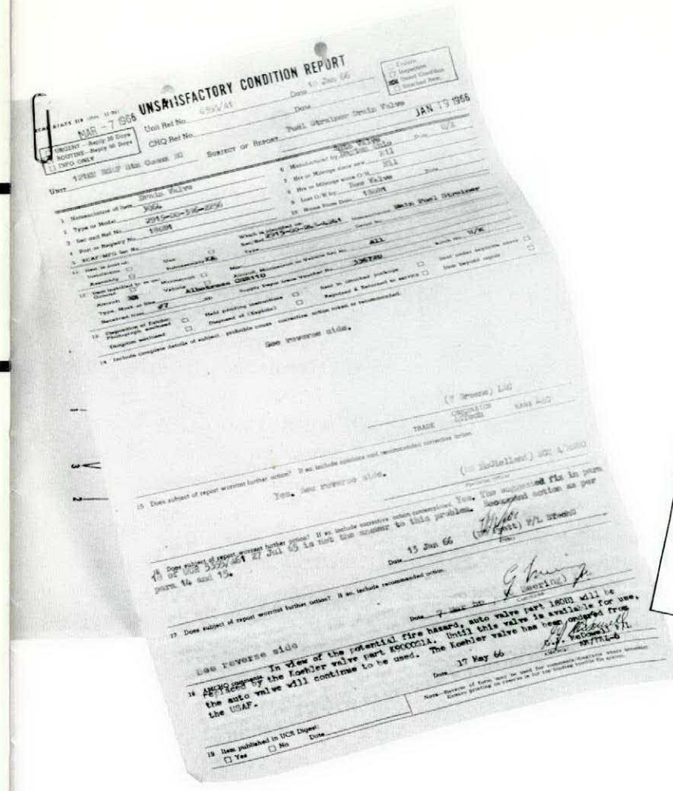
Now, the trend becomes crystal clear. The technical specialist, a senior NCO with many years field experience who has "lived and breathed" this component and several others like it for three years at MATCOM, checks with his supply counterpart to determine the number of items issued in the past year, what stock remains, how long it takes to repair and overhaul (R and O) the component, how many new ones are due in to the system, when the next batch are due out of overhaul, etc, etc. He knows the component is common to the CF100 and F86 as well as the T33, so he consults the CF100 and F86 Aircraft Officers, finds that while consumption at units operating these aircraft had not been high enough to warrant any great concern, it is showing an upward trend.

He then calls the Detachment Commander at the Technical Services Detachment (TSD) at the R and O contractor to determine if seal failure is the major cause of unscheduled removal. Two hours later this is confirmed; in fact, the contractor had already noticed the trend and was about to advise the TSD. In three or four hours all the strands have been brought together; the situation can be properly evaluated.

Stocks of the component and "dues in" indicate that the situation would not become critical for nearly a year but the contractor is authorized to make an urgent study of the problem. The originating unit and parent command receive returned copies of the UCR advising them of the action contemplated, and the information is passed to other interested formations.

The contractor recommends a retrofit modification, which is accepted. The technical specialist and his supply counterpart, together with the TSD, arrange a schedule to accomplish the retrofit without causing an out-of-stock crisis at the supply depots and units. The contractor encounters an unexpectedly long "lead" time in the supply of replacement seals due to shortages in the USA. The Department of Defence Production is able to achieve some improvement in this lead time but despite everyone's best efforts the occasional bird is grounded before the problem is licked.

Smedley continues changing the component in the field for a few months – in fact, at an increased rate – and before modified components reach the field he is transferred to another base (with no T33s). He is quite disgruntled and firmly believes MATCOM couldn't manage a "blow out" in a brewery.


UNSATISFACTORY CONDITION REPORT

JAN 17 1966

See reverse side.

15 Jan 66

See reverse side

17 May 66

CPL F GREENE

LAC F Greene, an aero-engine technician on second-line maintenance, noticed that the Albatross fuel system water drain valves were continually leaking. Later pinpointing the problem to drain valves of another manufacturer, he raised an Unsatisfactory Condition Report. In the reply, since no apparent design discrepancy existed with the new valve, only replacement of O rings was recommended.

Still not satisfied as this recommendation did not solve the problem, he resubmitted a UCR six months later. The escaping fuel was a serious fire hazard and his UCR proposal was reviewed. As a result of his second UCR the defective valves are currently being withdrawn from service.

Cpl Greene – then an LAC – exercised good technical judgement and a commendable persistence over a long period in eliminating a serious hazard in the Albatross.

The fact remains that it was his initiative that caused the UCR to be raised in the first place. This led to the fastest possible solution. Such a trend would have been picked up by usage figures from the MATCOM computer, by perusal of Technical Inspection Reports (TIR), or by the contractor.

Smedley, by being alert, saved six valuable weeks and the possible grounding of some aircraft, or even the fleet – he will never know!

He went away disgruntled. We hope that he gets back some gruntle at his new base and continues to keep his (our) eyes open.

Smedley's story was typical. In 1966, MATCOM received 911 Urgent, 4009 Routine, and 2866 Info UCRs and completed 884 Urgent, and 4051 Routine replies:

Command	Urgent	Routine
CFHQ	9	65
Training	127	505
Air Transport	149	855
Air Division	133	527
Air Defence	231	895
Maritime	190	757
Mobile (formed in year)	9	51
Materiel – TSU and TSD	35	245
– Other	28	109

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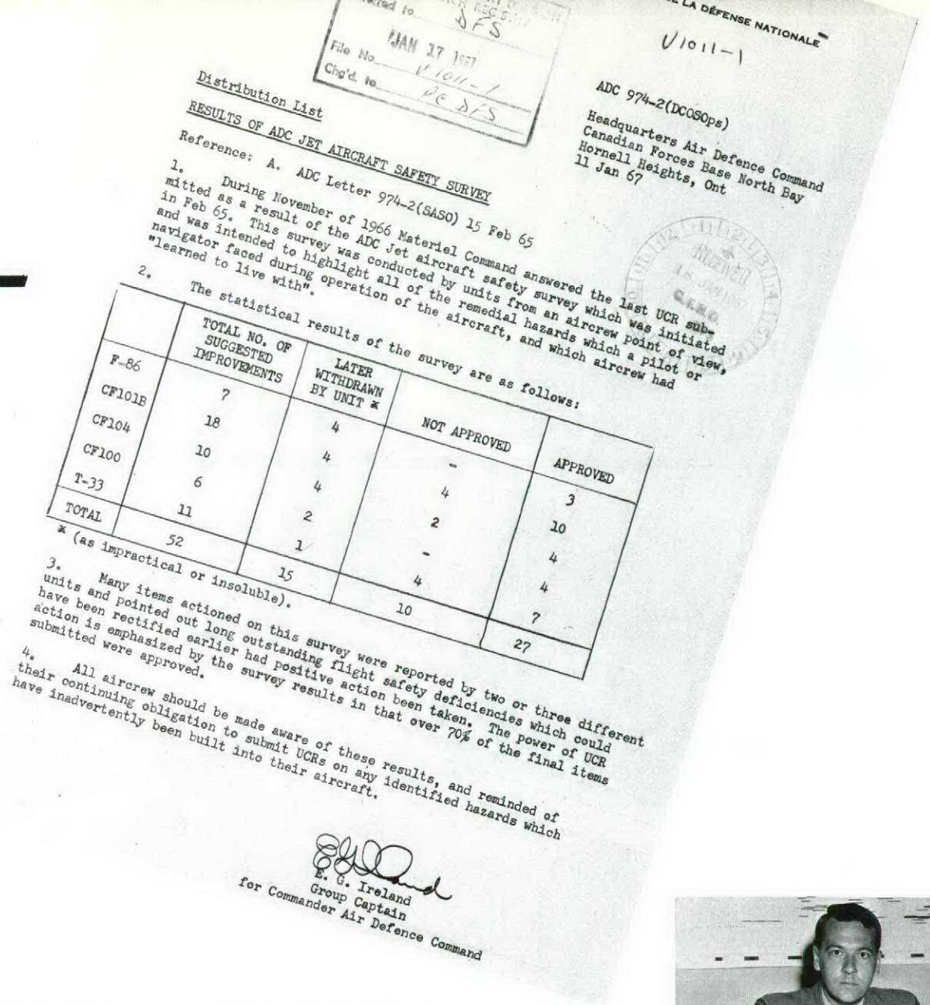


LA DÉFENSE NATIONALE

V1011-1

JAN 17 1967
File No. V1011-1
Chg'd to Pe DFS

ADC 974-2(DCOSOps)

Headquarters Air Defence Command
Canadian Forces Base North Bay
Hornell Heights, Ont
11 Jan 67

Distribution List

RESULTS OF ADC JET AIRCRAFT SAFETY SURVEY

Reference: A. ADC Letter 974-2(SASO) 15 Feb 65

1. During November of 1966 Materiel Command answered the last UCR submitted as a result of the ADC Jet aircraft safety survey which was initiated in Feb 65. This survey was conducted by units from an aircrew point of view, and was intended to highlight all of the remedial hazards which a pilot or navigator faced during operation of the aircraft, and which aircrew had "learned to live with".

2. The statistical results of the survey are as follows:

	TOTAL NO. OF SUGGESTED IMPROVEMENTS	LATER WITHDRAWN BY UNIT *	NOT APPROVED	APPROVED
F-86	7	4	-	3
CF101B	18	4	4	10
CF104	10	4	2	4
CF100	6	2	-	4
T-33	11	1	4	7
TOTAL	52	15	10	27

* (as impractical or insoluble).

3. Many items actioned on this survey were reported by two or three different units and pointed out long outstanding flight safety deficiencies which could have been rectified earlier had positive action been taken. The power of UCR action is emphasized by the survey results in that over 70% of the final items submitted were approved.

4. All aircrew should be made aware of these results, and reminded of their continuing obligation to submit UCRs on any identified hazards which have inadvertently been built into their aircraft.

E. C. Ireland
Group Captain
for Commander Air Defence Command

The big thing about MATCOM's "staffing" of a UCR is that the specialists have the whole picture. Unfortunately, the man on the flight line cannot be kept current on every phase of his UCR's progress. Too, his proposal may be incompatible with circumstances at other levels. Everyone must have heard of the Repair Officer who submitted a UCR just before he was transferred to MATCOM and found he had to answer his own UCR. In possession of all the facts, and despite the conflict of interest, he "shot down" his own UCR! The man is to be admired – and the lesson is clear.

In the final analysis no one ever got a rocket for submitting a UCR. It may get shot down or it may be of great value to the service. You may not benefit but someone else will. There may be no reward and you may not even see the results of your report. Admittedly, that's not much of an offer, but last year 8,000 servicemen took the time, made the effort, and properly discharged their responsibility to the service, and to their fellow servicemen.

You are urged to take a few minutes to look at EO 00-10-1 sometime – sometime soon!

F/L Jones, a native of England, began his aviation training with a five-year apprenticeship at De-Havilland aircraft of the UK. His first transfer was to CFB Trenton following which he did brief tours with United Nations air transport units in New Guinea and Yemen. Transferred to MATCOM in 1964 he has been employed in the Avionics and Aircraft divisions, and as Weapons Systems Project Officer for CF101, CF104, CF100, and F86. This tour ended with his recent transfer to the TSD at Scottish Aviation, Prestwick, Scotland.

the Supervisor and Safety

Who else can detect so readily . . .

By the time a supervisor has reached squadron service he has the best technical training available anywhere, has accumulated years of experience, is mature and professional in attitude, and has developed a sense of responsibility rarely found in other fields of similar endeavour.

He commands the respect of aircrew and groundcrew alike.

He delivers a product the pilot knows has had the best possible treatment. A reputation stands on this – experience has proven it to be so time and time again. Promulgate an intensive flying program and you can depend upon him to meet each commitment – on time.

Select good men to undergo good training and you achieve what we have – the very best.

He's certainly not overpaid. Promotion is often slow. He works longer hours often under less favourable conditions and reaps fewer benefits than his civilian counterpart. To this, add those "exigencies of the Service". Make one small mistake and the roof is apt to fall in on him.

Is he perfect? Well, – darn near.

You see, he may fail to take the initiative in ground accident prevention. Yet, of all those on the unit the supervisor can do the most in this field. Supervisors are found everywhere, working at every trade in every part of the hangar – in the workshops, on the line, in the aircraft – everwhere. Who else, then, can really see what's going on? Who else can detect so readily an accident in the making?

He works so closely with his men that he knows the careless, the reckless, the inexperienced. He can buck up the prop-arc walkers, the tool losers, the Indianapolis mule drivers, the engine jazzers, the non-fasteners of Dzus buttons, the non-grounders of fuelling hoses. He can with relative ease motivate his men to work in and at safety. He can alert the careless, reform the reckless, and teach the inexperienced. Opportunity abounds.

He may have to grow another arm and an extra eye but the results are worth it. Costly ground accidents inevitably occur as a result of carelessness – carelessness that could have been prevented.

And carelessness does not exist where motivation has been developed and sustained – by you, the supervisors.

LCDR T H Copeland

Verdict: Poor Design

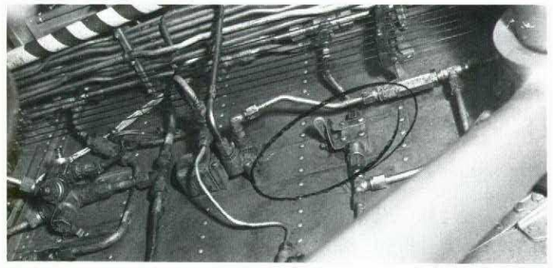
The investigator wrote, "Why incorrect selection has not been made in the past is not understood".

During a BFI a technician found the main hydraulic panel was covered with hydraulic fluid and the unserviceability was rectified. Later, after being airborne about an hour the flight engineer reported the main brake accumulator was 1500 psi below normal. The undercarriage was lowered using the emergency hydraulic system to preserve the main system pressure for nosewheel steering purposes.

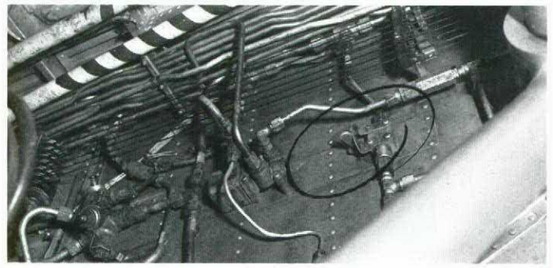
The aircraft was successfully landed. Fortunately, the main brakes and nosewheel steering functioned normally.

The main brake accumulator dump valve in the nosewheel well was found left in the open position by mistake. This little lever on the dump valve and the surrounding area is to be painted conspicuous matching colours to alert technicians to the safe and unsafe positions.

It's an invitation to error to install a hand-operated on-off lever and place it in a dark wheel-well – and then leave it completely unmarked.



Main brake hyd check valve in safe position



Main brake hyd check valve in unsafe position

GOOD SHOWS

SGT HP ROBERTS

Sgt Roberts, an intelligence operator, was at work in his office on the flight line when he heard a loud explosion. Through his office window he saw flames coming from an air compressor which together with another power unit was situated in the starting position near a CF101.

No one else was in the area and so Sgt Roberts, although unfamiliar with the equipment, ran to the scene and grabbed a fire extinguisher mounted on the equipment, opened the compressor's top cover and extinguished the flames.

Sgt Roberts' quick and decisive response to this emergency saved the aircraft from being damaged or even destroyed by fire.

CPL JC REDMOND

During a routine between-flight inspection, Cpl Redmond noticed a cylinder hold-down nut appeared to be crooked. A closer inspection revealed that the cylinder hold-down stud was broken and the stud adjacent to it later found to be cracked. Cpl Redmond's alertness probably prevented a complete cylinder failure and further damage.

Only a sharp eye and a very conscientious and professional approach to routine inspections can reveal faults of this nature; an effective flight safety program is dependent on such high quality performance.

CFN WEJ BRYDGES

Cfn Wayne Brydges, an aircraft technician, was assigned to clean the area beneath the cockpit floor as part of a periodic inspection on a CH113A helicopter. While cleaning around the base of the cyclic control stick he found a coin lodged between the base of the stick and the stick yoke. Only the edge of the coin was visible. In this position, the coin could have jammed the flight controls.

Cfn Brydges is to be commended for his alertness in finding a barely-visible foreign object which could have caused an accident costing the lives of the crew, and a million-dollar aircraft.

CPL LD BURKE

While Cpl Burke was on a post-flight inspection of a T33, the rivets on the inner face of the starboard intake duct attracted his attention. Closer examination revealed that a number of these rivets were loose, an unserviceability which he reported in the aircraft record.

Fortunately, in this case the condition was not hazardous but the fact that visual inspection of this area is not a requirement on PFIs demonstrates the vigilence and thoroughness of Cpl Burke's inspection even on the so-called "routine" jobs. Flight safety files attest to many lives being saved by alert technicians.

CPL JE MURPHY

Cpl Murphy was performing a routine inspection on an Argus, but his discovery turned the inspection into something quite out of the routine! Displaying meticulous attention to detail he discovered that both connectors on the fuel hose leading to number 3 engine and one connector on the hose to number 2 engine, were cracked. The cracks were very difficult to see. His timely detection of this extremely hazardous condition may have prevented a very serious accident.

Cpl Murphy followed up his discovery with commendable initiative in locating replacement parts while on detachment operation outside of Canada.

LEADING SEAMAN J LUCAS

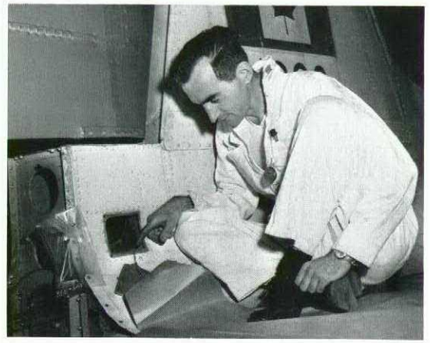
Leading Seaman J Lucas, on a routine inspection of a Tracker, noted what he considered an excessive vertical play in the starboard elevator. On further investigation, he discovered cracks in the horizontal stabilizer outboard rib assembly. The excessive play in the elevator was at first attributed to these cracks but Leading Seaman Lucas found sheared rivets on the hinge assembly and also on the lower skin of the stabilizer. All Tracker aircraft were grounded and similar defects were found in other aircraft.

By uncovering the damaged condition of this aircraft, Leading Seaman Lucas averted what could have been an extreme hazard. Observation of detail and the integrity to pursue the investigation resulted in an outstanding contribution to flight safety.

CPL E KELLY

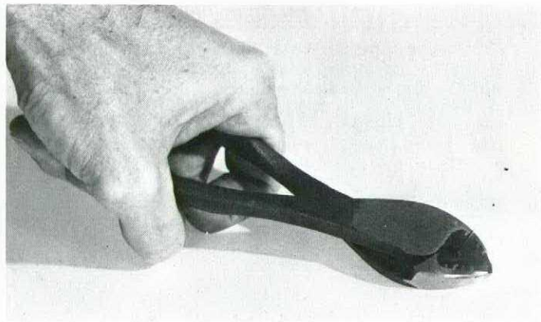
During a BFI on a Dakota, Cpl Kelly discovered a fracture in the lower rudder hinge bearing bracket. The crack was not readily discernible because of the location and the small extent of the fracture. Further, this region is a PI item only, which would not normally be inspected on a BFI. Because a special inspection had been called up against this item in the past, Cpl Kelly made a point of inspecting it as a suspect area.

Cpl Kelly displayed the qualities of a first-class technician by performing a detailed and meticulous inspection. His conscientiousness probably averted a very serious accident.



The Locking-Wire Menace

New pliers will come to grips with this problem . . .

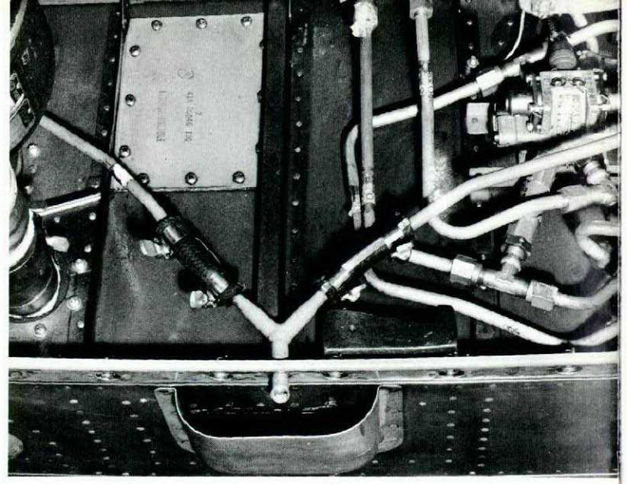


They are now available - use them
Ref: 5110-21-842-8570

Bucking Bar, Anyone?

By accident (to use the term loosely) someone had abandoned a two-pound bucking bar on the rear lip of a Tutor's engine lower access hole.

The quest continues for the man whose tool kit is two pounds lighter than it should be.



Saved by Simulator

While cruising in a helicopter at 3000 feet the flex drive-shaft of number 1 engine failed. The aircraft was recovered at a nearby base without further incident. The report reads "... simulator training on emergencies (too dangerous to duplicate in practice) enabled the pilots to recognize the failure and react promptly thus preventing possible further damage due to engine overspeed".

Four Jocks Top 1000 in 104s

G/C C Allison, 4 Wing base commander, congratulates the four 1000-hour pilots. Left to right: F/L Platz, F/L Worthy, S/L Spencer, S/L Deacon.

F/L PLATZ joined the RCAF in 1951 as an airman. After initial training he was stationed at Winnipeg, as a telecom technician. Selected for aircrew, he received his wings in 1954, and was posted to 422 Sqn, 4 Wing. In 1958 he was posted to the German Air Force base at Oldenburg, Germany, as an instructor. In 1961 he was transferred to the CF104 OTU at Cold Lake, Alberta after seven years in Europe and 2000 hours in the F86. F/L Platz left Cold Lake in 1965 for 4 Wing. This year, he was posted to Air Div HQ as Staff Officer Operations.

F/L WORTHY received his wings in 1951, flew F86s with 416 Sqn, Ottawa. He went to 2 Wing when 416 Sqn was moved there in 1952. From 1953-5 he flew 86s with the Overseas Ferry Unit at St Hubert, to the Wings in Europe. From 1955 to 1958 he was a fighter weapons instructor, and later a flying instructor on T33s at Macdonald, Manitoba. From 1958 to 1962 he was a GCI controller at Mont Apica, and St Margaret. He commenced CF104 training in the summer of 1962.

S/L SPENCER joined the RCAF in 1951 as an airman and spent one year as an aero-engine tech at Summerside. He received his wings in 1954. He instructed at 2 FTS, Moose Jaw, for three years. In 1957 he was transferred to 430 Sqn, 2 Wing, France. After approximately 1000 hours in the F86 he was transferred to the OTU, Cold Lake, as a CF104 instructor. S/L Spencer joined 444 Sqn in 1965; he is presently 4 Wing's Tactical Evaluation Officer.

S/L DEACON joined the RCAF in 1950 and received his wings at Centralia, Ont in 1952. He flew F86s with 421 Sqn at Zweibrucken. In 1955 he joined the staff of the Sabre OTU at Chatham. After 1200 hours on the F86 he was transferred to St Margaret, as a GCI controller. He also spent a GCI tour at Holberg, BC. He began CF104 training in 1962.

The Long Weekend

Two officers
"... took off on a VFR cross-country to Namao.
It apparently was the captain's intention
to fly his passenger
to Edmonton
for the long weekend..."

Eighteen minutes after takeoff the T33 struck the ground at high speed killing both pilots. The aircraft crashed with a very steep angle of bank in near-horizontal flight. A farmer who saw the aircraft moments before it crashed said the aircraft appeared twice; it had passed overhead, disappeared, had circled back, then was gone in the same direction. From this the investigators deduced that the pilot had run into bad weather, then turned around, and attempted to "have another go".

The farmer also testified that "It was raining pretty heavy at the time, a heavy shower with lots of wind". The farmer continued, "...It was overcast, you couldn't see any more than say, well, I would estimate 1500 feet or 1000 feet – not any more – and we could just see him through the clouds..."

The pilot, therefore, had approached an area of heavy rainshowers, reduced visibility, and a ragged ceiling, turned through 360° in a very steep angle of bank and on completion of the turn flew into the ground.

Why had this young flying instructor with over 800 hours flying experience, opted for a 360 instead of a 180? The answer perhaps is that he had flown into – and through – the same weather system only the day before! Possibly emboldened by his previous experience he misjudged the severity of the storm. Certainly, the weather reports gave him no warning that the frontal region was generating such intense cloud activity.

During the week the pilot had made arrangements to fly to Edmonton and then to Winnipeg with a passenger. A briefing had been requested for Saturday morning, but for a trip east to Winnipeg. The forecaster had been in his office until half an hour before projected takeoff time but he saw no one. He left, and the section reverted to the usual "on call" status for forecast service. Later, the two officers arrived at the Met section, requested the Swift Current weather of the airman on duty, looked over the weather reports and departed.

The latest weather forecast issued by Winnipeg and Edmonton indicated ideal VFR conditions for the flight. No cloud was forecast below 6000 feet MSL and although rainshowers were expected to occur in the frontal zone, no appreciable deterioration of visibility in these rainshowers was forecast. From the standpoint of clouds and weather both forecasts were similar but in the regional portion of these forecasts only Edmonton mentioned the strong surface winds associated with the frontal passage. The captain, therefore, knew that he would be penetrating a frontal zone but there was no information available to the Met service about a frontal build-up. Unknown to him, at the same time the captain was reading these weather reports a radar station only 20 miles from the crash site had observed severe rain clutter on its low-altitude scanning.

The short flight was to be in good weather, so the pilot filed VFR. The board members very carefully tried to establish the circumstances leading to the pilot's decision. Beyond the fact that the captain was known to prefer going VFR on such flights if conditions permitted, there was nothing to suggest that the trip should not have been conducted VFR.

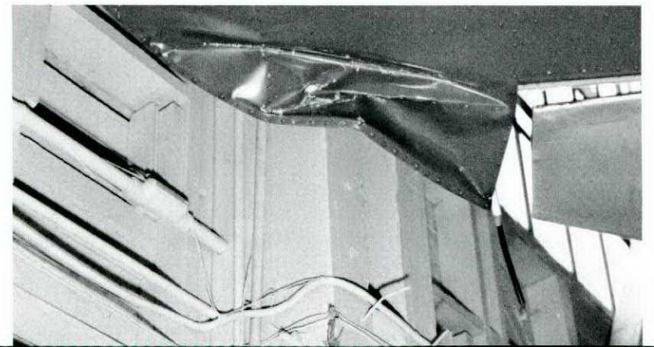
That's the outline story from an inch-thick file – the bare details of a needless tragedy. As old as aviation – indeed of world history – is man's disinclination to accept the limitations of himself and his resources. It's the stuff that heroes are made of, to be sure, but there are times when the price is too high.

"my attention was distracted from the wingtip..."

This commonplace wingtip/hangar impact belongs in the *Gen from 210* section but is placed in this more conspicuous spot to call attention to a phrase coming into popular use in the Canadian Forces.

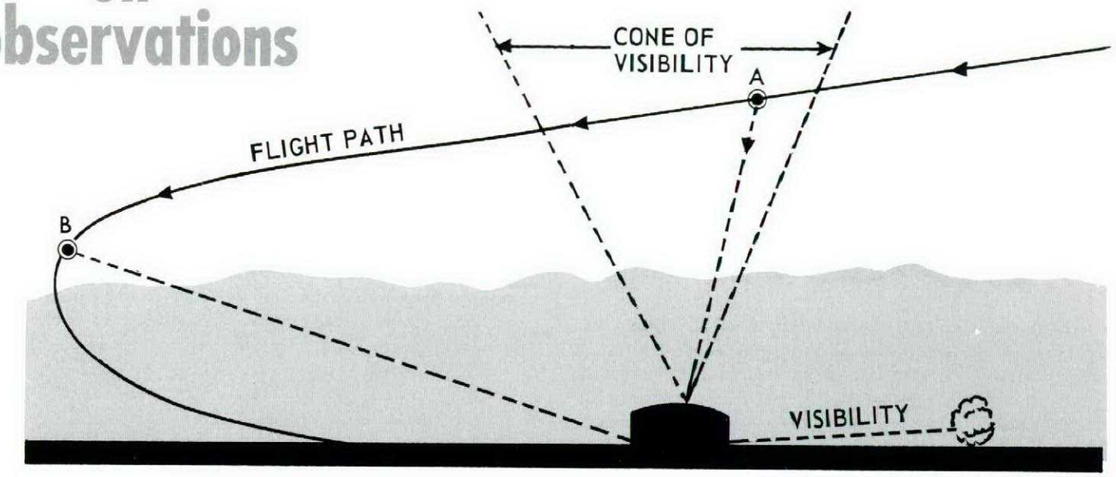
The phrase is in the title and was used by the wing watcher. He is not alone; the phrase appears almost verbatum in many of our ground accident reports.

The lesson is clear: when wing walking, don't be distracted.



A little fuzzy on observations

Now is the time to be alert for obscured and partially obscured sky conditions in aviation weather reports . . .



"Tower, Whiskey One-Two. Say again on the ceiling."
"400 feet."
"Is that a measured ceiling?"
"Negative."
"Pilot reported ceiling?"
"Negative, the weather observer . . ."
"Ah! It's an estimated ceiling."
"Well, not exactly. The weather observer thinks he can see up into this stuff about 400 feet."
"He thinks he can see up about 400 feet! What kind of a ceiling is that?"

I'm glad the pilot asked. This conversation involves a sky condition known as a total obscuration – a condition reported when surface-based obstructions to vision obscure ten-tenths of the sky. It can be caused by haze, fog, smoke, dust, blowing snow, blowing dust – among other things – and being a total obscuration, prevents the observer from seeing any clouds which may be above the surface-based weather phenomenon. Because ten-tenths of the sky is covered, such an obscuration constitutes a ceiling. This creates a problem for the weather observer and the pilot.

Whenever a ceiling is given in the Aviation Weather Report, the ceiling value and the ceiling classification must also be reported. In the case of a total obscuration (surface-based layer with a summation opacity of ten-tenths) there is no way to measure it with a ceilometer because its base is on the ground. The ceiling height reported by the weather observer is his estimate. However, he may use a balloon during daylight hours, and a ceiling projector during the hours of darkness as aids in determining the vertical visibility. Even though one of these methods has been used he cannot classify the ceiling as a balloon or measured ceiling. The term ESTIMATED can't even be used. If the vertical visibility is determined from information given by a pilot the height classification AIRCRAFT is then employed.

Ceilings due to obscurations as reported by a ground observer are termed INDEFINITE and can be identified in aviation weather reports by a W before the ceiling value. Total obscurations are identified by the symbol X. Examples are W4X1S – (indefinite ceiling 400 feet obscured, 1 mile visibility in light snow) and WOXOF (ceiling and visibility zero-zero in fog).

The term INDEFINITE is used for a very good reason. Remember, that in W4X the 400 feet is an estimate of vertical visibility by the weather observer. Unless there is a glass bottom in your cockpit, your chances of seeing the runway when you get down to 400 feet on the approach are not too good You should consider that the weather observer is standing still and looking vertically into the obscuration while you are moving fast and looking through it the long way – almost horizontally.

Weather phenomena creating obscurations can occur any time of the year but they become more frequent during the late fall, winter, and early spring seasons. Any obscuration should be considered a marginal weather situation.

Don't forget about partially obscured conditions. Partially obscured sky conditions cover less than ten-tenths of the weather observer's view of the sky yet do not constitute a ceiling by themselves. The same weather conditions that cause obscurations can cause partial obscurations. The only difference, from a weather reporting standpoint, is that with partial obscurations the fog, haze, smoke, dust, or what have you, is not thick enough or extensive enough to prevent the ground observer from seeing some blue sky, some stars, or some of any clouds that may exist in the area.

Partial obscurations are identified as -X in aviation weather reports – and the minus sign doesn't mean thin. For example, -XE15 ⊕ 2S-H may mean eight-tenths coverage by a partial obscuration extending up to what appears to be complete cloud coverage at an estimated 1500 feet filling the other two-tenths portion of the weather observer's view. Without looking in the cloud group of the aviation weather report, the same report could mean two-tenths coverage by a shallow partial obscuration with a very definite cloud deck covering the other eight-tenths of local sky. The cloud group of the aviation weather report won't tell you how thick the partial obscuration is, but it will tell how much of the weather observer's view of the sky is obscured. For example, F6 in the cloud group would indicate six-tenths of the sky obscured by fog. BS8 would indicate eight-tenths of the sky obscured by blowing snow; K3 would be three-tenths of the sky obscured by smoke.

Now that we've covered sky-cover as it is affected by partial obscurations, consider the possibility that you are given a local aviation weather report that indicates no ceiling but prevailing visibility at or just above minimums, (see drawing). While flying over the base, you can see the ground quite clearly. Surely you've had the experience with this kind of weather condition. Take -X1/2F. Sky partially obscured. No clouds reported. Prevailing visibility one-half mile in fog. The fog layer could be shallow; you and the weather observer can see vertically through it with no problem. But when you get low enough on the approach, you'll be looking through the fog layer the long way and then, for all practical purposes, without a cloud in the sky, you have a ceiling because of the limitation on your slant visibility. Prevailing visibility does not have to be reported at or near minimums for this effect to take place.

Points to Remember

- Treat sky conditions reported as obscured and partially obscured as marginal weather conditions, even though you may not have a large family.
- The ceiling value with an obscured sky condition is an estimate of vertical visibility; don't expect to break out at that altitude on the approach.
- A partially obscured condition doesn't constitute a ceiling but it can cover as much or more of the local sky as a broken deck of clouds. The amount of coverage by a partially obscured condition will be given in the cloud group of the aviation weather report.
- A partially obscured condition may be thick or thin, extensive or localized, depending upon the nature of the weather phenomenon causing it. Even if only a thin layer is involved, a partially obscured condition may present serious slant visibility restrictions on approach.
- If you make an approach in an obscured or partially obscured condition, it would be most helpful if you would report your slant visibility or approach ceiling so that it can be passed as a PIREP.

adapted from an article by Lt Col LE Zapinski in SAC COMBAT CREW

Flash-back

The aircraft shall be inspected daily to ensure it is safely moored.

– CFP100

STUDDED TIRES

	Dry Asphalt		Dry Concrete		Clear Ice	
	Stud	Conv	Stud	Conv	Stud	Conv
Distance to stop in feet - from 20 mph	21.3	19.5	21	19.7	53.5	151
Distance to stop in feet - from 40 mph	85	76.7	83.7	78.8	215	603
Time to stop in seconds - from 20 mph	1.45	1.3	1.4	1.3	3.55	10.3
Time to stop in seconds - from 40 mph	2.95	2.65	2.9	2.7	7.3	20.6
Retarding force pounds/ton	1410	1550	1432	1522	560	201
Rate of retardation feet/sec/sec	20.3	22.5	20.6	21.9	8.04	2.89
Rate of retardation mph/sec	13.8	15.2	14.1	15.0	5.06	1.98
Gradient at which vehicle can be held %	81.1	95.4	83.3	92.8	25.8	9.03

Table I

Braking test results with 216 studs installed in twelve lines on all four wheels of the B20 1/2-ton pick-up truck.

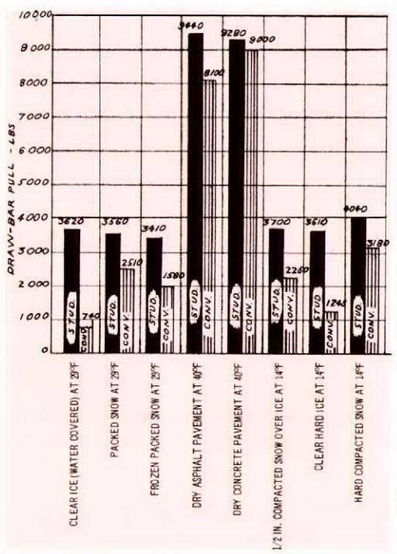


Table II

Draw-bar pull of studded tires vs conventional for the D8 aircraft towing tractor.

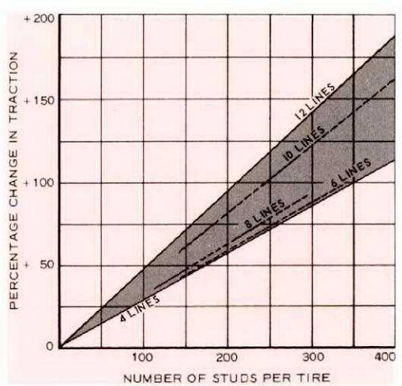


Table III

Effect on traction on ice, of various numbers of studs and mounting arrangements, (valid for light vehicles only).

One of the hottest sales items around tire shops last winter were studded tires – a recently introduced innovation (developed 12 years ago in Europe) which tire stud makers claim will increase traction up to 500%.

Last winter the Central Experimental and Proving Establishment (CEPE), Automotive Section, at Uplands tested studded tires to find if studs were worthwhile and if they were applicable to service requirements – particularly, the towing of aircraft. The tests employed a D8 aircraft towing tractor and a B20 half-ton cargo truck. Ballast brought wheel weights to the same level, on the B20. The number of studs used was in accordance with the stud manufacturer's recommendations – five studs per 100 lbs of vehicle weight per tire for a 4-wheel installation. The D8's tires were studded with 196 studs in 12 lines to provide a pattern compatible with the tread design. The studs used were a commercially-available product costing 6¢ each for car studs and 12¢ for truck studs.

The stud itself is a flanged steel jacket with a protruding tungsten carbide core; it is this core which "digs into" the ice to provide the traction. The tungsten carbide core is extremely hard to resist wear from concrete and asphalt surfaces; a properly installed stud will serve for the life of the tire. Actually, the manufacturer aims at matching plug wear with tire wear.

For these tests, tires were studded at the unit – a job requiring a high-speed drill, an air-operated inserting tool, a depth gauge and hand-setting tool. The inserting tool has jaws which are pushed to the bottom of the drilled hole; these separate and stretch the hole when the stud is rammed into the tire.

- Studs should be fitted only in tires with lugs of solid rubber of at least 5/8" for a car tire and 3/4" for a truck tire. Otherwise, studs will probably be ripped out and can even promote destruction of the tire tread (Figure 2).
- Studs mounted off the vertical soon disintegrated, as Figure 3 shows.
- Natural rubber tires performed best.

Test Results

The results were most encouraging. While under dry conditions studs were a drawback, they readily proved their superiority on ice. Table I shows the tractive efficiency of the studded tire on ice – quite a margin over the non-studded tire. Table II also compares conventional tires vs studded under various conditions.

A draw-bar pull test revealed the effect of different numbers of studs on traction. The draw-bar readings were taken the moment before the wheels started to spin.

Table III shows, not surprisingly, that more studs mean more traction. However, of even more significance is the number of lines achieved by the pattern. Figure 3 shows two stud patterns used in obtaining the results shown in Table III.

Durability and Wear

The B20 vehicle was driven 5287 miles in seven weeks. Stud wear on every stud line of each tire was accurately measured at intervals between 500 to 1000 miles. At 4171 miles nine studs were missing from the left rear tire. By 5287 this had increased to 22 studs. All missing studs were from lines 5 and 6 which are close to the centre of the tread. As these tires were deliberately over-inflated, the road testing demonstrated that:

- Proper tire inflation is important both for stud retention and tire life.
- Studs should be confined to the edge areas of the tread pattern, leaving the centre portion of the treads clear.

Do They Damage Surfaces?

During the test program the effect of studded tires on various pavement surfaces and hangar floors was continuously monitored. Three distinct types of damage were observed:

- **Rolling** – no turn, constant speed – insignificant from light vehicles – acceptable for heavy equipment – truck studs (on D8) left circular impressions 1/8" deep.
- **Sharp turn** – acceptable from light vehicles which leave small oblong depressions – serious, especially on hangar floors where the towing tractor produced gouges 1/8" deep, up to 1-1/4" long.
- **Spinning and skidding** – comparable to chain-equipped light vehicles – severe with the towing tractor, which produced long furrows up to 1/4" wide and 1/4" deep.

The report concludes, "The effect of a stud equipped light vehicle on any pavement was negligible except when skidding or spinning the wheels where it was comparable to the present tire chains. On a heavier vehicle equipped with the larger truck studs, the effects were more visible and destructive. This equipment should

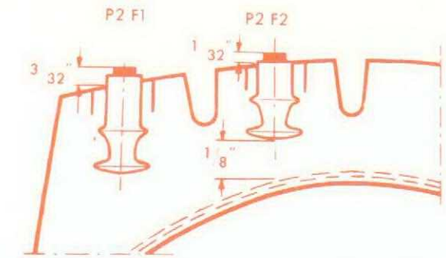


Figure 1

Proper installation of studs in tires, showing desired protrusion and minimum cushion clearance between stud-head flange and tire carcass.

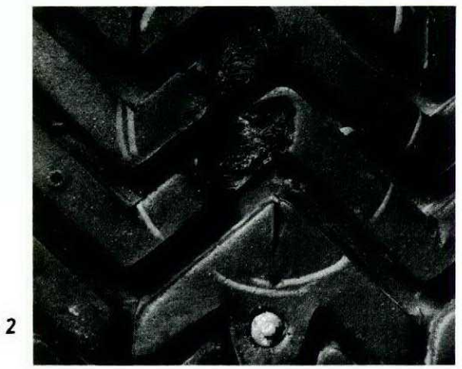


Figure 2

Studs mounted in tread lugs of insufficient rubber tore out readily, damaging the tire.

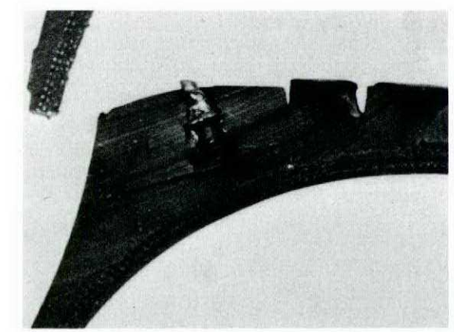


Figure 3

Abnormal wear of a stud mounted off the vertical.

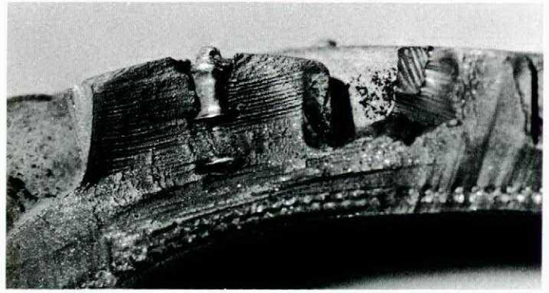


Figure 4 Normal wear of a properly installed stud.

not be driven on hangar or shop floors unless absolutely necessary. On outside pavement, the normal rolling marks were acceptable, but operators should be instructed to avoid wheel skidding or spinning on dry asphalt or concrete pavement."

Summing Up

Studded tires should be used only during winter months, necessitating tire changes and higher inventory. There is no doubt that the added labour and equipment will cause more expense – but a bargain at the price if aircraft towing operations can be made more safe.

The most dramatic finding of the test series was the five-fold increase in traction delivered by the D8 towing tractor on clear water-covered ice at 29°F. The truck studs kept the draw-bar pull of this unit above 3400 lbs under all test conditions. The increase in traction for the D8 both on dry asphalt and concrete pavement derived from the weight of this tractor which was heavy enough to drive the studs into the surface. The lighter truck actually showed a slight decrease in accelerating and braking power on dry pavement.

Economical? A set of hand-operated tools to stud light vehicle tires would cost about $300 but powered automatic tools recommended to stud truck's tires would be worth over $1000.

The crux of the matter here is: Will the driver deliberately or even unconsciously operate his vehicle up to the increased limits of the studded tire, reducing the margin of safety to the studless configuration? It's obviously up to the driver to make the studded tire an asset to the safety program.

F/L Salois delivers an address on the studded tire tests before an Air Force/Industry safety conference at Rivers, California. F/L Salois was project engineer of the CEPE tests.

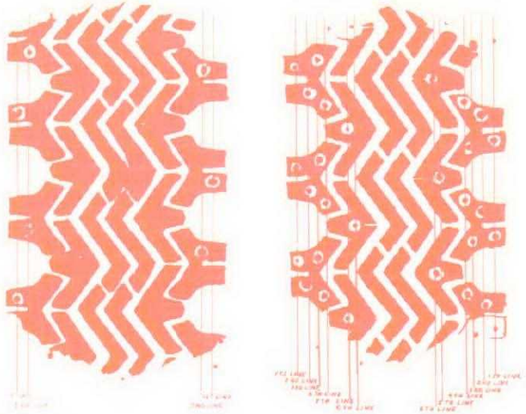


Figure 5

Tire on left has 72 studs in four-line pattern; the tire on the right has 366 studs in twelve lines.

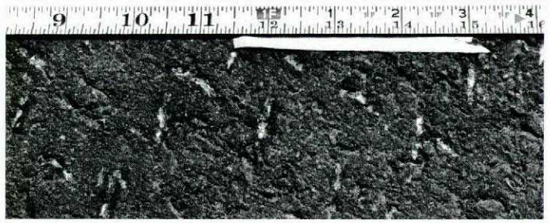


Figure 6

Towing tractor produced these marks in asphalt pavement during a sharp turn.

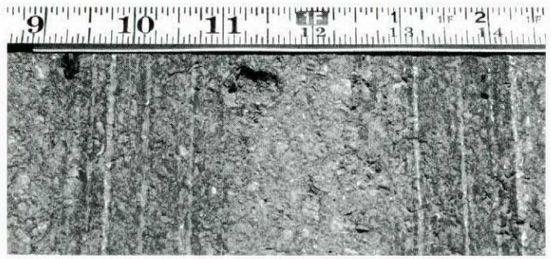


Figure 7 Car studs on light vehicle produced these furrows with locked-wheel braking on asphalt pavement.

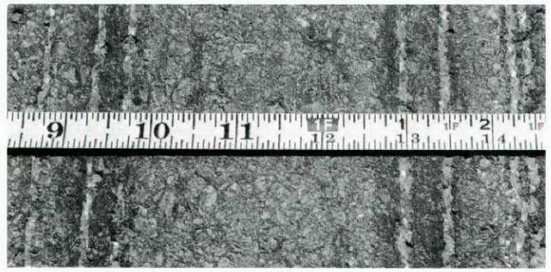
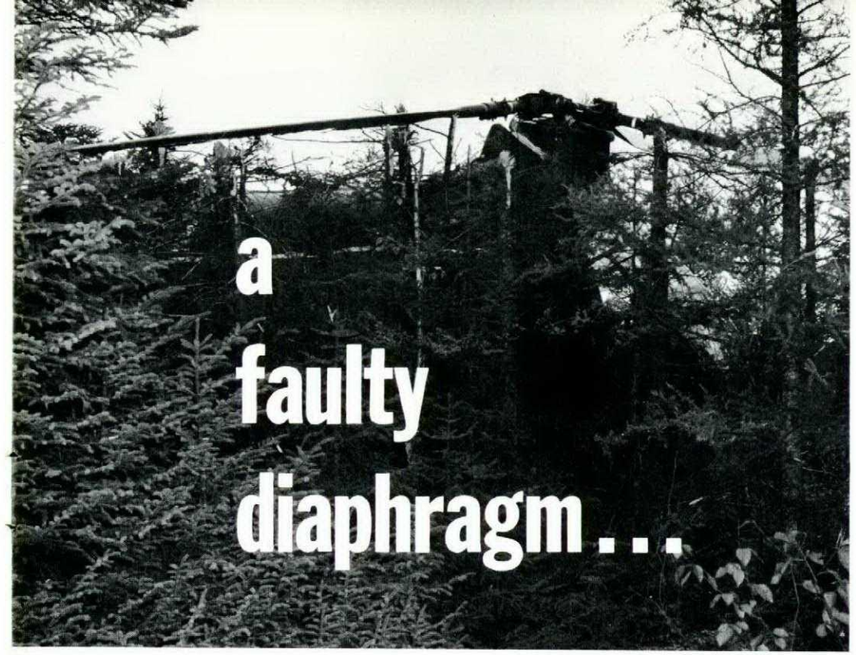


Figure 8 Locked-wheel braking by towing tractor produced grooves in asphalt pavement.



a faulty diaphragm...

Severe rotor damage after severing trees.

◁ H21 sits rotor-deep in pines.

A power loss on overshoot over rocky wooded terrain is a challenge to any helicopter pilot. Throw in a nearby powerline and you have the ingredients for a disaster...

The pilot was demonstrating to a senior officer some basic helicopter manoeuvres. Following a circuit and approach to a field the pilot overshot, applying power for for the climb-away. Just then, the rpm began to drop. More throttle and a lower collective had no effect. To attempt to regain rpm by further lowering the collective would have meant striking a hydro line; the pilot continued straight ahead till he cleared the power lines. By now, the aircraft had nowhere to go except down, and was aimed at an outcropping of rock in the forest below. The aircraft made a 60° gentle descent but couldn't avoid the trees. Just prior to impact the front rotors chopped into some small pines, and the aircraft wound up sitting on some larger trees about 6 to 8 inches in diameter. Fortunately no one was injured.

On an engine test-run (several months later), the carburettor was found to be delivering an excessively rich mixture in the power range the pilot used on overshoot. A poppet valve diaphragm had moved out of position causing the valve to assume a very rich setting. This would give poor acceleration in the low power ranges.

This diaphragm had been withdrawn from service about two years before as unsatisfactory; its replacement has been practically trouble free. Lying dormant on the shelf, an old-type diaphragm had been installed by a civilian contractor who had earlier overhauled the engine.

A lack of communication had jeopardized the lives of three pilots and nearly lost us an aircraft.

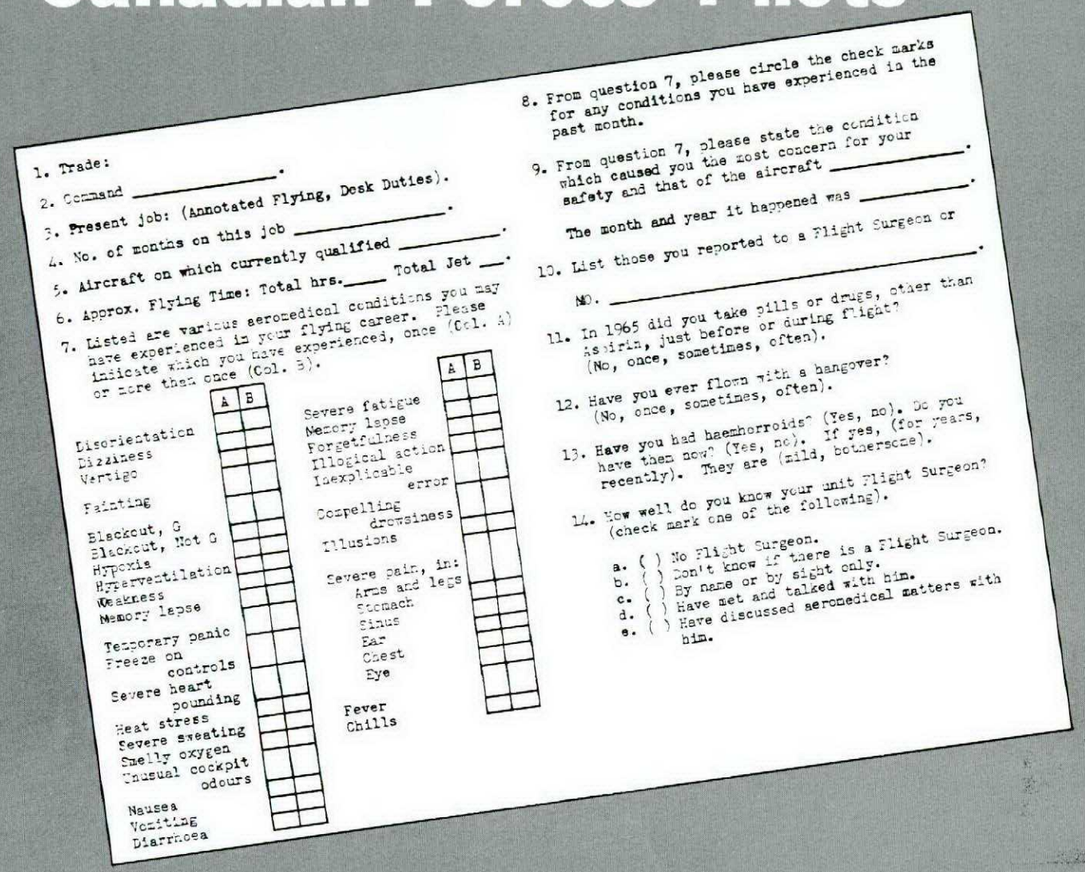
No Self-Restraint!

The transtech walked towards the open-ramp end of the Hercules during an air-drop mission. His safety harness was OK but the restraining strap was missing – the aircraft was on loan to the unit for this flight. So, he had used as makeshift, a standard tie-down strap hooked to the safety harness, and secured it (he thought) to a cargo fitting on the floor.

Before he had completed his one-way walk to nowhere an alert crew member noticed that the strap had come off the floor tie-down fitting!

Navy men will assure you that the sea is most unforgiving – so is the air.

Aeromedical Incidents in Canadian Forces Pilots



1. Trade: _____.
2. Command _____.
3. Present job: (Annotated Flying, Desk Duties).
4. No. of months on this job _____.
5. Aircraft on which currently qualified _____.
6. Approx. Flying Time: Total hrs.____ Total Jet ___.
7. Listed are various aeromedical conditions you may have experienced in your flying career. Please indicate which you have experienced, once (Col. A) or more than once (Col. B).

	A	B
Disorientation		
Dizziness		
Vertigo		
Fainting		
Blackout, G		
Blackout, Not G		
Hypoxia		
Hyperventilation		
Weakness		
Memory lapse		
Temporary panic		
Freeze on controls		
Severe heart pounding		
Heat stress		
Severe sweating		
Smelly oxygen		
Unusual cockpit odours		
Nausea		
Vomiting		
Diarrhoea		
Severe fatigue		
Memory lapse		
Forgetfulness		
Illogical action		
Inexplicable error		
Compelling drowsiness		
Illusions		
Severe pain, in:		
Arms and legs		
Stomach		
Sinus		
Ear		
Chest		
Eye		
Fever		
Chills		

8. From question 7, please circle the check marks for any conditions you have experienced in the past month.
9. From question 7, please state the condition which caused you the most concern for your safety and that of the aircraft _____.

   The month and year it happened was _____.
10. List those you reported to a Flight Surgeon or _____.

    NO. _____.
11. In 1965 did you take pills or drugs, other than Aspirin, just before or during flight? (No, once, sometimes, often).
12. Have you ever flown with a hangover? (No, once, sometimes, often).
13. Have you had haemhorroids? (Yes, no). Do you have them now? (Yes, no). If yes, (for years, recently). They are (mild, bothersome).
14. How well do you know your unit Flight Surgeon? (check mark one of the following).

    a. ( ) No Flight Surgeon.
    b. ( ) Don't know if there is a Flight Surgeon.
    c. ( ) By name or by sight only.
    d. ( ) Have met and talked with him.
    e. ( ) Have discussed aeromedical matters with him.

In 1966 a small survey was conducted among Canadian pilots to determine the incidence of aeromedical problems encountered in flight. Three hundred pilots received questionnaires which were to be answered voluntarily and mailed. The Institute of Aviation Medicine, which conducted the survey, recognized the limitations of such a survey both in scope and technique; they would have preferred to carry on a more elaborate in-depth survey by interviewing but staff limitations prevented this. Three out of four responded; the findings – although perhaps not too surprising to the pilots themselves – were of considerable interest to the doctors.

The questionnaire was printed on a standard air letter form and required only sealing and mailing. The pilot checkmarked the items, wrote in a few words, and mailed it.

The limited size of the form itself and the aimed-for simplicity precluded definitions of terms; thus, a pilot would have to use his own notions as to what was meant by Heat Stress or Severe Fatigue. Similarly, the word "hazardous" conjures up differing estimates of personal or aircraft jeopardy. (Ironically, it wasn't until the returned forms were being analyzed that the item "memory lapse" was discovered in two places!)

Tables I and II, show vertigo and disorientation to be the leading pilot problem. Only six pilots reported never to have had an aeromedical problem in flight. Hypoxia incidents were overly common; this was attributed to a possible inclusion of decompression chamber experience, but there was no way of establishing this.

In responding to the query about the condition which caused most concern for safety, vertigo and disorientation understandably stood at the top. In Table III, total

224 Canadian Forces Pilots
Types of Aeromedical Incident Experienced
During Their Flying Careers
Number of Pilots and Rate per 1000

Rank	Aeromedical Incident	Number of Pilots	Rate per 1000
1	Vertigo and Disorientation	183	817
2	Blackout - due to G	167	746
3	Nausea	82	366
4	Unusual Odours	79	353
5	Severe Pain - Sinus	76	339
6	Compelling Drowsiness	73	326
7	Temporary Panic	63	281
8½	Severe Sweating	61	272
8½	Severe Fatigue	61	272
10	Severe Pain - Ears	58	259
11	Memory Lapse	55	246
12	Smelly Oxygen	54	241
13	Hypoxia	49	219
14½	Heat Stress	43	192
14½	Vomiting	43	192
16	Illogical Action	35	156
17½	Severe Heart Pounding	33	147
17½	Diarrhoea	33	147
19½	Hyperventilation	32	143
19½	Inexplicable Error	32	143
21	Dizziness	26	116
22	Fever and Chills	21	94
23	Severe Pain - Stomach	18	80
24	Severe Pain - Arms and Legs	16	71
25	Illusions	13	58
26	Weakness	8	36
27	Severe Pain - Eye	6	27
28½	Fainting	5	22
28½	Severe Pain - Chest	5	22
30½	Blackout - not due to G	4	18
30½	Freeze on Controls	4	18
No Aeromedical Experience Reported		6	27

Table I

TEN LEADING CAUSES OF AEROMEDICAL INCIDENTS REPORTED BY 224 PILOTS AS HAVING OCCURRED SOMETIME DURING THEIR FLYING CAREER. RATE PER 1000

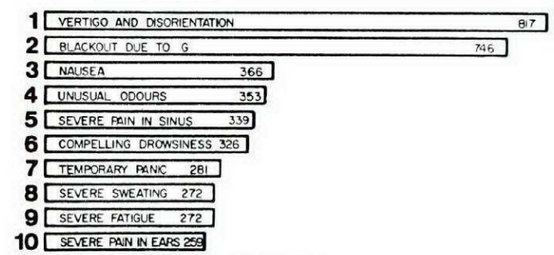


Table II

224 Canadian Forces Pilots
by Type of Episode Causing Most Concern for Safety
Total Experience and Experience During 1965

Type of Episode	Total Experience		Experience During 1965	
	Number of Pilots	Total Rate per 1,000	Number of Pilots	Annual Rate per 1,000
Vertigo and Disorientation	67	299	15	67
Severe Fatigue	20	89	7	31
Temporary Panic	13	58	5	22
Severe Pain - Sinus	13	58	2	9
Compelling Drowsiness	11	49	1	4
Blackout - due to G	7	31	0	-
Hypoxia	7	31	0	-
Severe Pain - Ear	6	27	3	13
Memory Lapse	6	27	1	4
Inexplicable Error	4	18	1	4
Dizziness	3	13	0	-
Hyperventilation	3	13	0	-
Severe Heart Pounding	3	13	1	4
Unusual Odours	3	13	0	-
Heat Stress	2	9	2	9
All Other Episodes	15	67	3	13
Total Response	183	817	41	183
Nil Response	41	183	183	817
Totals:	224	1,000	224	1,000

Table III

experience and experience during 1965 are compared. Pilots were asked to list those experiences considered dangerous which they had reported to a medical officer. Seventy percent of pilots who had experienced "dangerous" aeromedical problems did not report them to a medical officer. Further, there is no indication from the remainder that these experiences were discussed immediately with the medical officer.

Remarkably few pilots took drugs before, or during flight. Several of those who indicated that drugs were used reported that they did so under medical supervision.

224 Canadian Forces Pilots
Flying Experience with Hangovers
by Present Service Employment

Flying Experience With Hangovers	Flying Duties				Total	
	Annotated		Non-Annotated			
	Number	Percent	Number	Percent	Number	Percent
Never	33	23.4	17	20.5	50	22.3
Once	20	14.2	19	22.9	39	17.4
Sometimes	85	60.3	39	47.0	124	55.4
Often	3	2.1	8	9.6	11	4.9
Total:	141	100.0	83	100.0	224	100.0

Table IV

Table IV shows the incidence of flying with a hangover. Most significantly, 60.3% of pilots have flown with hangovers on several occasions at least, and that while proportionately more annotated flyers exposed themselves to flying with hangovers, the non-annotated group produced 9.6% who often did so. Two pilots in check-marking their response as "Once" added in writing "Never again!".

Of particular encouragement to the Institute was the response to the last question: How well do you know your flight surgeon? Over 80% of annotated pilots knew their flight surgeon and almost half of these had discussed aeromedical matters with him.

In summing up, the Institute reports that the response was encouraging and indicated "a fair degree of interest" in the survey. The original aim of the survey was to discover the extent of aeromedical problems experienced by pilots. "There can be little doubt that it markedly exceeds the more conservative estimates made prior to the survey. This is particularly true when one considers that the results do not reflect frequency exposure to each type of incidence for each pilot. However many times he might have experienced fatigue, for example, a pilot's fatigue experience was only recorded once."

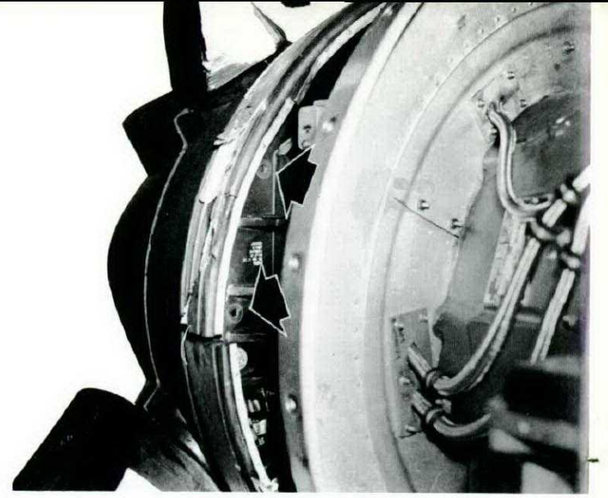
The report also calls attention to the "strong association" of vertigo and disorientation when flying with a hangover. Similarly, the incidence of fatigue and the associated compelling drowsiness should alert pilots to a potential aviation hazard.

From time to time fatal accidents occur in which hangover is a factor and occasionally alcohol is found in blood or tissue. The report relates the high danger of pilots flying with traces of alcohol in their system; "...hangovers should be regarded as a serious aeromedical problem, especially in the light of high exposure on the part of Canadian Forces pilots."

In short, the survey provides an invaluable insight for every pilot.

There is a limit . . .

Who's at fault here?



". . .After 28 hours in the most miserable sloppy weather conditions I've worked in, I went to bed."

At the end of a brief flight – the first after an engine change – the number four propeller was found badly damaged. Two bolts which probably had been installed partially to position the components, were never tightened and came loose in flight.

Earlier, on an overseas flight an engine had to be changed – and fast. At least this was the impression given to the maintenance crew and was supported by the supervisors. In response to this priority a crew worked beyond sensible physical limits to a deadline – a deadline ironically later destroyed by a maintenance error the haste had created.

Too few working stands, appalling weather, darkness and inadequate lighting, and job interruptions plagued this crew – but their story tells it more graphically:

". . .the engine change was carried out outdoors. Progress was slow, due to freezing rain which made the stands and ladders slippery. . . Throughout the engine change I assisted. . . with a minimum of work breaks, no breakfast or lunch so as to bring the engine change to the shortest possible time. . ."

". . .It was a miserable night. We had freezing rain all night and conditions were poor. . . By four o'clock it was very slippery around the aircraft and stand. We had the new engine in by approximately six in the morning. We were getting tired and should have gone to bed but I believe they wanted the aircraft right away so we kept on working. . ."

". . .it has been my experience in many other instances concerning work on aircraft that we are always required or expected to attempt to meet a deadline for departures regardless of the time involved with no consideration for the length of time personnel should be actually required to work to complete a task such as is allowed with other people, for example aircrew, who must take crew rests. . ."

"We started the engine change at 0030 when we came to work. As soon as we started the change it started to rain and freeze at the same time. This made the stands and the wings nearly impossible to walk on. The lighting was bad and the working conditions were horrible. . . We missed breakfast and worked until 12 noon. . ."

"On the 17th I was detailed to remain and assist with an engine change. . . We proceeded to disconnect the engine at approximately 0030 hrs on the 18th. Portable lights were used. It had started raining and shortly turned to sleet. The aircraft and the aerostands were very slippery and working conditions were extremely dangerous. . . There was considerable difficulty encountered with the portable engine stand. . . I had no breakfast or lunch because we were anxious to finish the job. When the engine change was completed I asked the flight engineers to do the ground run. . . I felt that after working 27 hrs, I was not mentally alert enough to do the ground run. . . After 28 hrs in the most miserable sloppy weather conditions I've worked in, I went to bed."

On the Dials

In this column we hope to spread a little new gen and try to answer your questions.

And we do get questions. Our staff members in their travels are often faced with, "Hey, you're a UICP, what about such-and-such?" Rarely is it a problem that can be answered out of hand. If it were that easy the question wouldn't have been asked in the first place. The required answer is often found only after some research and consultation. Also, often the follow-up of a particular question reveals aspects which would be of general interest to all airframe jockeys. We hope to answer this type of question, and any can of worms opened up in the process can be sorted out for everyone's edification.

Any questions, suggestions, or rebuttals will be happily entertained and if not answered in print we shall attempt to give a personal answer. Please direct any communications to the Commander, CANFORBASE Winnipeg, Westwin, Manitoba, Attention: UICP Flight.

Position Reporting - IFR and VFR

IFR

In the past couple of years there have been a number of changes regarding the requirements in aircraft position reporting procedures. These changes have come about primarily because of improved communications and extension of radar coverage. Direct pilot-to-controller communication is in common use and is being expanded through the use of PAL stations.

General guidelines for PX-ing are spelled out in CFP 100 and on the back cover of GPH 205 (that little grey book) but these two pubs haven't quite caught up to the latest developments. For instance, we still hear pilots saying "IFR flight plan" in their PX when talking directly to Centre. This is unnecessary. They know if you are IFR or CVFR. This expression should be used only when passing the PX to some facility other than ATC. And whenever possible pass the IFR or CVFR PX directly to ATC through pilot-to-controller channels.

"Radar contact" is an expression heard more and more. In the USA the expression means more than just that; it means that no further position reports are required – period. As long as you remain under "radar contact", all you do is acknowledge clearances, instructions, information, etc.

Another point – when making your initial call to a USA FAA ARTC, you must give your position (or ETA to the next reporting point) and your altitude/flight level. You do not establish contact first and then give this information. This is spelled out for you in Special Notices USA in GPH 205.

When handed over from one frequency to another within one ARTC, or handed over from one ARTC to another ARTC, the requirement is simply to give your identification and your altitude/flight level on the initial call.

Two examples might help. Winnipeg Centre advises you to "Contact Minneapolis Centre on _____ frequency". You change over and call: "Minneapolis Centre, Canadian Air Force 321, estimating Sault St Marie at 46, flight level 250, over." He will normally answer, ask you to squawk ident, advise "radar contact" – and that's it. Halfway across the lake, he will advise you to "contact Minneapolis on (another) frequency." You say "321", change frequencies and call: "Minneapolis centre, Canadian Air Force 321, flight level 250, over." Centre will reply "Roger 321, Radar Contact". You do not PX over the Soo.

DOT is slowly moving in this direction and you often hear "no further position reports required". DOT has also requested, through Class II Notam 4/67, that pilots "state their altitude upon initial contact on any ATC frequency."

VFR

VFR flights do not require position reports. However, for your own protection, you should PX whenever possible. VFR PXs should normally be passed to a DOT aeradio station rather than directly to ATC.

CVFR requires PXs exactly as for IFR and should be passed to ATC.

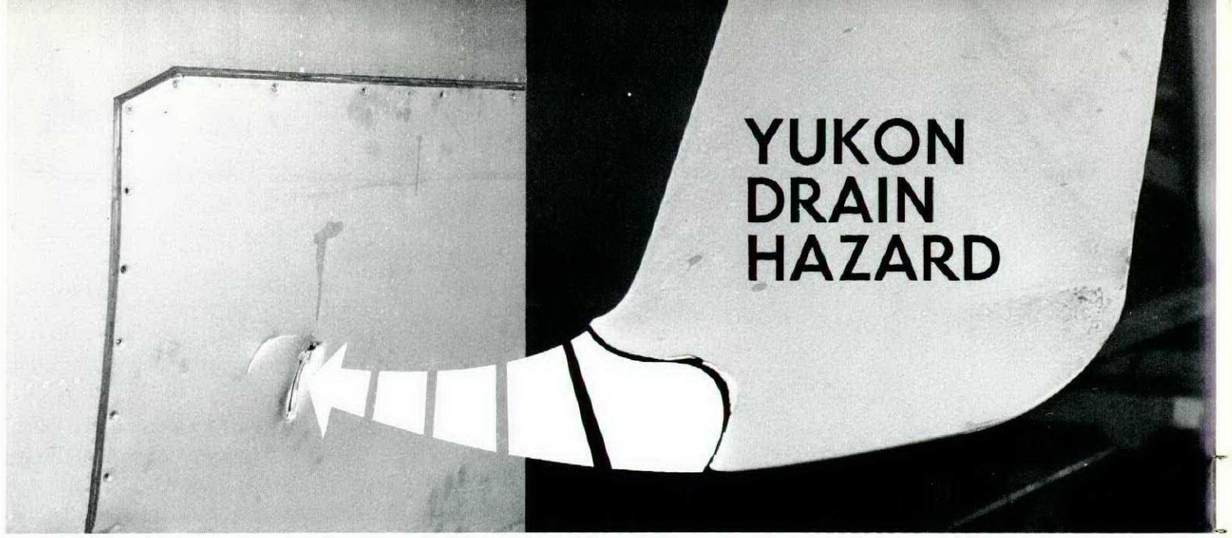
Remember, keep it brief and to the point. Read back only clearances (altitudes, routings and clearance limits), and acknowledge all information such as frequencies, squawks, weather, etc.

We recommend that you all have a look-see at DOT Class II Notam 4/67 on Air Traffic Control Procedures. This NOTAM should be held at your Flight Planning Centre.

FOOD FACT

The D/Base Surgeon advised that food poisoning is normally caused by the ingredients of a lunch and seldom by the handlers. As a precaution against simultaneous poisoning of the aircraft crew he recommended that at least one lunch containing a completely different menu be available for the captain or the co-pilot. The BFoodO forsaw no difficulty in providing such a lunch as long as the kitchen is informed of the requirement.

– Flight Safety Committee minutes



YUKON DRAIN HAZARD

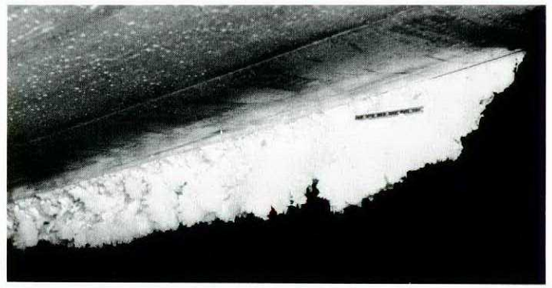
At 25,000 feet a loud bang shook the aircraft. The left inboard engine began to malfunction and was shut down. Something had struck the prop – but at 25,000 feet?

A substantial hunk of metal was missing from one of the propeller blades and another blade was badly bent. The 3-inch square piece which broke off penetrated the fuselage just below the main cabin floor. Fortunately, the internal bracing of the aircraft absorbed the impact of the prop tip; it could have entered the main cabin and injured a passenger.

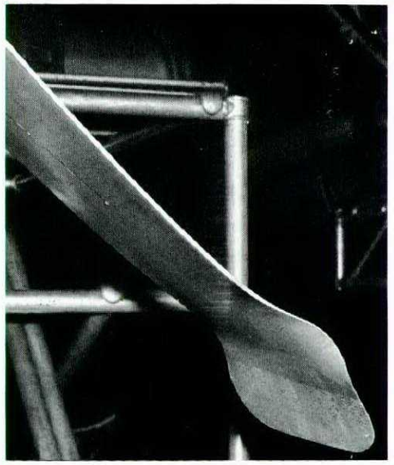
The mystery was soon cleared up. Ice from the forward washroom drain had struck the number 2 propeller. A project was quickly underway to determine whether a new-design drain being prototyped would prevent the build-up. Test flights with the new drain proved that ice accretion was still dangerous; in fact, an engine had to be shut down on one of the flights to prevent possible damage to the propeller.

Out of the test flights came these observations:

- The unmodified drain left a film of ice on an area 1 to 2 feet in width extending rearward along the forward fuselage, the leading edge of the wing root, the underside of the wing near the root, the aft fuselage and horizontal stabilizer near the root. Ice built up immediately behind the drain and took the form of a single block of ice estimated to be 5 to 6 feet in length, 12 inches wide at its widest point and 3 inches thick. After a time, the ice build-up covered the drain and stopped the flow.
- With the modified drain, the ice formed in irregular patterns scattered along the fuselage. These patches were 10 to 12 inches in diameter and up to 8 inches thick. The most forward chunk was the largest. On the test flight several chunks were observed separating from the aircraft. They moved well away from the fuselage and were suspected to have passed through the plane of rotation of number 2 propeller.



Extensive build-up with unmodified drain.



Ice chunk broke free, bending prop.

- Ice build-up was slow at first but the initial film of ice would promote rapid build-up if water dumping was continued.
- Galley drain heating had no noticeable effect on ice formation at any time.

With ice accretion behind the modified galley drain still presenting a hazard to flight and possibly to persons and property on the ground the investigation will continue to determine if further improvement can be achieved to eliminate this hazard.

Bulletin Board Biblicism

THOU SHALT NOT TAKE TO THE HEAVENS OVER THE NEAR BARRIER IN THINE IRON BIRD FOR FEAR THAT THE CABLE WILL TANGLE THEE.

LIKEWISE, THOU SHALT NOT DESCEND TO EARTH BEFORE THE NEAR BARRIER IN THINE IRON BIRD FOR FEAR THAT THE CABLE WILL TANGLE THEE.

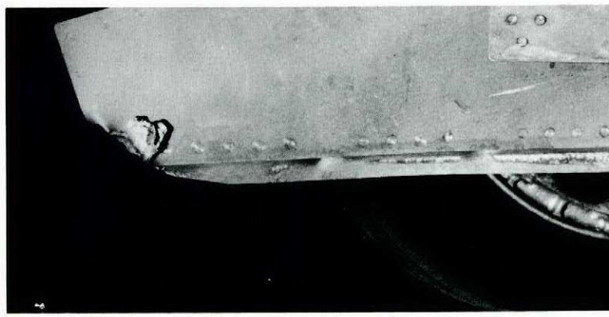
THOU SHALT NOT COAX THINE IRON BIRD OVER THE FAR BARRIER HASTILY (MAX 10 mph) LEST THE CABLE TANGLE THEE AND RUFFLE THE LEG COVERS OF THINE IRON BIRD.

Take ye good heed then, beloved brethern (all pilots), unto the teachings of the great book – ADCIs 2.04/10 para 3(c) and para 5. For whosoever heedeth not the commandments contained therein shall surely incur the wrath of the Great Master (Commander ADC), and of the Disciple of the Great Master (Base Commander). And it shall come to pass that the Great Master will smite thee with fear, and with debt, and astonishment of heart. And thou shalt not prosper in thy ways... AMEN

Snatched (with due reverence) from a bulletin board

Cable Dings Iron Bird

At the behest of the man in the tower the T33 captain exited the runway faster than normally, crossing a cable fast enough to damage the undercarriage door.



CLOSE CALL · OPERATIONAL HAZARD · SAFETY SUGGESTION

SAFETY COMMENT

YIPES!

Recently a CF104 pilot carried out a Tacan letdown to minimums only to find, when he broke out below the overcast, he was miles from where he should have been. Ground radar was unable to pick him up.

He had neglected to select TACAN position on the PHI selector and had done the letdown without Tacan selected. Other CF104 pilots, it seems, have made this error but they have failed to write it up or report it as a close call.

It's a deadly kind of silence when an account of your error might save a life. Write it up and pin it down!

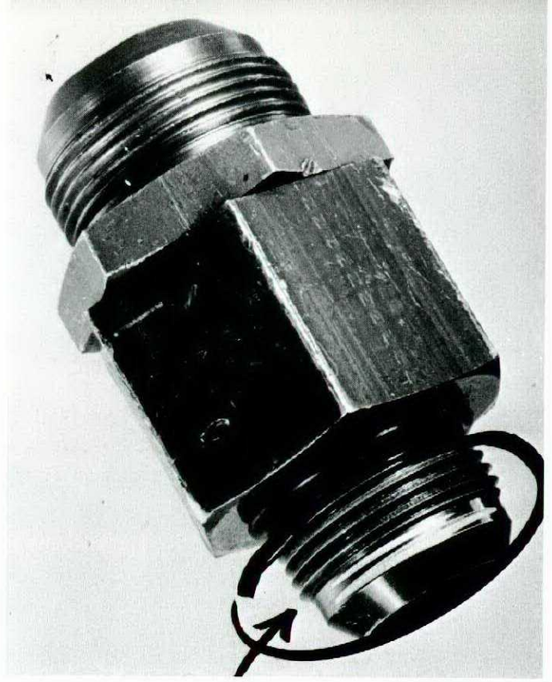
From AIB files

Same Part - Same Pilot!

An item from AIB Files column in the Nov/Dec 65 issue described how a CH113 pilot, F/L Hayes, had experienced fluctuation in the aft transmission oil pressure while over water and had pulled off a real squeaker by quickly landing at the nearest place on shore. At the rate the aft transmission was losing oil, F/L Hayes had only four minutes more oil before possible transmission seizure and almost certain loss of the aircraft and crew.

Over a year and a half later F/L Hayes was at the controls when he experienced an identical rapid fluctuation of the aft transmission oil pressure. He promptly set the aircraft down at an airport nearby. What came out of the investigation was embarrassing evidence that in the intervening period we had not been able to get a satisfactory fix to this extreme flight safety hazard.

The report came in, bearing a photograph of the same part which had malfunctioned previously – for the same reason. Working from a message rather than a -6A Mod leaflet an experienced technician had re-installed a part which should have been replaced. The error was further compounded by his supervisor failing to notice the error; he had trusted this man to do what appeared to be a relatively uncomplicated task. It was the lack of any reference to surplus or obsolete parts resulting from the job that did not alert both persons to the error.



BRAKE... or BREAK

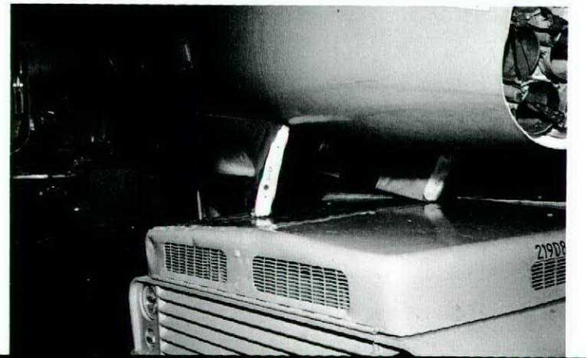
The Base Commander observed, "it is fortunate that this failure occurred in relatively safe surroundings for had it occurred on board it might easily have resulted in loss of life."

The occurrence at first glance, appeared to be straightforward. The mule had described a maximum-rate turn into the aircraft smashing the undercarriage doors.

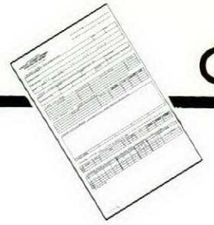
The driver maintained that he had applied the brakes but they had failed to work. Later, an inspection of the brake system showed why.

First, the brake fluid in the hydraulic cylinder was low. The system was leaking fluid from a brakeline to the left rear wheel cylinder. This line – ordinarily steel for safety – had been replaced at an unknown time by an aluminum brakeline. Very susceptible to salt corrosion this line had deteriorated and begun leaking. Periodic inspections of the vehicle failed to uncover the mistake.

Further investigation uncovered one more unsettling item: on the opposite wheel was one of copper alloy!



Gen from Two-Ten



TRACKER, MAN INJURED Despite a squadron technical order requiring the long-range fuel tank to be drained prior to removal, the man in charge of a crew of three contented himself with "tapping the underside of the tank with a screwdriver and listening to the ensuing noise". (There is no contents gauge.) He further checked by pushing the water trap drain and seeing that no fuel emitted, assumed the tank to be empty.

He stationed two men at the tank nose and one at the rear. The tank was released and promptly fell on its rear end surprising the two men in front with the unexpected weight. They were unable to hold the tank and dropped it onto another man's ankle. The injured man got away with a severe bruising.

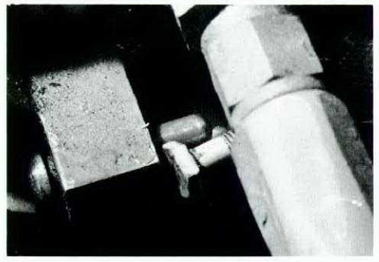
Weapon handling equipment will be used in future just in case someone gets careless again.

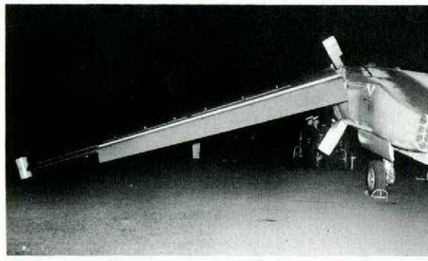
TRACKER, VALVE MISALIGNED On a functional check the technician selected wing spread, whereupon the two wings unfolded correctly until the starboard wing was in the locked position. At that moment a crunching sound came from the port wing. The wing continued in its unfolding cycle past the horizontal and came gently to rest, wingtip on the ground.

Earlier, two men had removed and reinstalled the port wing fold lock cylinder sequence valve. Neither the two technicians or the supervisor checked the final position of the lock sequence valve adjustment bolt for correct alignment. (Its misalignment can be seen in photograph).

That the component itself is capable of being installed misaligned is regrettable (this is not the first time) but it should dictate extreme caution on the part of those servicing it.

This error has occurred every two years for the past 10 years.



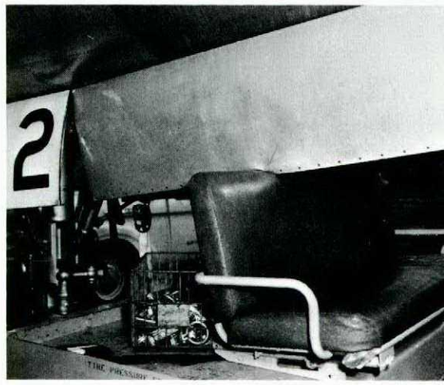


YUKON, FAULTY TIE-DOWN Tying down the Yukon nose to a mule during loading operations had become an SOP – that is, until this occurrence. The correct method is to employ tie-down rings embedded in the tarmac; however, there were too few of these – and so the mule tie-down technique.

The system worked until a mule of different proportions was used one day. The new-style D6 seen in the photograph has a higher seat back. As the aircraft was loaded the nose-wheel oleo compressed crushing the gear doors into the top of the mule seat back.

The requirement to tie down the nose of the aircraft during loading was never made known to the maintenance staff. Too, there is no information available in engineering orders. To create a further hazard the cross-member to which the tie-down strapping was attached is not stressed to be loaded in this manner.

New tie-down fittings are underway, as are more tie-down rings. In future tie-downs will be attached to the jacking points on the aircraft which are capable of taking the strain.



ALBATROSS, SEA DAMAGE After landing in the open sea to investigate what appeared to be the wreckage of a small boat – the subject of their search mission – the aircraft was taxied away from the shoreline for takeoff. The captain judged the swell conditions on the open water to be "of a minor nature" – an ideal opportunity for his first officer to practise an open-sea takeoff.

The first attempt was aborted as a porpoise developed; four takeoff runs in all were attempted, each developing into a porpoise. During a

security check following the last takeoff attempt the starboard drop tank was noted to be missing. This left an unbalanced fuel state making it necessary to transfer the fuel remaining in the other drop to an inboard tank. During the thirty minutes it took to transfer the fuel the aircraft was taxied to a sheltered area and a normal smooth takeoff was made from a bay.

Forty minutes later while flying straight and level, the port drop tank dropped off the aircraft. After landing, the crew noted some fabric inspection patches were missing from the elevators. These were taped and the aircraft returned to the search, flying for nearly four hours before returning to base.

The aircraft was damaged in eight areas including extensive rippling to the hull, fuselage, stabilizer, and elevator. The captain feels that the damage to this aircraft was not necessarily the result of these takeoff attempts in the open water but could have resulted from the accumulation of stresses given to this type of aircraft in normal operations.

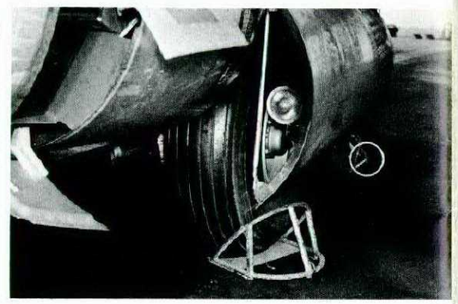
By definition (AOI), open sea operations are "hazardous". In this instance there was little justification for actually landing the aircraft; a rescue boat was nearby. Open water operations with full drop tanks are not permitted.

The captain, despite his good intentions, should not have considered an operational mission as an opportunity to train his first officer in open sea operations. Actually, the first officer required further formal training to qualify him for open sea work.

These aircraft are often exposed to the severe loads imposed on them by operating off water. This fact dictates treating these aircraft with a great deal of respect – and caution.

HERCULES, U/S CHOCKS The aircraft was towed to position on the ramp following off loading and refuelling. Soon after, the aircraft began to roll forward. Frantically a man rushed toward the cockpit to apply brakes and another attempted to insert a chock in front of the main wheel. The aircraft came to a halt after striking a ground power unit, damaging the fuselage.

What came to light as a result of this occurrence is seen starkly in the photograph. The chock on the rear wheel is a Yukon type; a missing shoe (circled) renders this one u/s. The chock on the front wheel – sitting askew from being pushed aside – is an original C119 chock. Of the three shoes fitted to the forward frame, two are missing.



Looks like using incorrect, unserviceable chocks to hold aircraft on a sloping ramp was asking for trouble.

Comments to the editor

I have a question regarding Safety Equipment that may not be within what you had intended as the scope of the "You ask.... We answer" section of your fine magazine, but I have not been able to come up with authoritative answer from any other source available to us in Europe. I would like to know the minimum altitude that a safe ejection could be expected from a CF104 on a straight-in final approach (190 kts - 1000 fpm down) if there was no decrease in rate of descent prior to initiating the ejection sequence.

W/C RM Edwards
1 Wing

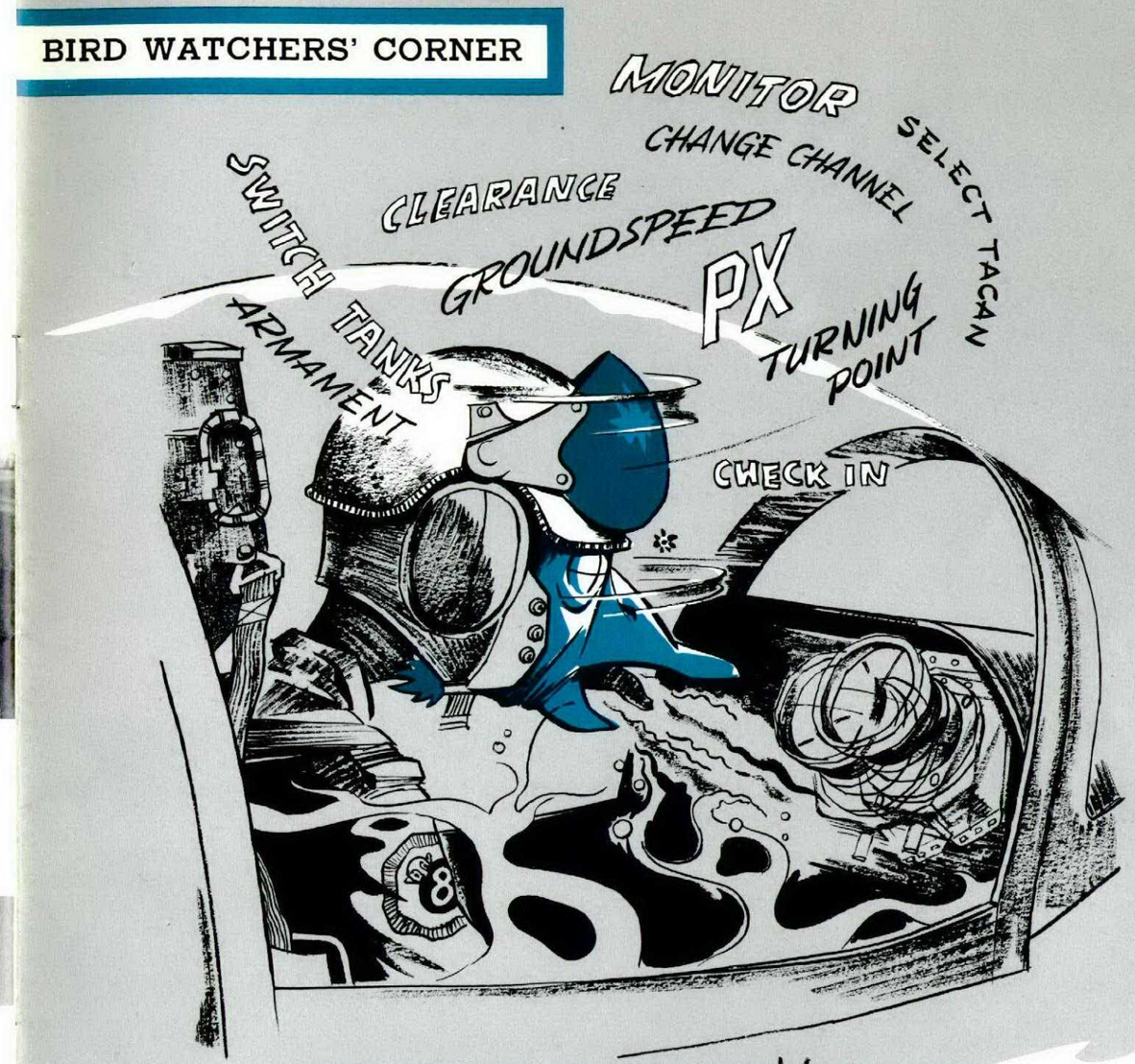
The safety equipment people state that the seat will be okay to ground level, ie, you will be in a safe landing configuration from a straight-in approach as you described. At 190 knots, 1000 fpm down will give you about 3° descent angle. If you ejected at ground level you would achieve full parachute deployment 20 feet in the air; it would be close, but safe. Your command Staff Officer Flight Safety has the charts which show flight paths, etc.

Hand Signals

Non-standard hand signals have led to cases of misunderstanding between aircrew and groundcrew. The NATO system should be used exclusively.

– Flight Safety Committee minutes

BIRD WATCHERS' CORNER



GRUBLESS STARVELING

The distinctive airborne antics of Hypoglycemia Ravenus are rather curious. Inexplicable lapses of attention, a befuddled memory and slowness of response, impart to the Starling's flight an erratic quality that is a bird watcher's wonder. Grubless, who has no stomach for birds who put food before flying, keenly takes to the blue—and fast! But once aloft, his perplexity and consternation rises as blood sugar drops. Between his ears, a less-than-efficient computer slows and falters. Fumes from an empty tank—the acidic aftermath of a past repast—burp upwards, punctuating his characteristic cry:

MYFLYING'SABOMINABLE(urp)AND THE REASON'SABDOMINAL

TOOLS!

Tools were found in the wreckage of five of the last eight crashes! In two of these, tools were strongly suspected as the cause of the accident . . . BEWARE!

TOOLS
W