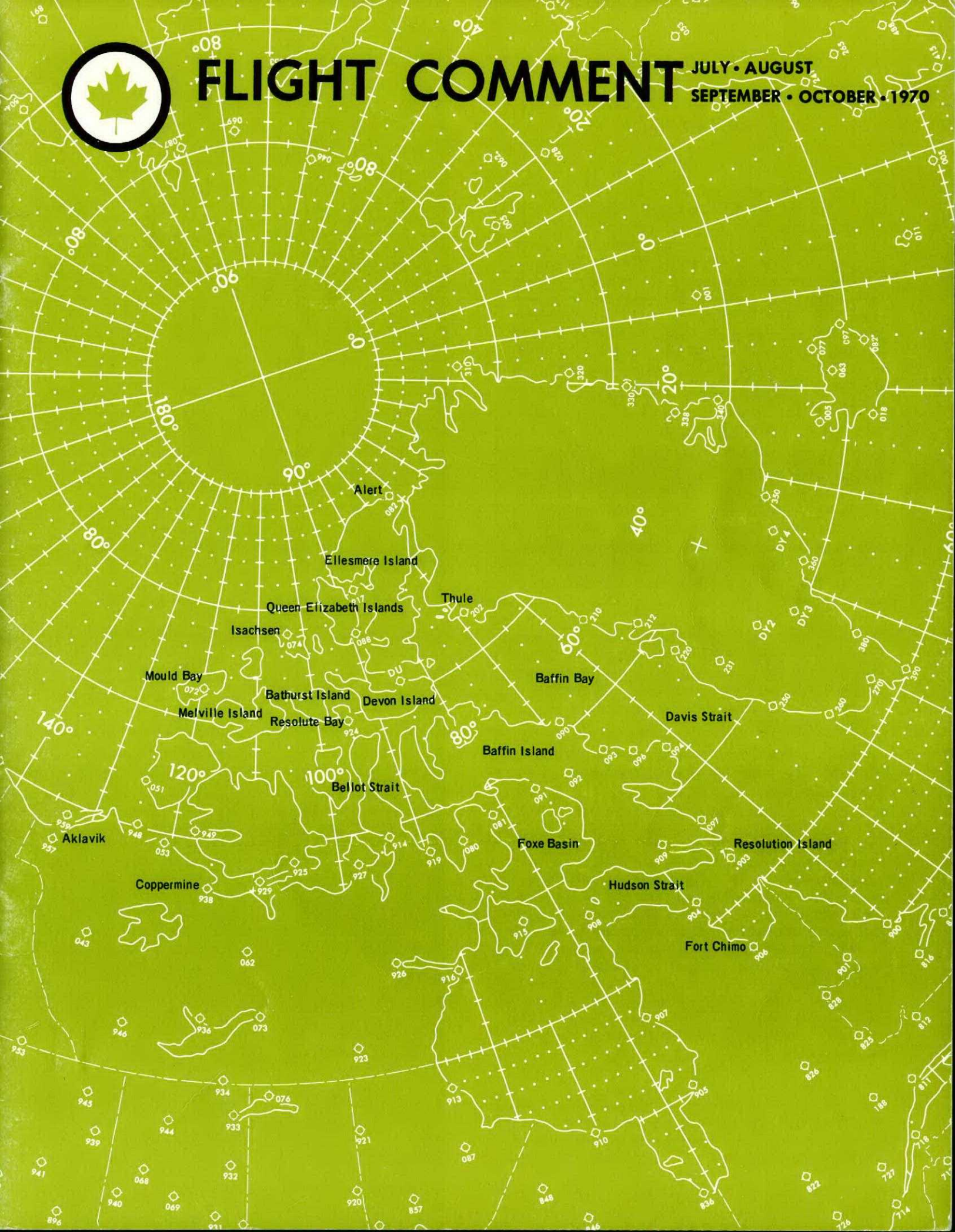
FLIGHT COMMENT

JULY • AUGUST
SEPTEMBER • OCTOBER • 1970



Comments

A letter to the editor of USN Approach (June 70) has overtones for CF personnel associated with parachute water-entry training. The writer suggests that more aircrew are lost after parachute water landings due to problems related to being tangled in a chute, than are dragged by the wind. Meanwhile the emphasis in training continues to be on the latter. "Nowhere," he points out, "is the aviator given the experience of trying to release himself from his chute with a seat pan dragging him under water, the chute and shroud lines loose and tangled about him, and unable to feel anything because he is wearing gloves."

A physiological incident (in another service) was subsequently traced to cockpit fumes from an overheated potting compound. When the compound was test-burned at a laboratory one of the investigators found his vision impaired - he was unable to focus clearly on nearby objects although distant objects were clear. These symptoms were identical to the pilot's, and use of the compound is under further investigation.

During a refuelling stop, a T33 pilot signed off a fuel leak in the S/B area as "accepted enroute base – destination base for repairs". At destination (fortunately he arrived safely) he placed the aircraft u/s and disappeared. Over the weekend, repair crews not only located and repaired the fuel leak, but rectified several other unserviceabilities as well. All told they spent 29 maintenance hours - on a *transient* aircraft.

One popular pastime in the field consists of complaining loudly about the delay at CFHQ in replying to correspondence. This is accompanied by the notion that in fact it frequently becomes lost in the headshed. While this may actually happen on occasion, the suspicions held by some people here, that the correspondence in question is frequently mis-directed, seems well justified, judging by the addresses on some FS poster requests reaching DFS. The recently distributed poster catalogue shown on the back cover of this issue, in addition to containing most of the presently available posters, tells where to direct requests.

The Gen from Two-Ten item, CF101, STRUCK TOWING TRACTOR (May/Jun 70), should have mentioned in its summary of contributing factors that the aircraft had a low starboard oleo.

CANADIAN FORCES HEADQUARTERS
DIRECTORATE OF FLIGHT SAFETY

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DIRECTOR OF FLIGHT SAFETY

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LCOL W. W. GARNER
Investigation and prevention

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Attitude (±)

In the military there are many expressions used to indicate attitude, such as morale, dedication, determination, pride of accomplishment, and so on. Call it anything you like, but accept and remember the fact that attitude plays a very big part in how well any job gets done. More specifically in the accident prevention business a positive attitude is absolutely essential to the continued success of any program.

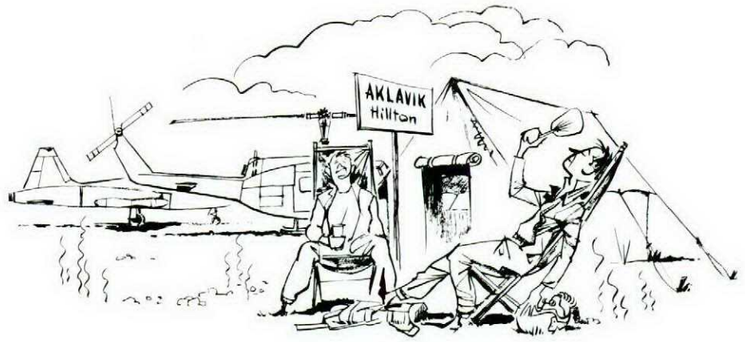
I wouldn't be stating the obvious if there weren't indications that some people still think that the flight safety organization is not an integral part of the air operations team. Even worse, there is the odd individual who considers that accident prevention is also mission prevention. Nothing could be further from the truth and fortunately such negative attitudes have all but disappeared.

Still not convinced? - then let me assure you once again that there is no place for indifference, complacency or carelessness in air operations. We are concerned with every facet of the operation and every level of involvement is considered important. We do not ignore or overlook the so-called simple matters because experience has shown us that more often than not the insignificant detail makes the difference between success and failure. If you can say the same then you have a professional outlook and your attitude must be positive; if not, then it is time to take stock.

COL R. D. SCHULTZ
DIRECTOR OF FLIGHT SAFETY

90°F in Aklavik?

Wx factors in the Summer Arctic



Mr. J. Cote´
Meteorologist
CFB Uplands

As the warm summer months make us forget the backaches and the numb fingers of the last winter blizzard, we balk at the suggestion of Arctic operations.

The reaction is quite normal, but the fact remains that the increased interest in our Canadian Northland, especially in the past year, has brought about a greater awareness of the need to protect and develop this long neglected land.

The super tanker Manhattan is still much in the news with its pioneering effort across the Canadian Archipelago. Such an operation through the treacherous northern waters was made possible only after much study and planning. Flying over the Arctic region might not be as spectacular as water navigation there, nevertheless, it also requires careful planning. Having pilots understand and foresee the major flying hazards peculiar to the Arctic region is part of that planning. For this reason a general knowledge of the Arctic environment is a must - particularly the Arctic summer.

"A land of eternal ice and snow, a land of everlasting winter with intense cold." This statement expresses one of the most common misconceptions of the Arctic; it most probably evolved from the climatic description by those early explorers stressing the dark and rigorous aspects of the Canadian Arctic. In the last few decades, particularly as a result of continuous observations from an expanding network of stations, a great wealth of new knowledge has been made available to dispel misconceptions.

Contrary to what was often assumed in the early decades of this century, it has been firmly established that the fundamental processes shaping the weather and climate of the Arctic region, far from being unique, are exactly the same processes affecting the regions in mid-latitudes. The extent to which major factors such as latitude, distribution of land and water and general features of the atmospheric circulation, apply to the Arctic region is a question that must be considered to understand the climate or weather of the Canadian Arctic. This is particularly true if one is to understand the weather problems of the summer months.

LATITUDE

The far north location is of prime importance, since it is responsible not only for the extreme annual range of daylight but also for the low angle at which the sun's rays strike the earth.

The lack of solar radiation during the long Arctic night of the winter months results in sustained cooling of the snow and ice surfaces. It is interesting to note that although a climate of prolonged and severe cold is characteristic of the Arctic region, some of the coldest temperatures on record in the northern hemisphere are found not in the Arctic (-55° to-60°F) but in the sub-Arctic latitudes (-81° at Snag, Yukon and the -70° to -75°F reported from some of the western provinces and Ontario).

In the summer months, despite continuous daylight, the solar energy reaching the area is greatly reduced because of the low angle of the sun's rays, the high reflectivity of the ice and water surfaces and the extensive cloud cover. In fact the Arctic loses more heat to space than it receives from the sun.

Temperatures begin rising in March, climb more rapidly in April and reach a maximum in July in almost all regions. At this time mean daily temperatures range from near freezing over the pack ice and the ice-water to 40-45°F along the coasts of the islands. Only occasionally over the larger southern islands does the temperature exceed 65°F during brief periods of sunny weather.

At coastal locations temperatures may be expected to drop to within a few degrees of the freezing point whenever onshore winds occur, although when winds are off the land, 45° to 50°F readings are more likely. Temperatures have reached 90°F at such mainland settlements as Aklavik, Coppermine and Fort Chimo. Over the islands of the Archipelago, however, extreme maximum temperatures are not as high, ranging from 75°F in the south to mid-60° readings in the north.

ATMOSPHERIC CIRCULATION

To make up the annual deficit, heat is transported into the Arctic region usually via the upper levels of the atmosphere. To compensate, the cold Arctic air will, in turn, penetrate south over the continent. These cold outbreaks, well known to Canadians, occur sporadically in the wake of low pressure centres which for almost eight months of the year travel along the southern edge of the cold air.

From November to May, the circulation is characized by a general northwest-to-southeast flow over the the Archipelago, a high pressure area over the Mackenzie valley, the Arctic Ocean and the western islands. The Icelandic low to the east with its Baffin Bay Trough reflects the frequent cyclonic activities in that region.

During spring and summer, usually starting in June, there is a pronounced change in the circulation resulting in a relatively weak pressure gradient and a sluggish average flow. The main features of the average circulation during the June to August period are a weak low pressure area over the Arctic Ocean, reflecting the alternating influence of low and high pressure areas. and the more prominent low at the south end of Baffin Island, an area of high cyclonic frequency. Through this period surface lows show a marked displacement northward in their track over North America with the Prairie provinces having the highest frequency of cyclonic activity in the Northern Hemisphere. Their influence is often felt in the Arctic region particularly in the Davis Strait - Baffin Bay area. Some storms will move through the Arctic as well, either from the Arctic areas or along the continental coast where summer frontal developments occur due to strong temperature contrasts between land and ice. In fact, such summer storms bring the heaviest precipitation to the Arctic Ocean.

LAND AND WATER DISTRIBUTION

Atmospheric circulation is mainly responsible for the year to year variations in climate, while land and water distribution, the relief of the land and the ice cover account for the difference in the climate from one location to another.

The Canadian Arctic Archipelago has been called the "largest collection of islands and the most complex arrangement of inlets and channels in the world". When the ice cover is gone the maritime influence of these waters accounts for many of the weather problems encountered in the summer and autumn. Much of the land is low and flat, offering little obstruction to the free atmospheric flow between the middle latitude and the Arctic. The only areas of significant elevation - apart from Greenland and the Brooks and Alaska ranges - are the mountainous eastern islands of the Archipelago. This 5000-foot, ice-capped barrier causes local increased precipitation along the coasts of Baffin, Devon and Ellesmere Islands.

ICE

One of the entirely unique features of the Arctic is the almost complete coverage of the Arctic waters by ice during some parts of the year. The main body of the Arctic Ocean is, of course, covered year round with pack (permanent) ice (90% in winter and 70 to 80% in summer) continually on the move.

For more than half the year (November to June) the Arctic waters are covered with ice and thus the region is subjected to a "continental" type climate. Maximum ice coverage usually occurs in late April or early May at which time the Polar Ice Cap extends south to 60°N everywhere except in the North Atlantic region. During this period, open patches occur in Baffin Bay, Davis Strait, Lancaster Sound, Hudson Strait, Fox Basin, and smaller channels with strong currents such as Bellot Strait, Hell Gate and Cardigan Strait. Frequently, due to offshore winds prevailing for a few days, shore leads will appear from Bank Island to the northwest tip of Ellesmere Island.

Break-up begins in May or June with the advent of long hours of sunlight and warmer winds. Minimum ice cover generally occurs in late August or early September at which time areas of virtually no break-up generally are confined to the extreme north and northwest of the Arctic Islands (the waters north of Melville and Bathurst Islands). In a reasonably "open year", areas of completely ice-free waters include Hudson Bay and Strait, Lancaster Sound, Baffin Bay and Davis Strait and the large inlets of North Baffin Island. The balance of the Arctic waters retain some proportion of floating pack ice. As a rule the amount and duration of ice cover varies considerably during the summer, increasing from the southeast to the northwest.

The importance of the maritime influence during the "open water" season which normally lasts from July to November cannot be overstressed. The effect is particularly pronounced along all coastlines and over small islands.

CLOUDS AND FOG

In contrast with the winter, summer in the Arctic is the cloudy season. In a year cycle, cloud amounts vary from a minimum in the winter to a maximum in the late summer and early autumn, at which time coverage becomes more wide spread and exceeds that occurring anywhere on the continent at any time.

It is not uncommon to have most of the Arctic Ocean and the Archipelago blanketed by the same continuous layer of low-lying stratus clouds which is by far the most frequent type of cloud observed. At times like this, no one could challenge the reputation often given the Arctic of a dull and monotonous environment.

While the water-logged lands and cold partially ice-covered waterways add sufficient moisture to the air to create extensive low-lying clouds and fog-banks, convective currents developing over land frequently result in an increased proportion of stratocumulus in the southern areas of the Arctic. Cumulus clouds often develop over

the mainland and occasionally over the larger islands but only rarely will they reach the thunderstorm stage.

Of course, middle and high clouds associated with cyclonic disturbances do appear in the Arctic skies during the summer season, but their relatively infrequent occurrence makes them far less important than stratus clouds. Nevertheless, the presence of these clouds can add significantly to the total cloud coverage in regions such as the Hudson Strait. Because of the almost continuous presence of low pressure systems, this area has one of the highest incidences of cloud cover in Canada.

Advection fog is one of the most common hazards for pilots during the summer. Occurring frequently and extensively over the Arctic Basin, it forms as a result of warm air advecting over melting ice and cold water. Over the Arctic Ocean, as many as 25 days of fog have been recorded in the month of July. Most Arctic stations, with the exception of mainland and sheltered island locations, usually report 6 to 8 days of fog each month during the summer. Stations along Hudson Strait have the greatest number; Resolution Island reports fog fifty per cent of the time. At Resolute, Mould Bay and Isachsen and at most other coastal stations ceilings are less than 1000 feet or visibilities less than three miles, or both, almost 30 per cent of the time during this period.

The chance of advection fog is present until freeze-up. It usually disappears over the Arctic Ocean and northern islands in September but persists till October in the southern islands, often till late November along the south east coast of Beaufort Sea and till December in Hudson Bay.

Upslope fog, produced when warm moist air is cooled by lift, is also a common phenomena, but usually does not penetrate more than 30 miles inland. Radiation fog may occur when the sun is low on the northern horizon, however it is usually quite thin and of no significance.

PRECIPITATION

Although frequent cloudiness and great amounts of fog are typical of this period, precipitation in the Arctic averages less than ten inches in a year. Four inches or less is generally the rule over most of the Arctic Ocean and the northern part of the Canadian Archipelago. As a matter of fact, the region could be classified as a desert or semi-desert if it were located in a more southerly latitude. Most of the precipitation occurs in the summer (June to September) in the form of light rain - which could be better described as drizzle. July and August are usually the wettest months of the year with monthly rainfall totalling two inches in southern sections, decreasing northward to less than one inch over the Queen Elizabeth Islands. Freezing rain or drizzle can occur, but it is infrequent (less than ten hours per year) during the summer months while small amounts of snow may be expected in July and August over much of the Polar Basin.

ICING

Aircraft icing poses not nearly as serious a problem for pilots as it does in the more temperate regions where moisture content of the air is much greater. Nevertheless, prolonged flight in stratus clouds or freezing precipitation can result in serious icing since the freezing level frequently coincides with the level of the stratus cloud.

WINDS

Much could be said about surface winds in the Arctic but generally, with perhaps the exception of the Hudson Bay - Hudson Strait area, winds at most Arctic stations are no stronger than those in more southern latitudes. Because of low temperatures, the chilling effect of these winds is certainly more pronounced, but the "howling" winds, contrary to general belief, are not of general occurrence.

Even though light winds predominate over most of the Arctic (8 to 10 mph), high winds may occur and persist for periods of one to three days. These high winds are generally associated with strong pressure gradient, and may often occur due to the effect of rugged coastlines and valleys. At Thule, for example the air descending from the Greenland icecap will frequently create a local strong wind, often in excess of 80 miles an hour. Hourly wind speeds have exceeded 60 to 70 miles an hour at most locations, and several stations along the exposed eastern flank of Baffin Island have reported winds of 100 miles an hour. Each year, Resolute, Thule and Alert have a fairly high frequency of gales (29, 28 and 25 respectively) although the majority of these gales occur during the stormy season (September - November) and winter.

THE STORMY SEASON

When September arrives the return of the cold weather becomes imminent. In contrast with more southern latitudes, the period from September to November is the stormiest of the year in the Arctic. Low pressure areas continue to move through the region, each followed by a progressively colder outbreak from the Polar areas. The greater portion of the 20-to-50 inch annual snowfall occurs during these months. Turbulence and rather severe icing may be encountered by pilots flying in the low lying clouds. While fogs are less frequent than in July and August, visibilities are lowered appreciably in snow storms. Blowing snow and "white-outs" frequently hamper air operations during this period.

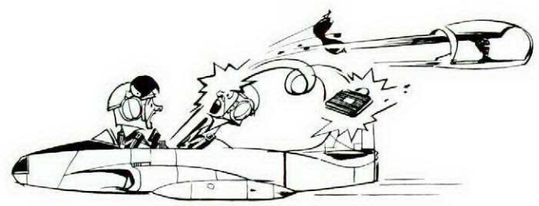
As ice-cover increases in the seas and bays and open water is no longer a major cloud-producing factor, the region takes on a very cold, relatively clear climate generally associated with the Arctic night. Freeze-over of most of the northern waterways is usually complete by November but in the southern Arctic open water has considerable influence until December.

CONCLUSION

While it is true that for more than half the year the Canadian Arctic is a land of ice and snow, and a land of prolonged and severe cold, the summer season brings about such marked changes in the landscape and atmospheric circulation that this description cannot be applied to the balance of the year. For nearly five months, during the "open water" season, maritime influences predominate over most regions. The cooling effect of the ice-cold water and the added supply of moisture to the air results in a cool summer and a season of poor flying weather.

A graduate of Ottawa University, Mr. Cote began his career in Meteorology in 1958 as a forecaster at Trenton. In 1959, after a short tour of duty in Moose Jaw, he was assigned to CFB Gimli. He was posted to the 22nd NORAD Region Weather Centre, North Bay in 1963, before returning to CFB Trenton in 1964. During this second tour at Trenton, he served on a temporary duty assignment at the Trenton School of Meteorology. Mr. Cote has recently completed a six-month assignment at the Directorate of Meteorology and Oceanography, CFHQ, and has returned to the CFB Uplands Weather Office where he has been a meteorologist since 1966.

CLOSE CALL — OPERATIONAL HAZARD — SAFETY SUGGESTION



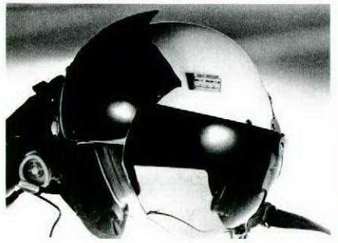
An old yarn (only the characters are new)

The T33 pilot and his passenger were enroute from Downsview to Rivers cruising along at FL350 when suddenly the canopy jettisoned. The crew immediately selected emergency oxygen, notified ATC, and commenced a maximum rate descent. The pilot then attempted a landing at Kenora but performed a "touch and go" when he realized that the runway was too short for a successful fullstop with the additional 10K to compensate for the canopy loss. He therefore climbed to 8000 feet and continued to Winnipeg. Although the weather was less than ideal for convertibles, the concluding leg of the flight was uneventful.

Reconstruction of the chain of events leading up to the canopy loss, and action taken subsequent to it, revealed numerous disturbing factors:

- Assuming that the passenger (because he had been around a T33 unit for some time) was familiar with strap-in and bailout procedures, the pilot did not brief him, nor did he personally remove the seat and canopy pins in the back seat. As a result, the pasenger found himself with a couple of straps to the good when he had finished; these he dropped down at the side of the seat. Somehow the canopy was fired by the alternate jettison handle on the floor.

- The seatpack lanyard was not connected to the parachute - *it was wrapped around the right lap belt.*



- Only the right seatpack strap was connected to the parachute.

- The seatpack tie-down strap was not removed from the seat.

- The pilot was inadequately dressed for the season.

Prior to flight, the passenger's attaché case had been stowed behind the letdown book holder in the rear seat, the nose compartment having already been filled. When the canopy departed, the attaché case followed, breaking the passenger's visor and damaging the vertical stabilizer to the extent that it had to be replaced. Fortunately the passenger's seat had been lowered, otherwise he might have been seriously injured. The repeated warnings concerning the danger of carrying luggage in the cockpit seem well justified.

cont'd on page 21

Good Show

Capt I.G. Sanford

MCpl S.H. Rice

MAJ R.W. PATRICK

Maj Patrick was strapping into a T33 for a student formation exercise when he noticed fuel coming from the tail pipe and drain of an adjacent T33 during its start-up. The engine failed to start and the groundcrew indicated to the student pilot that there was smoke emitting from the plenum area. The student quickly abandoned the aircraft and the groundcrew grabbed a fire extinguisher and proceeded to check the plenum area.

Maj Patrick vacated his aircraft and suspecting a "Wet Start", rushed to the tail end of the student's aircraft. He observed a fire burning at the turbine section and pools of raw fuel in the tail pipe and on the tarmac. Realizing the danger of the situation he climbed to the front cockpit and ground cranked the engine. This action blew the fire out.

Maj Patrick displayed true professionalism by his quick reaction to this emergency.

CAPT I.G. SANFORD

During the pitch in a CF101, Capt Sanford experienced a split flap. He immediately overshot, cleaned-up the aircraft and climbed to 8000 feet for a low-speed control check.

Satisfied that he could maintain control without difficulty down to 200 knots, and having obtained a visual inspection from another pilot who confirmed that the port flap was only partially down, he set up another approach.

Some difficulty was experienced during turns on final, and more in maintaining directional control during the landing roll. Investigation revealed that the malfunctioning flap had jammed the port aileron.

Capt Sanford's professional response to this serious emergency saved a valuable aircraft and shed light on a dangerous flap problem in the CF101 fleet.

MCPL S.H. RICE

Shortly after midnight a civilian pilot reported to Chatham Terminal that he was lost somewhere north of Chatham with an unserviceable compass. The controller immediately alerted MCpl Rice who was alone in the radar unit.

The disabled aircraft was unable to climb above 4500 feet because of heavy icing (in freezing rain), however MCpl Rice succeeded in identifying the target at 38 nautical miles northwest of base. Although hampered by a small intermittent paint and the effects of rain on his radar, he was able to direct the aircraft towards base.

By the time he had approached to 23 miles, the pilot was no longer able to maintain altitude; from this point on severe icing forced him continually lower. MCpl Rice, relying on his knowledge of local spot heights, vectored the pilot to a successful landing. After landing the aircraft was found to be completely encased in ice except for a small clear area on the pilot's windscreen.

By skillful operation of his radar, utilizing his knowledge of local terrain, and past experience, MCpl Rice demonstrated his professional capability in averting the loss of this aircraft.

WO G.G. MAGUIRE

While on duty as a radar controller during marginal weather conditions WO Maguire was handed a CF104 with an in-flight emergency.

A technical malfunction necessitated an extremely high approach speed for the aircraft. This in turn resulted in an unusual approach angle, compounding the difficulties normally encountered by a controller. Quickly anticipating the increased turning radius, the shallower glide slope and the high approach speed, WO Maguire conducted a successful radar approach.

By the alert and professional manner in which he handled this situation WO Maguire prevented it from reaching a point where the aircraft would have to be abandoned.

CPL J.L. FOULEM

During a periodic inspection on a Voodoo, Cpl Foulem, an airframe technician, had to remove a floor panel as part of a FOD check in the rear cockpit. While the area was open, he extended his check to inspect flight control components although they were not on the inspection schedule. During this latter check, he discovered damage to an oxygen line which would have resulted in its early failure.

By his initiative and attention to detail Cpl Foulem prevented a possible in-flight physiological emergency.

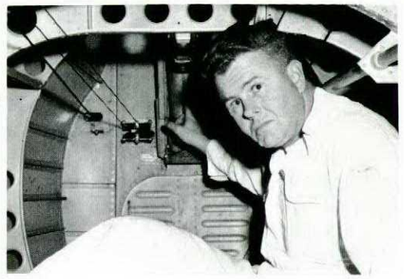
MCPL G.W. NOWE

During a routine check on a Caribou, MCpl Nowe detected an unusual noise when he selected the flaps down. His investigation led to the discovery of a failed flap-actuator assembly. This had allowed the sleeve to part from the motor and jam the actuator.

WO G.G. Maguire

Cpl J.L. Foulem

MCpl G.W. Nowe



During the recent SOFS Conference held at CFHQ, Col RD Schultz, Director of Flight Safety, personally honoured Maj R. Kendrick by presenting him with a Good Show Scroll. Maj Kendrick succeeds Maj G. King as SOFS, HQ CFE, on 1 October.

Through his persistence in tracing the source of the unusual sound, MCpl Nowe prevented a possible in-flight control problem.

CAPT H.E. KOONS AND CREW

Enroute to Ottawa from Goose Bay the Hercules had just levelled at 16000 feet when it was requested by Moncton Centre to join an air search. A twin-engined civilian aircraft enroute from Narssarssuaq, Greenland to Goose Bay had lost its radio compass and was encountering heavy icing.

Establishing radio communication with the aircraft, Capt Koons' crew plotted its headings during the previous few hours and by using VHF fade-out procedures determined its approximate position and directed the pilot to a more southerly heading. (The aircraft had overflown Goose Bay by more than 200 miles). They gave him enroute frequencies, arranged a rendezvous point and finally made visual contact in the Gagnon area. From there the pilot was vectored to Baie Comeau while the Hercules crew explained the letdown plate to him and continued to pass along frequencies. Weather at destination permitted a visual letdown and the aircraft landed without incident.

In their response to the impending disaster confronting the civilian pilot, Capt Koons and his crew demonstrated outstanding skill, coordination and professionalism.

Capt H.E. Koons
Aircraft Commander

Sgt L.P. Kuzminski
Flight Engineer

Sgt T. Poshtar
Flight Engineer

Lt E.D. Lindberg
Navigator

Capt W. Green
First Officer

Cpl J.J.A. Mayer
Trans Op

Low-level flips important

In his presentation the ICP stressed the importance of carrying low-level enroute charts in high-level aircraft.

- Flight Safety Committee

If it won't go away...

It was stated that the light aircraft parked by the met observers' shack no longer represented a hazard in that the helicopter pilots would *ignore* it.

- Flight Safety Committee

Confused drivers

The BFSO reported that ambulance drivers who have been exposed mainly to daylight operations become confused at night by the maze of unfamiliar aerodrome lighting. Night training has been arranged for the drivers.

- Flight Safety Committee

maintenance versus supply

The Scrounger

Capt K. W. Carpenter
Directorate of Supply Inventory CFHQ

How often have you gone to the consumption point on the floor to pick up a nut, bolt, or "O" ring required to finish the installation you're working on, only to find the bins empty? Frustrating isn't it? So off you go to sub-stores to find out why the bins haven't been filled. Your frustration turns to anxiety when you discover that sub-stores has no stock. Anxiety gives way to panic when a phone call to stock control reveals no outstanding demands or dues-in for the item.

Faced with the spectre of a delayed inspection, you head for the snack bar to calm your nerves over a cup of coffee with the guys, before hunting up your supervisor. Fortunately, your dissertation on the inadequacies of Supply, prompts the disclosure that Cpl Crafty on the other crew has just what you're looking for in his tool box. Thank God for the Cpl Craftys in our system, for they ultimately save the day! Or do they? Let's take a look at the supply system in this case and see if we can discover where it went wrong.

First of all, the key to good supply support is "consumption or usage data". If it is known in advance how much of an item will be required over a certain period of time, action can be taken to make sure it is on hand. Since no crystal balls are provided by the system, an educated guess must be made for which the criteria is simply, "How many did we use last year?". Suppose the stock record card shows that you used 24 of a certain kind of "O" ring last year. That's an average of two a month, right? Since Base Supply is authorized to hold four months stock they can demand 8 "O" rings and hold them in stock. They will also note that a lead time of two months is required to get more, so when half the stock is used, they will demand 8 more. Now enter Cpl Crafty. He knows these things are hard to get, see, and since "we got lots of 'em now" he takes a few extra to have on hand just in case. The stage is now set for the following scene:

YOU: "How come there's no "O" rings?".
SUB STORES: "We just put some out there yesterday."
STOCK CONTROL: "Demand "O" rings? What for? The card shows we should have 4 months stock."

This story has a happy ending because you found out who Cpl Crafty was and got your "O" ring, but suppose you hadn't; or suppose you're in Lahr and Cpl Crafty is in Cold Lake?

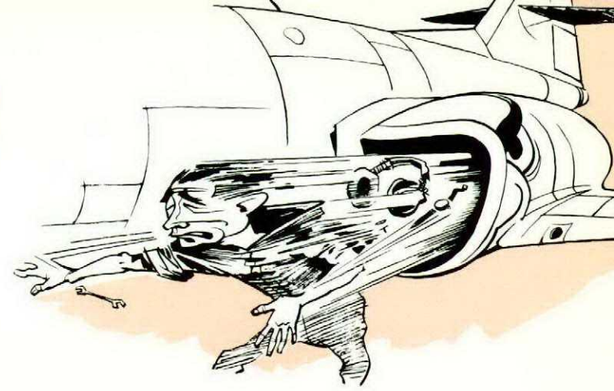
Your supply system is a complex organization which has its faults, but it will work well providing you treat it with respect and provide it with the vital information it requires. The scrounger is a monkey wrench in an otherwise well-oiled machine. By trying to ensure that "his" inspections are never delayed for lack of parts, he creates problems for others. Items hoarded in dark corners are lost to the system and are therefore not available to be moved to where they are required most. Scrounging at one unit results in IORs (ITEM ON REQUEST) at another.

Scrounging is not the only reason the supply system gets fouled up. Carelessness and poor planning are equally detrimental. Everyone in the maintenance organization can help by simply being aware of the supply implications of any problem which crops up. You have an SI or mod coming up? You're going to need parts aren't you? Maybe more than you've ever used before. Why wait until the bird comes in the barn before contacting Supply? Some nuts and bolts cost in excess of $400 each and can take up to 17 months to obtain. Admittedly these are extreme examples, but they serve to illustrate the kind of problem that could arise if Supply doesn't know what you're up to. Here's a list of suggested ways you can improve Supply support. Keep them in mind and your headaches will diminish rapidly.

- Keep consumption-point bins neat and tidy. Nuts and bolts dropped on the floor or placed in the wrong bins are hard to identify and frequently must be discarded.
- Don't use expensive aircraft nuts and bolts to fix miscellaneous equipment.
- A mod or special inspection can put pressure on the system. Give Supply a list of the nuts, bolts, and end items required, as far in advance as possible. Even a couple of days can make the difference.
- As aircraft get older, new problems crop up. Remember that if you've never used an item before, chances are supply will not have it in stock. It may not even be in the system. DON'T WAIT! TELL THEM NOW!
- Make sure the part you are ordering is the one you want. Read your EOs carefully and give Supply the correct part number or NATO stock number.
- Don't be a Scrounger! Take only what you need and let Supply do the warehousing.

Adapted from an article by Maj Lewis A. Smith, in USABAAR Aviation Digest.

SHORTCUTS



Maj K. S. Wong
DFS

"A maintenance crew decided to ground run a Tutor engine *WITHOUT INSTALLING INTAKE SCREENS*. This proved to be an expensive shortcut as it permitted ingestion of an intercom cord which damaged every stage of the compressor."

For years we have heard - that we are the best. There are many tales of how the mission was accomplished with only a junior officer, a couple of NCOs and a handful of technicians. The technicians not only launched and turned around more sorties than anyone else but also recovered to 100% serviceability in the shortest period of time. And all this was accomplished with a minimum of equipment, and in terrible weather, without adequate environmental clothing. Per Ardua Ad Astra! The stories were exaggerations but basically true.

Time has marched on bringing many changes. Aircraft are more complex and less forgiving. There are no more LACs (PTEs now) with 12 years experience. Trades have undergone adjustments, in some cases leaving temporary voids, in others, creating morale problems among those whose trade has been rescinded, amended, cancelled or held in abeyance. Reorganization and restructuring have left their imprint. Remaining number one requires adaptation.

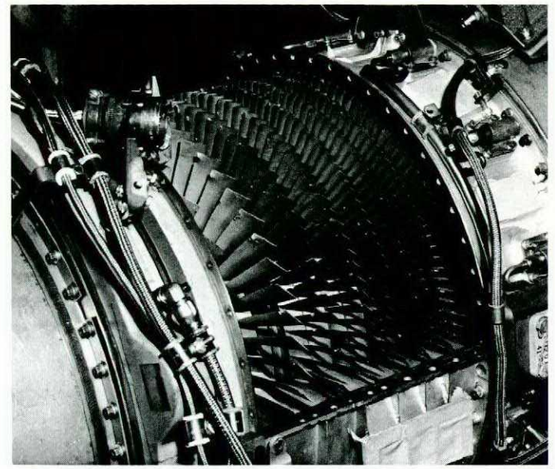
Taking shortcuts used to be an accepted way of life. Today it can lead to grief. Technicians once used a cloth wrench to fix a weeping hydraulic line, but now a weeping line on a 3000 psi system is a sign post to an air incident.

The older aircraft were more forgiving; consequences of a mistake were not necessarily disastrous, and the results of shortcutting - quick fixes, haste, poor orders, lack of supervision - were not so obvious. Such is not true of today's aircraft.

> *"...it was a foggy night, the lighting was poor, there was a lot of noise and nobody was specifically in charge of the operation. Two different trades were working on the aircraft with the engine running at 100%. A technician who was underneath and behind the duct came forward to make an adjustment to a blackbox. As he stood up near the intake, the engine relieved him of his watch and ear defenders. Proper lighting (which was available), and supervision could have saved the engine and eliminated the need for a trip to the hospital."*

Flight Safety files tell of numerous similar happenings - all preventable. However these files only reflect reportable occurrences. What about all the non-reportable snags? Periodic inspections and supplementary checks are called up to uncover and correct aircraft deficiencies. Ideally, items changed or inspected should remain serviceable until at least the next inspection. However, snag crews will attest to the greater frequency of unserviceabilities immediately after an inspection. Could abbreviated procedures be a factor?

"Through adversity to the stars" does not mean that shortcuts, quick fixes and haste are methods to overcome misfortune. Each person must follow the EOs. But this alone is not enough. Unsatisfactory conditions, including inadequate or poor EOs must be reported. All means of communication should be used to point out unsatisfactory practices; this includes personal conversation with your peers, superiors and subordinates. Only in this way can we remain the best.



"Every stage of the compressor was damaged."

Dangerous procedures

The CO spoke of his concern over the fact that a technician entered the wheel well of a T33 after it had landed with a nosewheel unsafe indication. All groundcrew must be cautioned to stay clear of aircraft with unsafe gear indications until all precautions are taken. It was decided that the CAMEO would look into the feasibility of providing a canvas sling for the nose section or an alternate procedure to prevent nosewheel collapse.

- Flight Safety Committee

It isn't fair

"The Base Flight Safety Officer is a real soft touch. He has a private office and a direct pipeline to the old man. If he played it right..."

Maj A. G. Carswell
BFSO, CFB Toronto

"What'll you have? You look a bit frustrated old Buddy!"

"Yer right, gimme a beer. I had a hell of a day! - And it's all because of that guy!"

"Which guy are you referring to?"

"What guy?? - Who else - Super-Snoop. You know, that Base Flight Safety Officer, Capt Dooley. He's always nosing around, looking for an accident to happen. Never gives us a minute's rest.

You wouldn't believe half of the things he does! He won't stay in his office where he's supposed to be, he's got this little black book that he's always writing in, a pocket full of checklists and he's ALWAYS snooping."

"How do you mean, snooping?"

"Well, you know. The Base Flight Safety Officer is a real soft touch. He has a private office and a direct pipeline to the old man. If he played it right he could get himself promoted. If he only knew enough not to rock the boat. Listen - I'm an old sweat an' I know the score. This guy is just going about it the wrong way. If I had that job, I'd send out a few forms and posters and let the other guys do the work. Same results. Why snoop and get everybody's back up. I can tell you, this guy won't last."

"Why?"

"Well, for instance. This morning he got the engineers all stirred up. Got them to fill in some big ditch he found on the field - a whole 20 feet off the side of the runway! Said it couldn't wait. Should be done now! He thinks some aeroplane is going to go off the runway and hit this ditch! A million to one chance and this guy is worrying!"

"What else?"

"Oh yeah! He calls up the base Maintenance Officer every time he catches some poor jerk driving a tug down the ramp at more than 15 miles an hour. Now you know that's stupid! These guys have a lot of work to do, and if they drive faster - they get it done quicker. Some of these guys can really handle those mules! And this character, for no reason at all starts cracking down. These guys are all driving so slow now they're hazards to us normal drivers."

"Another beer?"

"Yeah thanks. An' furthermore if this guy doesn't quit poking around in other people's business I'm going to tell him off. We've hardly had any accidents around here, and even if we did it would probably be some jerk pilot who didn't know his job. Dooley's a worrier. Always taking the most pessimistic view of every situation. Collects rocks and nuts and bolts and keeps them in his office. Thinks he's Sherlock Holmes, always trying to find out where they came from - as if that would make any difference. He's got FOD omania! And now he's talking about - Would you believe - MICRO FOD! You'd think we were running a hospital instead of an aerodrome. I never even heard of MICRO FOD! And listen to this. This character has made up an accident prevention checklist - a mile long. He gives one to every supervisor - even guys who have nothing to do with aeroplanes. And he follows them up by asking questions! He reads everybody's orders and procedures and gets his nose into everything. He keeps a bigger cardex file than the FBI! You better believe it! He checks into everything! Just the other day he starts looking into everybody's tool box. Wants a checklist on every tool box! Talks to all the mechanics. Wastes their time by showing them flight safety movies in their coffee breaks. Asks all kinds of nutty questions about morale and what kind of personal problems these guys have got. He's an amateur psychologist! He really believes that if guys are unhappy, they're more likely to have accidents!"

"Thanks - just a small one. My wife says I drink too much. Where was I? - Oh yeah, Dooley. As I said, I think there is something queer about this guy. He believes all that flight safety jazz. I mean he really believes it! He's on the snoop 24 hours a day and never lets anybody forget about aircraft accidents. I think he's some kind of a nut. A safety maniac! ....."

"Yes jusht one more. Thass my last one! If I drink any more old super-snoop will be checking my flight schedule for tomorrow. Cripes! What can you do about a guy like that? He's got everybody on the Base thinking about accidents! I can't go anywhere on the Base without seeing one of his ghastly posters.

Well, I think that he's doing it all wrong. He's been here two years working 24 hours a day, minding everybody's business, printing checklists like confetti, worrying everybody about accidents, looking for dust and dirt in the hangars, showing movies, giving lectures, writing memos, letters, checklists - an' you know what?"

"No, What?"

"It's a complete waste of time! We haven't had an aircraft accident around here for years!"

"You mean like about two years? - Have another."

"No, let me get this one."

"No need to. They're free tonight. Dooley just got promoted."

"No! You're putting me on! I can't believe it! That just shows the whole system is unfair. Here this young smart pants, hardly dry behind the ears, gets promoted - and for what? And here I am, twice as much seniority as him, always support the Mess, laugh at all the CO's bum jokes and what happens to me? - It just isn't fair!"

nothing new...

Something old

Aircrew at CFB Chatham are actively engaged in the CF Cost Reduction Program. Rumour has it that a number of them will receive suggestion award nominations for their improved utilization of flying gloves.

During an exclusive interview, the Squadron Ops Officer outlined how they have developed a scheme to determine the potential practical life of *gloves, flying outer and inner.*

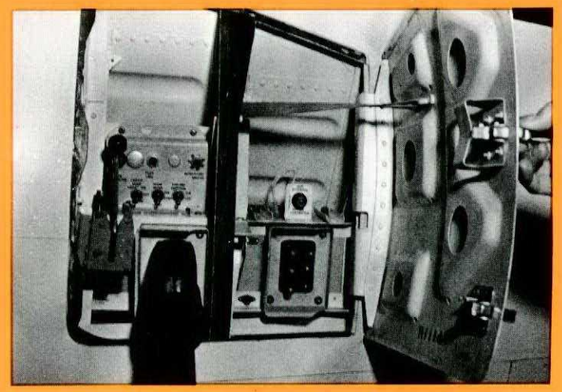
Three major modifications have been incorporated:

1. OPEN-MOUTH SLIP-ON MOD elastic removed, easy to put on when scrambled from a deep sleep at 2 a.m.
2. PALM MOD hard and crusty - ideal for crushing oranges, beer cans etc.
3. OPEN-FINGER MOD dual purpose - improved ventilation makes these gloves particularly effective at 10°F. It also increases tactility for switch flicking and braille reading.

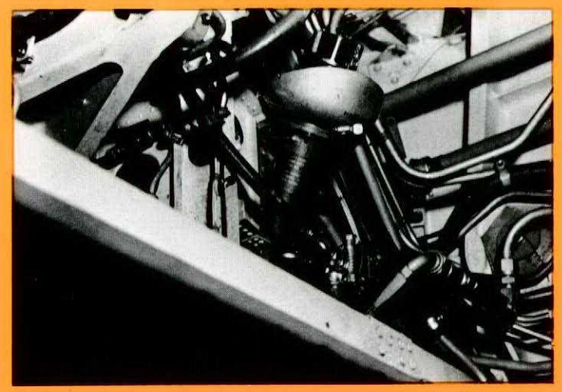
Maj Angus McAngus, Flight Commander, said, "I've got the Squadron record so far - 7 months, 3 weeks and 4 days on one pair - I'm trying for a year!" Good show, Angus!

3rd Lt Prune, newly assigned to the squadron, said, "Boy, I wish I had a pair like the Major's - they look operational."

A beautiful bird - but notice how low the inboard engines are slung? Makes for efficient vacuum-cleaning of FOD on taxi strip shoulders.



And oh, the luxury! Two ground power receptacles! But still, everyone'll remember that when they're both used the inputs will have to be in phase.

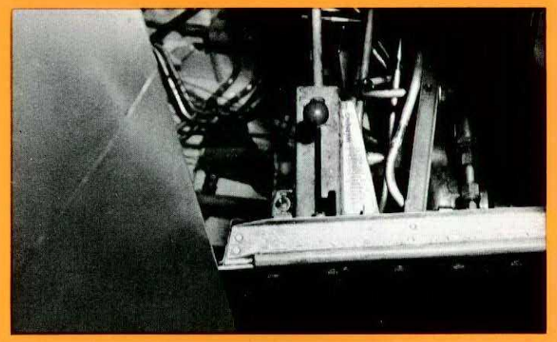


And what's this? Two different types of hydraulic fluid used on one aircraft? (Murphy was last seen skulking in the hangar corner).

forewarned is forearmed...

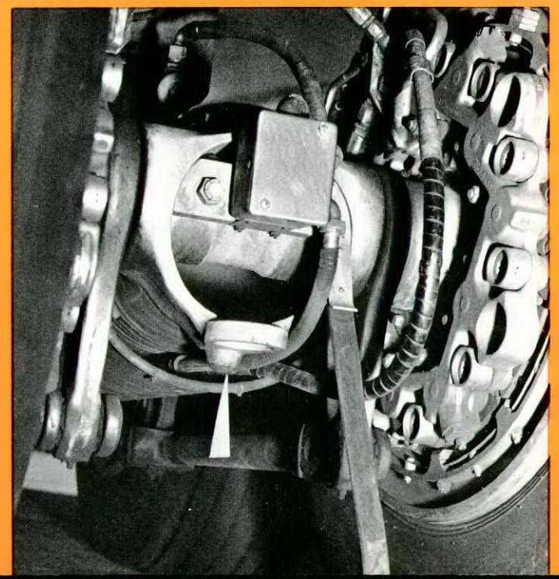
Staying ahead of the 707

The recent acquirement of four Boeing 707 aircraft means that the CF is getting a product proven by millions of commercial flight hours. Let's profit from the mistakes made by others during those hours, by learning to recognize and avoid the known hazards illustrated in these photographs.



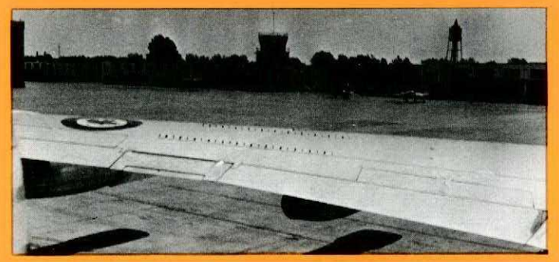
When in the detent, these ground door release handles prevent inadvertent door closure on technicians working in the gear wells. But detent plates are attached by only two small rivets which can easily shear.....

An old friend? Yup, the 707 bogie beam is also very susceptible to cracking due to small nicks or scratches - so watch it when jacking.



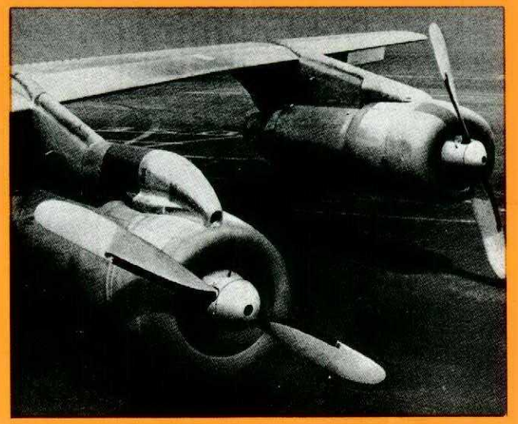
Capt DW Rumbold DFS

Like most aircraft, the 707 has pitch trim buttons on both control columns. But, unlike most other aircraft, if you simultaneously operate both buttons in opposite directions, there's a very expensive grinding noise from somewhere in back!

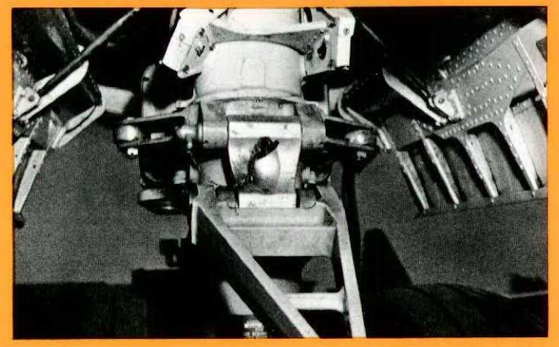


Wing vortex generators ensure effective aileron control. But watch these small tabs when working on top of the wing - they're only bonded on and are easily broken off.

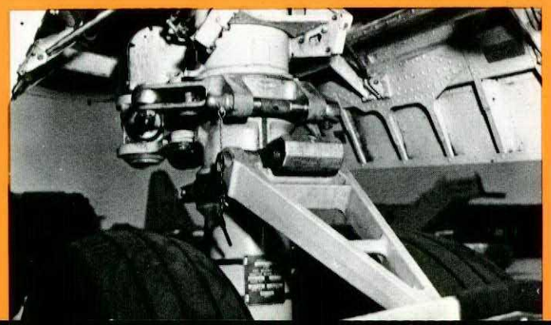
And how fortunate that the 707 nose tires are the same size as the Cosmo mains - makes for easy logistics. Pity the Cosmo main tires have less ply rating, though. (NSN 2620-00-993-1278 is the 707's 16PR nose tire, chaps).



Our first mod so soon? This hard-to-recognize situation must be avoided at all costs.



Notice the difference of the nosegear in these two photos? The upper one shows the configuration for flight, and the lower illustrates the "scissors" position for towing. Can't mix that up, can we? And we'll always remember to limit the towbar angle to 60° - and close the nosegear doors, too. Oh, yes, Sergeant, the 707 wingtips "grow" when being towed round corners the same way as they do on unsuspecting pilots.



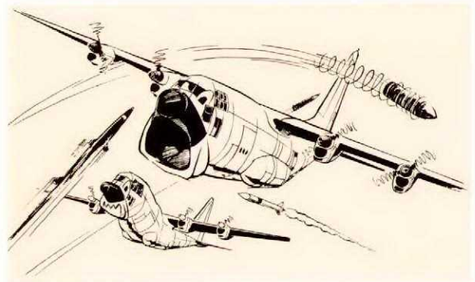
An FSO Speaks

Air operations in the land environment

Capt J. E. Greidanus
BFSO CFB Petawawa

Since the turn of the century CFB Petawawa has been well known as a land forces training establishment and the home of many famous Canadian Regiments. What is perhaps less well known is that Petawawa was the scene of the first military demonstration of flight in Canada - an inauspicious beginning for military aviation in which both the Silver Dart and Baldwin and McCurdy's second aircraft, the Baddeck I, were wrecked during landing attempts.

Flying was never more than a secondary activity for most people at Petawawa until the late sixties. With the exception of mysterious aircraft flying through live firing ranges from time to time, air activity was confined for



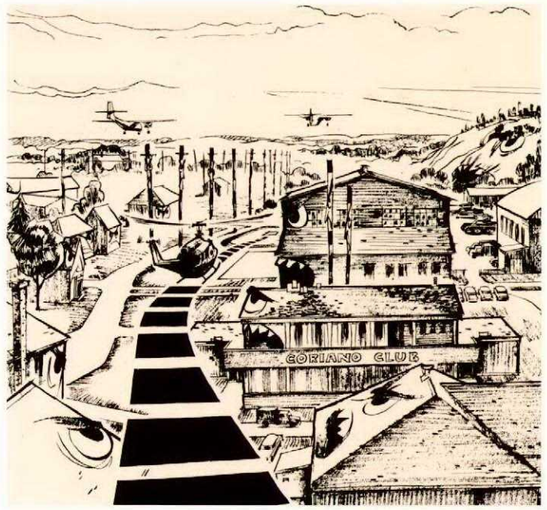
the most part to a few light aircraft operating from 42-foot wide runways, field strips, lakes and ice, in an observation role supporting the artillery. Flight safety was the concern of only a few.

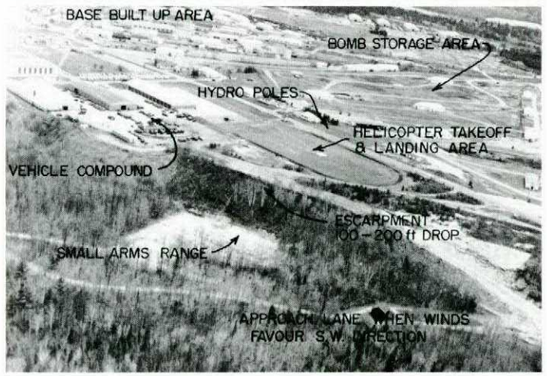
With integration came the arrival of more flying units at this land-environment oriented base, posing for flight safety people a challenge - to sell the need for flight safety education.

The firepower display at the Mattawa Plains in June 1969 was an excellent example of combined land/air elements working together, proving new techniques and modified concepts to meet the requirements of the new Mobile Command. During this exercise six types of aircraft, ranging from light fixed-wing, through helicopters and medium transports to supersonic fighters, operated in a one-by-three-mile area in conjunction with several kinds of live ground and air firing. Only the CUH-1H and L19 are permanently based at Petawawa, but the base is regularly visited by Otters, Buffalos and CF5s.

As air activity increased and more and more units, both land and air, became involved in some way with flying, the need for different as well as more stringent flight safety regulations became obvious.

After many messages, conferences, phone calls, visits and Base Flight Safety meetings, most of the facilities which are standard equipment at major flying bases are





now in hand or are about to be acquired. Met services, flight planning, tower control, trained crash-rescue crews and range control are now functioning. The tower operation requires further improvement however; it presently operates from the back of a truck to control a heliport, floatplane base and two fixed-wing airfields, all surrounded by live firing ranges, ammunition dumps and the base built-up area. The approach to the "Buffalo" strip from the south illustrates the problem: The approach goes over a village, the base ammunition dump and the old airfield which is still in use. After takeoff, pilots encounter a Restricted Area three miles to the north on runway heading.

The most hazardous area lies in field operations, the "bread and butter" of tactical aviation in Mobile Command. While many of the flight safety problems on the Base have been overcome or recognized, hazards in field operations continue to exist, as they do not lend themselves to easy solutions. This is new ground where experience is the teacher for all concerned.

Flight safety is a gradual build-up of experience, not merely a lesson to be taught and learned - experience based on common sense. The 17th century French philosopher "Descartes", once said: "Common sense is the most widely shared commodity in the world, for every man is convinced that he is well supplied with it." Every person involved with military aviation should exercise his supply to the limit - this is the most vital ingredient of flight safety.

Capt Greidanus was born in Djacarta, Indonesia. After completing high school in Holland, he served two years of compulsory military service there before emigrating to Canada. He joined the RCAF in 1954. His first transfer after wings graduation was to Winnipeg as a staff pilot. He later converted to jets on the T33 and in 1956 joined 445 Sqn. With 445 he took part in operation Nimble Bat I, flying one of the squadron's CF100s from Ottawa to Marville. Returning to Canada in 1958, Capt Greidanus became a T33 flying instructor at CFB Portage. In 1962 he joined one of the first CF104 squadrons and spent the next four years at 4 Wing and 1 Wing.
He was transferred to Chatham in 1967 after converting to helicopters and from there moved to 8 TAC Air Wing at CFB Petawawa, where he is now BFSO.

armament safety... Tender loving care

Someone once described a particularly notable feat as "a triumph of brute force and bloody ignorance", a definition which probably owed more to jealousy than accuracy.

In the armament business, however, brute force *is* bloody ignorance, and often very bloody, at that.

Practice bombs weigh from three to two-thousand pounds and while the big beast at least gets an adequate degree of respect, if only because nobody wants it dropped on their toes, there is an increasing problem with the smaller practice bombs. The increased emphasis on conventional weapons has led to a sharp increase in practice bomb usage, and in turn to a safety hazard stemming from boredom and over-familiarity with routine.

All of the practice bomb charges are sensitive to friction and impact, and most CF bombs require the subsequent insertion (gently, dammit!) of a firing pin. *Neither operation must be forced.* But they have been in the past - and injuries have resulted.

This problem can only be overcome by:

- regular briefings for technicians, with emphasis on pertinent hazards
- inclusion of all necessary precautions in the written SOPs controlling the operation
- regular and close supervision to ensure compliance.

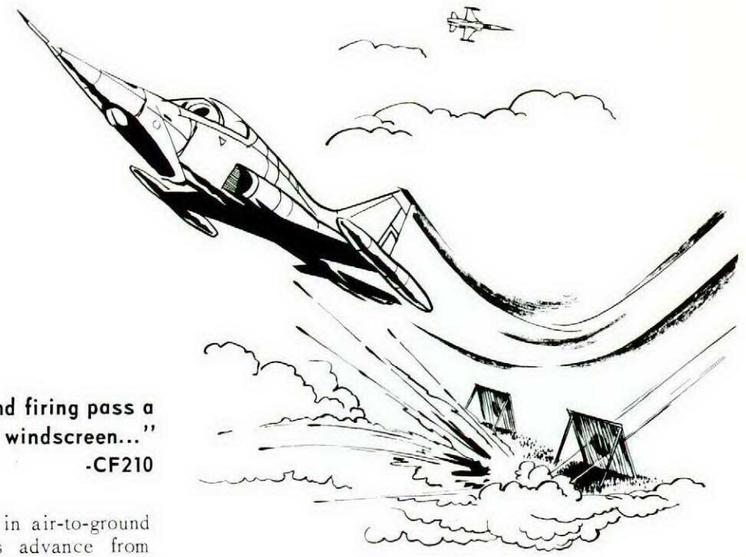
Remember - the individual cannot afford to lose any fingers, nor the Armament Shop any hands.

SOFS Conference 1970

Delegates to the recent SOFS Conference held at the Directorate of Flight Safety, CFHQ, are shown with the Director, Col R.D. Schultz. Front row, left to right: Maj C. Loubser, AETE; Capt R.W. Slaughter, TC (SOFS-2); Capt J.G. Hebert, BFSO, CFB Bagotville; Capt P. Fuller, ATC (SOFS-2); Col Schultz; Maj T. Fletcher BFSO, CFB Trenton; Maj H.A. Johansen, Marcom (SOFS); Maj D.J. Peters, Mobcom (SOFS); Capt R.N. Cadorette, Mobcom (SOFS-2). Back row, left to right: Lt K. Stewart, TC (SOFS-3); Capt R. Goldie, FSO, 4 CMBG; Capt R. Simpson, FSO, 1 CAG; Maj R. Kendrick, HQ CFE (SOFS designate); Maj G.R. King, HQ CFE (SOFS); Maj H.B. Larsen, ADC (SOFS); Capt C. Robinson, BFSO, CFB Shearwater.

heads up for...

Ricochets



Capt W. G. Walton
CFHQ

"During an air-to-ground firing pass a ricochet made a four-inch crack in the windscreen..."
-CF210

The hazard of ricochets is inherent in air-to-ground weapons firing - particularly when pilots advance from the controlled range with its prepared strafe target to a tactical range where they are free to go after "targets of opportunity".

Although CF air-to-ground activity has not been extensive in recent years, the success in avoiding ricochet damage has nonetheless been outstanding (only four incidents since Jan 65). Two factors emerge as mainly responsible: pilots' disciplined adherence to range orders and the design of manned ranges.

Range orders establish the criteria for a safe operation by specifying attack angles, cease-fire distances, minimum pull-out altitudes (depending on type of armament) and recovery procedures. All range exercises are controlled by an experienced Range Safety Officer.

Controlled ranges are designed with the strafe impact areas located on flat terrain, free of rocks and debris and able to cushion or absorb projectiles. Usually the area is covered with approximately one foot of sand which is kept clear of spent projectiles by special removal equipment.

With so few ricochet hits in recent years, the obvious question is "Why all the concern at this time?" There are a number of reasons:

- The role of the CF5 and its varied armament, and the increased conventional role of the CF104 requires pilots to receive regular training away from "canned" ranges - on targets such as simulated bridges, runways, convoys and so on. Most of these have irregular impact areas which, coupled with varying dive angles, create erratic ricochet patterns.

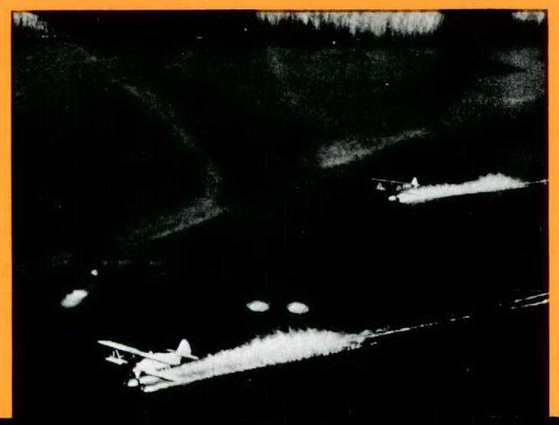
- Since most of the ricochets encountered are from debris blasted into the air, the hazards are more numerous away from the "canned" range.

- The 20mm cannon in the CF5 causes more debris, flying a greater distance than we have been accustomed to with our traditional .50 calibre machine guns.

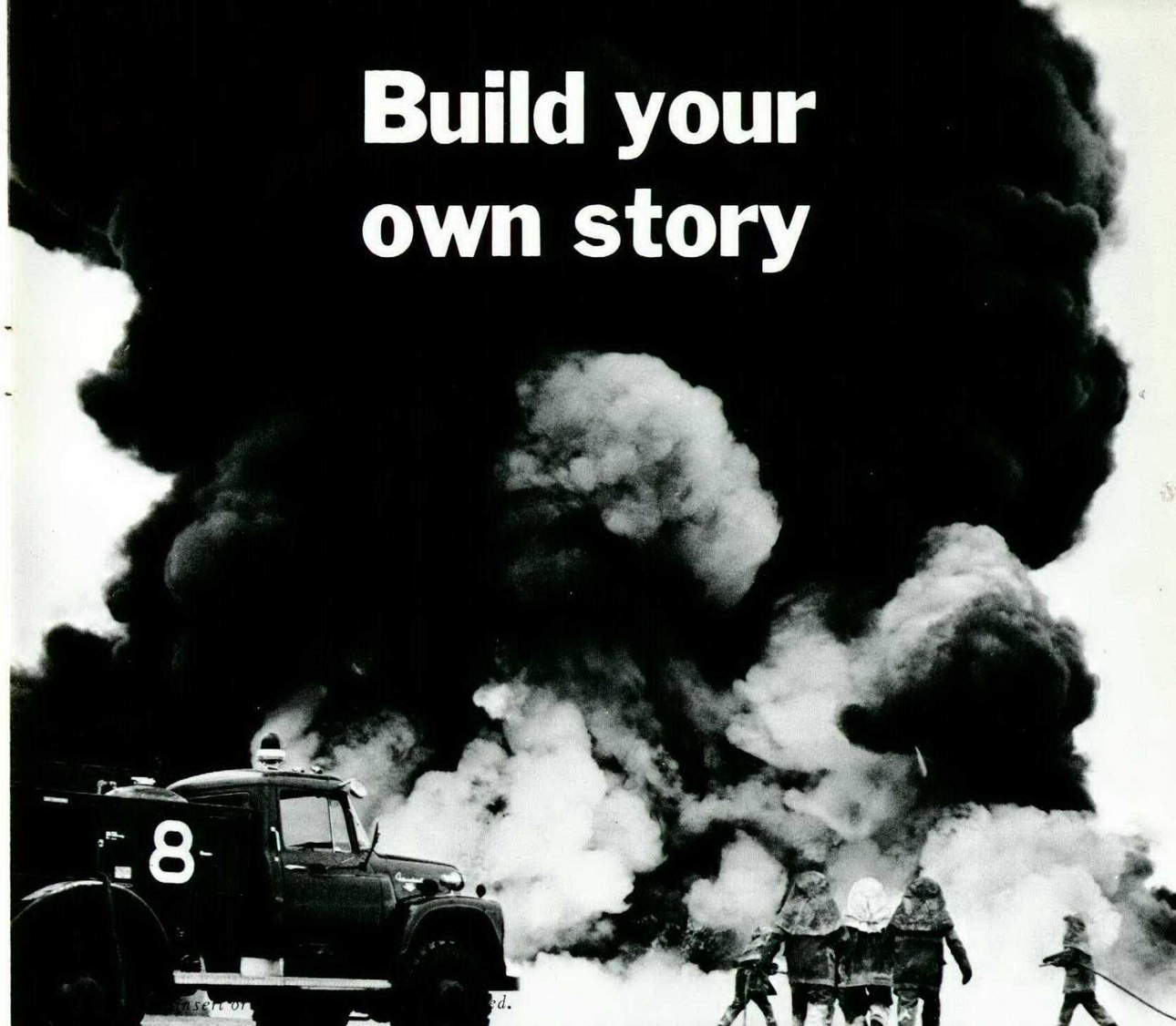
As the air element moves back into the conventional business a good thought for pilots to keep in mind is that the aim of the game is to kill *the target*...

Flash-back

During duff weather when enough water accumulated on the runway, the instructors demonstrated hydroplaning.



Build your own story



...sert or... ...ed.

...was a (nice) ... (good) ... ...d) day (in) ... ...placed a LOX converter on a bench outside the shop to vent. There were several full converters on the bench awaiting installation for the next launch. A considerable quantity of flammables was stored nearby.

LOX from the vent valve was dripping on the asphalt and a (small) (large) area was (wet) (frozen). The maintenance officer walked around the corner of the building with a lighted cigarette just as an aircraft captain drove up in a tow tractor. An explosion was followed by a fire and _____ men were killed, _____ men were injured, one tow tractor and the shop were destroyed.

Investigation revealed that the explosion and fire were caused by (a) (b) (c): (Select one or more)

a. The maintenance officer's cigarette.
b. A spark from the hot exhaust of the tow tractor.
c. Spontaneous ignition of the LOX on asphalt, a petroleum product.

The investigators also determined that there was a lack of supervision at the (squadron) (department) (division) (branch) level and recommended courts martial for _____ officer(s) and _____ man (men) in the supervisory chain.

The story ends here with a moral established. It was a bad day (at) (in) _____ .

A better middle (and beginning) to this story might go like this: The maintenance officer recognized the hazardous situation and took action to prevent the possibility of such an accident. He established an isolated area for handling LOX converters and installed prominent "No Smoking" signs. He arranged to have all petroleum products and other flammables moved to a remote location and provided drip pans. He also established a procedure to ensure that all personnel receive instructions concerning the hazards of LOX and gaseous oxygen handling.

- USN APPROACH

on the horizon...

New protective clothing

Mr. N. Platt
DCGE

There have been many mumblings around expressing general dissatisfaction with technicians' protective clothing. The maintenance staff at CFB Edmonton did more than mutter; by translating words into actions via the MACR and UCR procedure, they persuaded CFHQ authorities to make a study of the problem. As a result, the Directorate of Clothing and General Engineering (DCGE), the CFHQ agency responsible for the design and development of clothing and personal equipment, has produced a clothing system which should considerably improve the lot of the aircraft technician.

One of the many deficiencies in the old clothing is that it has been built up over the years piecemeal. The new clothing is based on a *systems concept* and is designed to provide environmental protection, against wet, cold-wet and cold-dry, and also give protection against work hazards. The system will go on user-trials during the latter part of 1970 in Air Division and Air Transport Command and if successful, early introduction is anticipated.

All too frequently people do not appreciate that CFHQ agencies can only solve problems they know to exist. The thing to do then, is to tell your supervisor. After that you can sit back and gripe, with the satisfaction of having passed the information to the people who can effect a fix.

The photographs show some of the more interesting items.

The technician is wearing the basic working dress. This consists of a hip length jacket with breast pockets, trousers, baseball cap and shirt. The jacket, trousers and cap are dark green, with a lighter shade for the shirt. Footwear is a standard item, *Shoes Shipboard*, a "chukka-type" boot with the sole pattern designed to ensure good traction and minimize the pick-up of gravel and so on which could damage aircraft surfaces and create FOD.

The basic dress will be used for clean jobs and for travelling to and from work.

Here the technician wears a new coverall. It is designed to minimize the FOD source inherent in open pockets. The coverall is slim-fitting with "velcro" wrist and ankles closures, and waist adjusters; the front closure is a slide fastener. There are only two pockets; both inside - one for personal items and one for pencils or check-stamp. The material chosen minimizes static problems and eliminates shrinkage. The coveralls are coloured for trade or function identification. In this case brilliant yellow, for line servicing.

For cooler weather the technician supplements the coveralls with an improved version of the Intermediate Jacket. This has increased insulation and improved design.

A yellow lightweight pullover parka and trousers are provided for wet weather operation. These are completely windproof and waterproof and in conjunction with undergarments and insulated rubber overboots will provide comfort down to 0°F.

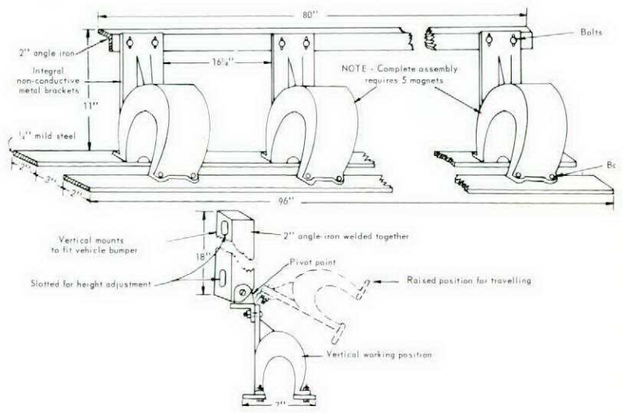
In extreme cold weather, the technician wears the improved parka and windpants which are also dark green. The parka has been reduced in weight without sacrificing the insulation properties. A new Face Mask has been developed which is designed to give protection in conditions of high wind chill. The mouth cup is porous and has a wire frame which enables it to be moulded to the nose to prevent exhaled breath rising upwards and freezing eyelashes or goggles. There is also an insulated winter cap with pile-trimmed ear flaps.

FOD Picker

This magnet sweeper has been added to the anti-FOD campaign at CFB Chatham. It is the result of inexpensive local manufacture using permanent magnets which are normally converted to scrap metal. The magnets are obtained from Magnetron Tubes used in ground radar equipment.

Best results are achieved with the bar set at 1 to 1½ inches off the ground, at 5-7 mph. Trials in this configuration have shown excellent effectiveness with fallen bristles and most metallic FOD, including metal filings generated by SNIC equipment scraper blades and shoes. The magnet bar can be quickly cleaned off by hand or with a stiff broom.

A one-way pivot anchor point enables the magnet bar to be raised well off the ground when travelling over rough terrain.



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: Commandant, CFFTSU, CFB Winnipeg, Westwin, Man. Attn: ICPS.

Instrument Approach Procedures Criteria

Have you ever been in a bull session on how to design instrument approaches, which sent you looking for the rule book? Chances are that the dog-eared copy you finally found was the only one on the base. If so - read on!

A new publication became available on 1 Jan 70. It provides pilots with a handy reference for determining such items as obstacle clearance, lateral dimensions, distances and so on. GPH 209, "Manual of Criteria for Instrument Approach Procedures," has been designed as a guide for the development of all instrument approach procedures which are the responsibility of the Canadian Forces. It generally conforms to the provisions of an ICAO Document; "Procedures for Air Navigation Services, Aircraft Operations" and contains additional data from other sources.

In the next two issues of "Flight Comment" we will review some of the points in the publication which concern pilots. In this issue we are dealing with the basic makeup of the approach procedure; procedure identification, aircraft characteristics, temperature effects, units of measurement and approach procedure composition.

APPROACH PROCEDURE IDENTIFICATION

Instrument approach procedures must be thoroughly identified to eliminate any confusion between the pilot and an air traffic control agency:

- procedures permitting straight-in final approaches are identified by the type of facility which provides track guidance during the final approach, and by the runway to which the approach leads. (Examples: ADF - RWY 26; TACAN - RWY 15)

- Procedures requiring a circling approach are identified by the type of facility providing track guidance during the final approach, and a number. (Examples: ADF - 1; VOR - 1; TACAN - 1)

AIRCRAFT CHARACTERISTICS

Aircraft performance directly effects the airspace and visibility required to carry out such manoeuvres as long turns, corrections on final approach, and circling or missed approaches. A system of aircraft categorization based on landing weight and speed makes allowance for variations in performance. The weight is the maximum authorized gross landing weight, and the speed is 1.3 times the stalling speed in the landing configuration, at maximum gross landing weight. Aircraft Categories are explained further in GPH 200-201. An aircraft fits in only one category - the highest category in which it meets either of the specifications.

TEMPERATURE ERROR

Since pressure altimeters are calibrated to indicate true altitude under ISA conditions, an altimeter is generally in error as a result of temperature deviations. If the temperature is lower than standard, an aircraft's true altitude is lower than the figure indicated by the altimeter. With this hazard in mind the following items are considered when designing instrument approach procedures:

- The average winter temperature for the aerodrome is calculated.

- This temperature is then used to compute true altitudes for all heights expressed in the approaches, except precision approaches, where glidepath guidance is available.

UNITS OF MEASUREMENT

- Bearing and tracks are expressed in degrees magnetic, except that True and Grid references may be used in northern areas.

- VOR/TACAN radials are identified as the magnetic bearing "From" the facility and are prefixed with the letter "R".

- Aircraft speeds are expressed in knots.

- Area protection includes an allowance for wind speed of 60 knots from any direction.

- A standard rate turn (3° per second) is assumed throughout.

- Distances are expressed in nautical miles and tenths of miles except that visibilities are expressed in statute miles and fractions, and Runway Visual Range (RVR) is expressed in feet.

- Altitudes are expressed in feet above MSL.

- Flight levels apply in the Standard Pressure Region.

- Minimum altitudes for instrument approach procedures are referenced to the aerodrome elevation except that for precision approaches, minimum altitude is related to the threshold elevation of the runway.

INSTRUMENT APPROACH PROCEDURE COMPOSITION

An instrument approach procedure normally is composed of four individual segments:

INITIAL APPROACH - transition from the enroute phase of flight into one of the instrument approach procedures;

INTERMEDIATE APPROACH - configuration, speed and position adjustments to prepare for entry into the final approach. Procedure turns and high altitude penetrations are included in this segment;

FINAL APPROACH - aircraft alignment and descent for landing. A final approach may be made to a runway for a straight-in landing or a circling approach;

MISSED APPROACH - the aircraft is returned to an enroute or holding environment.

In the next issue we will examine each of the above approach segments.

These changes will soon be included on the approach plates. However, if from this information you have already discovered errors on some of the approach procedures that you use, put it down as a "NOTUN" card and mail it now!

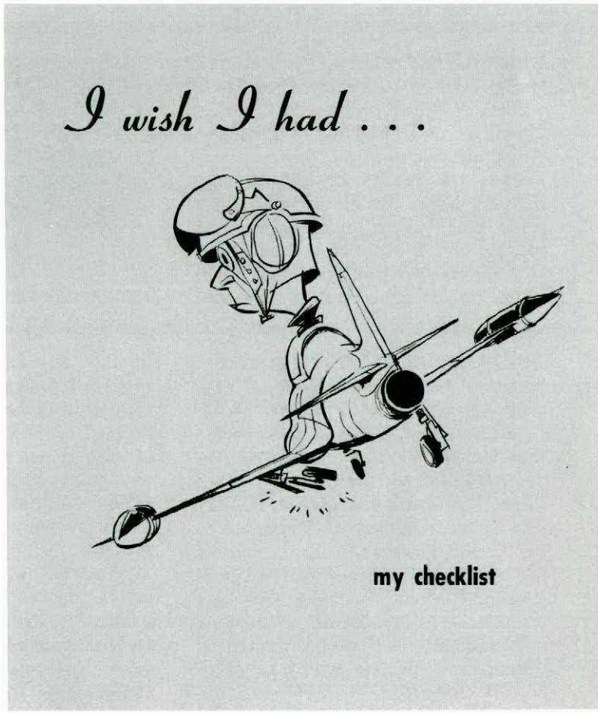
Units desiring additional copies of the manual, GPH 209, should submit a Unit Demand to the Canadian Forces Publication Depot, Rockcliffe.

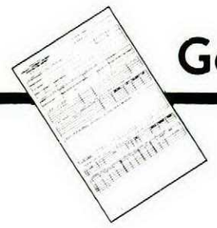
cont'd from page 5

Had an ejection been necessary the chances of successful escape by the passenger would have been practically nil since seat and seatpack interference was inevitable. The pilot's chances of survival would have been small with inadequate dress for the below freezing temperatures in the area.

Although the pilot clearly stated that he had lost his canopy he did not formally declare an emergency. Both Kenora and WG Radar Centre treated the occurrence as an emergency in that traffic was relatively light and they were personally concerned enough to grant priority. It was learned from the tapes that the pilot, in essence, expected to be handled as if he had declared an emergency. ATC officials pointed out that because there was no official declaration and a corresponding secondary radar squawk, had they lost radar contact with the aircraft (low altitude), they might have thought nothing of it. Furthermore, had another emergency been declared in the area the occurrence might not have received adequate attention. Winnipeg ATC took it upon themselves to offer crash vehicle assistance, but it was refused.

This is the third such incident involving non-rated T33 passengers in the last few months. In each case (2 canopies jettisoned, 1 gear raised), the pilots assumed their passengers were checked out and contravened Command Orders by dispensing with the required briefings and supervision of strap-in procedures.





Gen from Two-Ten

LEARN FROM OTHERS' MISTAKES—you'll not live long enough to make them all yourself!

ARGUS, INADVERTENT AUTO-PILOT SELECTION Following a night mission the pilot experienced extremely heavy controls during roundout and landing. Once on the runway a definite restriction in forward control column movement could be felt and as the landing roll continued the yoke went to the full left position and began oscillating. The post-landing check revealed that the auto-pilot was engaged. Apparently the co-pilot had inadvertently selected it while groping for the landing lights.

For many years the Argus approach check included "AUTO-PILOT...OUT & OFF". Recently this item was deleted, but without any action being taken to provide a positive safeguard against inadvertent selection. It has since been returned to the checklist.

ARGUS, NOSE GEAR COLLAPSE A technician was explaining to a flight engineer what happens when a bolt shears on the UP/DOWN lock assembly. Contrary to local orders, he removed the ground safety pin, without ensuring there was hydraulic pressure in the system. The nose gear immediately collapsed. Fortunately, a nose radome dolly, under the aircraft, prevented the men from being crushed. The nose radome, radar scanner and bomb aimer's window required replacement and the vertical stabilizer required repairs as a result of striking the ceiling.

The aircraft had earlier been supported on a nose jack with the safety pin removed. This allowed the nose gear assembly to be lifted a short distance by hand to permit installation of bolts in the nose gear door assembly, following a periodic inspection. The gear was then allowed to free fall without the aid of hydraulic pressure and the safety pin was installed. After the aircraft was lowered to the ground, the jacks were removed.

Investigation revealed that in addition to the technician's breach of orders, the nose gear was not correctly rigged in accordance with the EO. It also determined that if hydraulic pressure has not been applied, the nose gear may actually be unlocked, even though the ground safety pin has been correctly installed. The existing tolerances on the nose gear warning device would not under these circumstances indicate an unsafe condition. The situation was recognized earlier and an engineering change proposal (ECP) was developed to correct it. As a result of this occurrence, action has *now* been taken to raise the status of the ECP.

HERCULES, RUNAWAY The aircraft was parked on the ice-covered Thule refuelling ramp with the wheels chocked and parking brake set. A hydraulic leak in the brake system caused the brakes to fail and the aircraft began to move, shoving a wood chock aside on one wheel and rolling over a sandbag on the other. It continued to roll down the ramp, which sloped sharply away from the tail, picking up speed and heading directly for a hangar. Five separate attempts to stop it with wood chocks failed. Just when a collision with the hangar was imminent, the nose-gear cocked, the aircraft spun around and came to a stop on its own without causing any damage.

This close call gave renewed impetus to efforts aimed at obtaining completely satisfactory ice chocks.

ice chock design being evaluated

BUFFALO, BENDS The aircraft departed a west-coast base for a non-stop coast-to-coast flight. After levelling at FL 250 and discovering that he was unable to maintain the desired airspeed, the pilot requested "lower" and was assigned to FL210. The descent had to be continued to 15000 feet however, because one of the co-pilots was experiencing symptoms of "bends" in his elbows and shoulders. At 15000 the discomfort subsided and the Captain elected to "press-on". An hour later a climb to FL190 brought a recurrence of the co-pilot's malaise and clearance for another descent was obtained, this time to 17000 feet, which they maintained to Torbay. From time to time during the flight, at the suggestion of crew members (all HAI qualified), *the co-pilot did mild exercises to relieve the pain.* (Physical exercise actually lowers the altitude threshold for bends.)

The following morning, still experiencing pain, he was examined by a local civilian doctor who immediately diagnosed decompression sickness and ordered him flown to another base to recover in a decompression chamber.

As a result of the apparent lack of appreciation of in-flight physiological problems, the Base Flight Surgeon subsequently conducted briefings on decompression sickness for all squadron aircrew. Squadron Flying Orders have *now* been amended to include action to be taken in the event that physiological problems are encountered while airborne.

This incident clearly illustrates the impracticability of extending the operational profile of unpressurized aircraft beyond the physiological limitations of the crew.

OTTER, OIL STARVATION The aircraft had been parked outside over night with engine covers and two catalytic heaters installed. On start-up in the morning there was no indication of oil pressure, however the pilot elected to continue warming up the engine. Soon an unusual engine noise accompanied by intermittent power loss prompted him to shutdown the engine. Oil starvation had caused the number 9 cylinder to crack from the front sparkplug to the rear one.

The pilot assumed that the oil gauge was faulty, but AOIs clearly state that the engine must be shut-down if no oil pressure is indicated within 30 seconds. Pressing on regardless led to damage requiring an engine change.

CH112, MURPHIED OIL FILTER During a routine training flight the aircraft returned to base with unusually low oil pressure.

The restricted oil flow was caused by the engine oil filter which was found crushed and distorted; *it had been installed backwards.* To effect this murphy, a technician had converted an uncomplicated installation into a difficult and awkward chore, requiring considerable force.

correct method

Fortunately his inept handling of a frequently performed task did not have more serious consequences.

Comments to the editor

BAMSO suggestion

In most cases the function of the Base Aircraft Maintenance Safety Officer (BAMSO) is to periodically inspect hangars, flight line, and shops, observing procedures and general shop safety and being on the lookout for FOD. If that is the extent of maintenance safety activity however, the Safety Program will be shortlived as is any hand-to-mouth operation.

An effective aircraft maintenance safety program requires that responsibility be shifted to the section heads, and from there to the supervisors (Warrant Officers and Sgts) who are in daily contact with the technicians. The responsibility for carrying out safety inspections and corrective measures must be placed on these supervisors.

Section heads should have the responsibility of looking at the more complicated and hazardous operations, such as jacking of aircraft, entering integral fuel cells, engine changes and so on. The most effective way of analyzing these jobs is to carry out a "Job Safety Analysis". (An article with this title appeared in the Jan/Feb '68 Aviation Mechanics Bulletin.) The analysis of each job must be carried out by the immediate supervisor and be checked by each level of supervision. I suggest the following procedure:

- List each step, no matter how small, that must be carried out to complete the job;
- List the hazards involved and steps that are taken to eliminate or reduce them;
- List changes or improvements that should be added to reduce potential hazards;
- Outline the actions required to safeguard or rescue personnel should an accident occur;
- List all published safety precautions and how you apply them on the job;
- Prepare a checklist of steps to be carried out and following each step, add any cautions or warnings that might apply as the job progresses;
- If the job involves more than one person, each person should have a checklist prepared, (on a card preferably) to be followed carefully as the job proceeds.

One serious omission in our Flight Safety Program I feel, is the almost total disregard of the BAMSO function. The BAMSO should have more training and more emphasis must be placed both on his role and on his contributions to safety. His assistance in preparing the technical aspects of the BFSO's various reports is valuable. I suggest that the BAMSO receive the FSO course and an industrial safety course, however the latter I feel should be developed into a specialty along the lines of the FSO course.

A BAMSO, like an FSO, must be capable of managing a Safety Program, not merely someone who pins posters on a notice board. He must ensure that all personnel are aware of the accidents and maintenance errors of *other* bases and formations and even other services, and then devise preventive measures for his

own environment.

These comments have only scratched the surface, but it is a beginning. With motivation and dedication an effective aircraft maintenance safety program is within our reach.

Capt T.G. Andrews
BAMSO, CFB Uplands

Thank you for taking the time to jot down your thoughts on safety and the means of achieving a safe operation. You are in a unique position to assess the safety program and we in Flight Safety share your views.

Your position as BAMSO is new and in use only within some ADC Bases. It follows that terms of reference will require refining; your letter and critique are a part of this process.

DFS has no immediate jurisdiction or responsibility over BAMSOs although we have the same goal - prevention of accidental losses of aircraft resources - which includes personnel.

Flight Safety has suffered the same growing pains that you are experiencing. The program has grown from record-keeping to its present role of educating everyone that safety is each individual's responsibility. There is still much to be done. Although the benefits of a safety program should be obvious, it has been a slow process to convince everyone that if losses are controlled, increased profits result.

The BAMSO responsibility is large and complex. Like the FSO, he must be an advisor and a monitor and also, like the FSO, he requires special training. At the present however, it is not possible to adequately provide training; formal courses like the FSO course are booked to capacity for several years because of the requirements for FSOs on each DDH and Helicopter Unit - very small units compared to squadrons and bases. Adding to the problem, industrial safety courses do not come under the terms of reference of Flight Safety.

Even without a formal course you appear to have realized where your responsibilities lie. Your detailed analysis for involving everyone in Safety, is an indication of how well you have grasped the Safety message - a necessary requirement for anyone associated with Safety.

The suggested checklist contains points that are considered when EOs are written and card systems originated; however, the procedures and the written word are not always correct. For this reason your analysis procedure is a necessary adjunct. Only by continuous critical analysis of procedures and proper documentation can things and thinking be changed.

Again thanks for your comments. Perhaps a visit to this Directorate may provide further guidance and ideas for you in your most important position.

Aircrew sunglasses delay

Being a driver-airframe (sometimes), I read with interest the article "The Conversation Piece", in your Mar/Apr issue.

It contained good stuff which set a lot of aircrew straight on the visor and chinstrap bit. What really made me sit up and take notice, however, was the short sentence at the end of the ninth paragraph, which said, "A new design is being tested". The "new design" referred to *sun glasses*.

It is about four years since I was one of the individuals chosen to evaluate a pair of sun glasses of a new design. They were quite similar to the USAF standard issue and were a very big improvement over the Canadian Forces' variety. I know that all trial users did not endorse them as whole-heartedly as I did but, generally speaking, everyone I spoke to agreed that they were a big improvement over the existing glasses - even though some individuals had suggestions for further improvement. To find that they are still being *tested* is utterly appalling!

Are the sunglasses destined to go the route of the new altimeter? i.e. ten years (plus) from beginning of project to the cockpit. Is this another case of the better always being the victim of the best?

Surely by now we must be beyond the testing stage in this project. If our own design is presenting insurmountable problems, we could do a lot worse than an "off-the-shelf" buy of the USAF sun glasses.

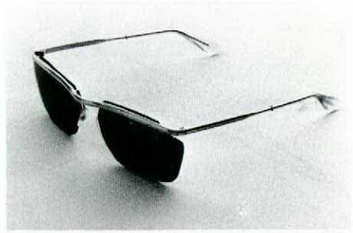
Or - could this be another long underwear caper?

Maj C.H. Leake
FMC HQ

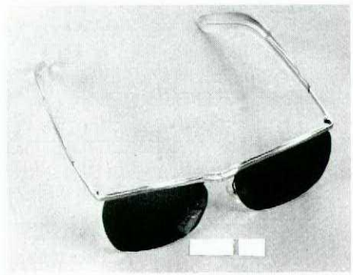
Since 1966 three separate evaluations of aircrew sunglasses have been undertaken, the first being the one in which you participated (type 1). The questionnaires (those that were returned) indicated that generally this design was not acceptable to aircrew. In addition, the lens-frame attachment was not technically acceptable.

The second trial, in 1969, resulted in rejection of the type 2 design. Aircrew flying the CF101, T33, Argus, Yukon and helicopters rejected this design for various reasons, including the small size of the lenses, fragile construction and ear pieces that interfered with the acoustical seal of ear defenders.

The latest trials, of the familiar looking type 3 glasses, began in May of this year. These have soft plastic nose pieces and weigh 16 grams less than the present design.



Type 1



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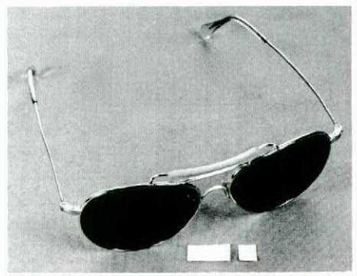
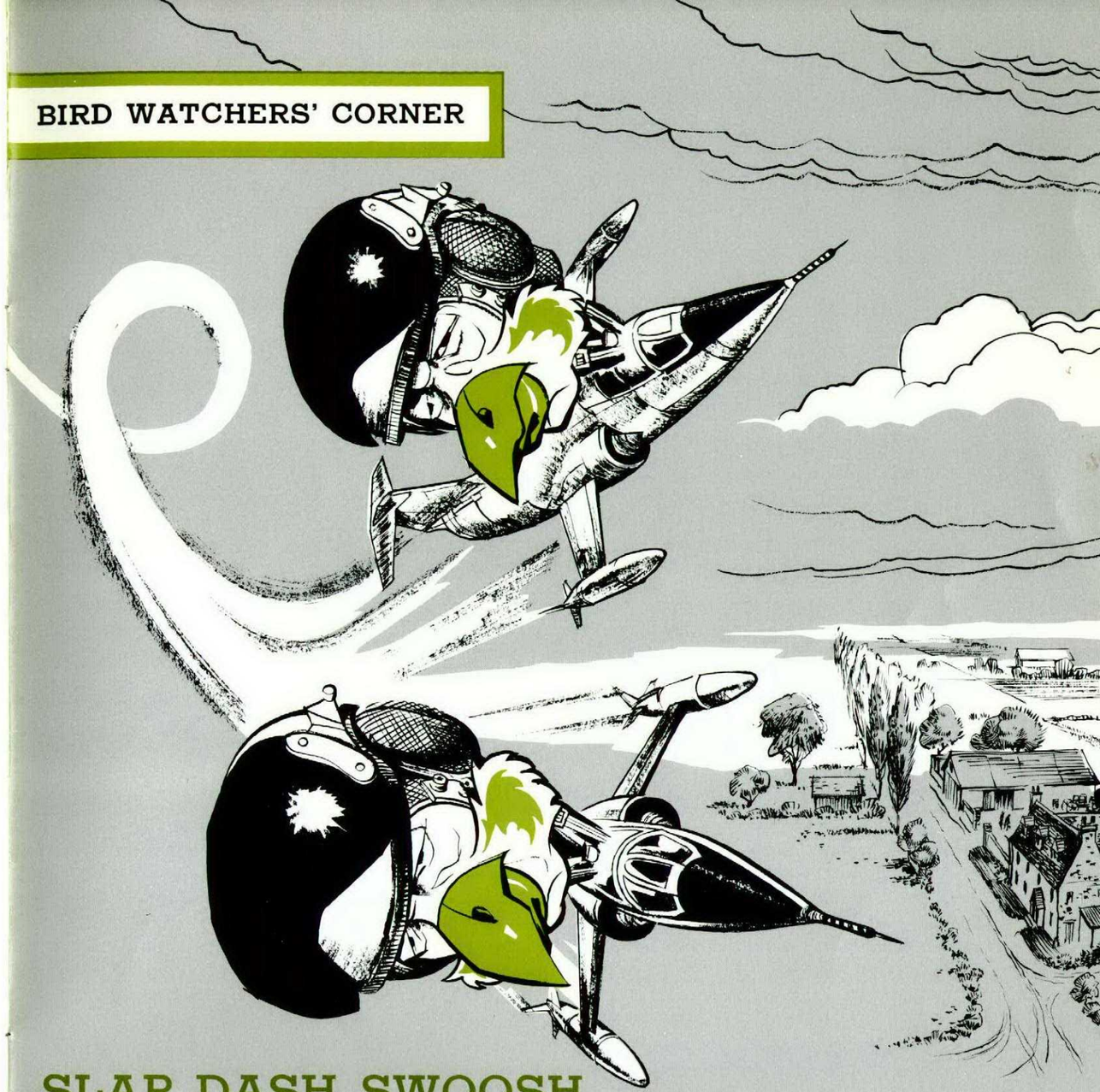


Type 3

BIRD WATCHERS' CORNER



SLAP DASH SWOOSH

Out of uncertain birdland skies swoops the Slap Dash Swoosh, a peculiar proliferating sub-species of the family Cee Eff Frustratus and close relative of the Schizophrenic Skylark. Once nearly extinct, its rejuvenation has baffled experienced bird watchers, as with increasing frequency they observe the telltale flight characteristics, chief among which is a penchant for engaging singly or in pairs, in impulsive, unplanned manoeuvres, patently inimical to its own well-being. These strange habits whilst airborne (which account for the short-lived existence of many) elicit endless speculation (but infrequent accord) from ornithologists as to the motivational influences responsible. One theory holds that the undisciplined activity arises from the questionable contention that operating with an inadequate margin of safety is from time to time acceptable in developing a high degree of capability. Another more common theory, links it to frustration stemming from misgivings about its future in birdland. Meanwhile, undeterred, the Swoosh flits about crooning its laconic birdsong:

WE'LLGIVEANYODDS THATWE'LLNOTLOSEMANYBODS

Need a poster?

FLIGHT SAFETY POSTERS

1970

This catalogue contains the posters - some old, some new - that are available from CFPD (Canadian Forces Publications Depot) Rockcliffe. Use normal procurement procedures, and employ the descriptive terms in this catalogue. Posters will be sent out on a first-come-first-served basis. This publication will be updated about once a year.

CANADIAN FORCES HEADQUARTERS — DIRECTORATE OF FLIGHT SAFETY

Apr 70)

Vérifiez
l'entrée
d'air

Nettoyez
Balayez
Ramassez