RCAF

FLIGHT COMMENT

MAY • JUNE • 1964

FLIGHT COMMENT

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Contributions, comments and criticisms are welcome; the promotion of flight safety is best served by disseminating on-the-job experience and opinion. Send submissions to: Editor, Flight Comment, AFHQ/DFS, Ottawa 4, Ontario. Annual subscription rate is $2.50 for Canada and USA; other countries $3.50. Subscriptions available at Queen's Printer and Controller of Stationery, Hull, P.Q.

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ACCIDENT PREVENTION

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ACCIDENT INVESTIGATION

Articles

Features

ROYAL CANADIAN AIR FORCE

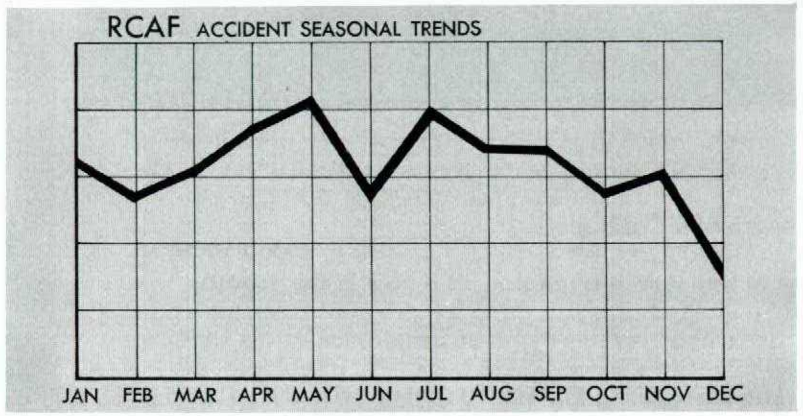
DIRECTORATE OF FLIGHT SAFETY

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1964

AB SEARLE GROUP CAPTAIN
DIRECTOR OF FLIGHT SAFETY

As these words are being written, snow veils the atmosphere, skies are grisly grey and freezing temperatures prevail. In short, a bad day for flying—particularly VFR. As you are reading this, we expect the sun is shining, the grass is showing green, golf clubs are out—a beautiful day for aviators. Too nice, perhaps, from a safety angle. Would it surprise you to know that the RCAF has its highest accident rate in the fine weather months? (the word "rate" takes into consideration the increased activities in spring and summer)

Right now we are reaching this annual peak of accidents, unless 1964 proves to be an exception to the last ten years. The small chart below shows the trend. We know this simple little chart won't keep the



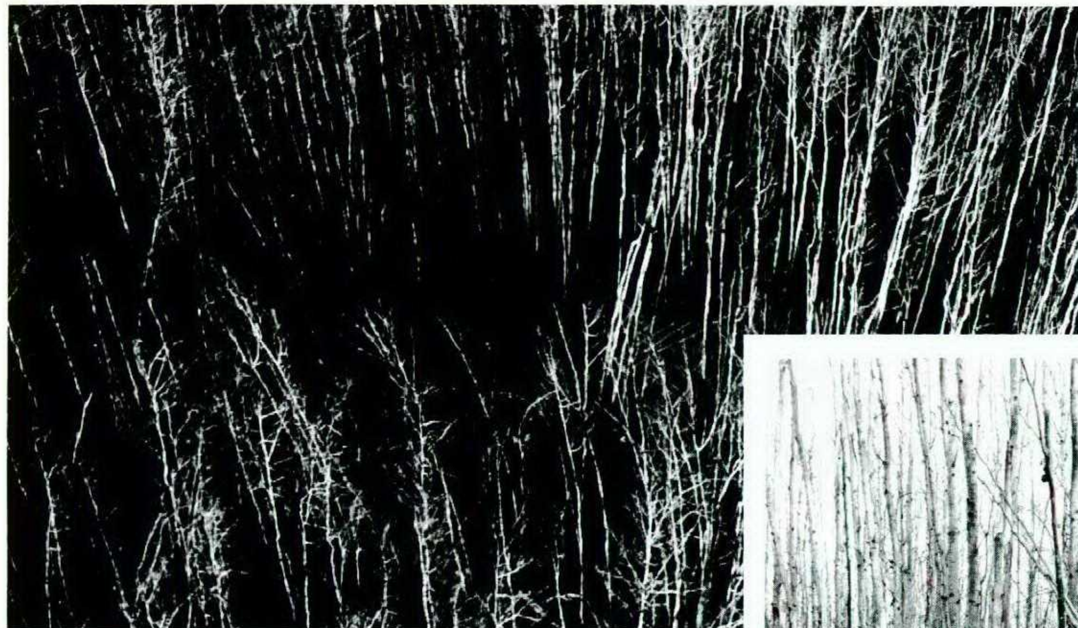
sun from shining but it might help to keep the accidents from happening. Fix this graph in your mind to establish a mental climate of caution and alertness.

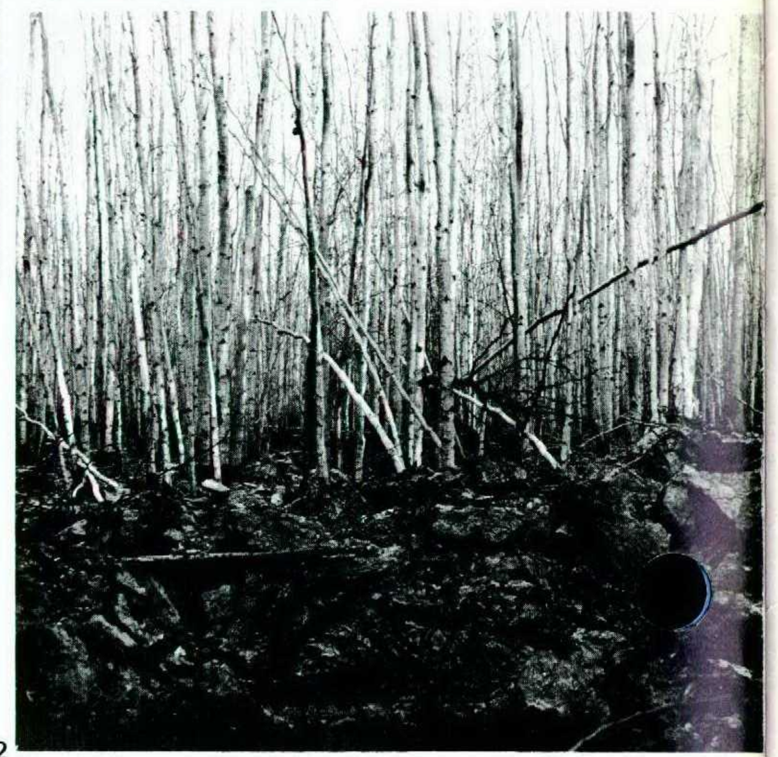
In early spring last year within 24 hours of each other, two pilots, 1,000 miles apart were killed because of unauthorized aerobatics at too low an altitude for their capabilities. An exuberant irresponsible attitude appears to be introduced into some pilots with the coming of spring and clear skies. Supervisors should be mindful of this and create an attitude of caution by counselling pilots of the dangers of over-confident good weather flying.

Adverse conditions may produce a few hardships, but a favourable flying environment which lulls us into a "got it made" attitude is our worst enemy. For example, during a four-month period while an RCAF runway was being repaired, pilots were forced to use a narrow taxi strip. Not an accident occurred during this time in spite of the poor approach area and reduced width of the landing strip. Why? Simply because the stress of using the limited space ensured the concentration of the pilots so that maximum care was used throughout the landing. The day the new improved runway went into use—landing accidents again began to take their toll.

You will find further evidence of this if you review the landing accident statistics during the past two years. You will note that the majority happened at aerodromes in regular use, seldom ever at the emergency or makeshift airstrips. Our most dangerous enemy then is a lack of caution and concentration when everything seems to be going perfectly, especially after a long session of sweating it out in miserable situations.

Some call it complacency, others, over-relaxation; whatever the name, this would be a good year to level off the curve in the chart by eliminating carelessness, negligence and disobedience of orders as causes of accidents during CAVU conditions.





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1 A/C 764 Crash site

2 On first sight it appeared as a hole in the ground

3 Excavation reveals depth of penetration of the wreckage

4 Inspectors sifting the debris

5 Remains of the engine

FROM AIB FILES

Aircraft	— CF104 12719	— CF104 12764
Date	— 27 May 63	— 1 Nov 63
Pilot	— F/L LA Tapp	— F/L CW Gehman
Injuries/Fatalities	— Very Minor	— Very Minor
AIB Investigators	— S/L RM Bauman	— S/L EG Smith
	S/L DL Campbell	— S/L DL Campbell

Circumstances—12719

On an initial acceptance flight at 28,000 feet the engine flamed out. The pilot attempted re-lights without success throughout the descent down to 2000 ft and then ejected.

Circumstances—12764

On a maintenance test flight at 5000 ft when the pilot retarded the throttle the engine flamed out. After an unsuccessful attempt to relight the engine, the pilot ejected.

In both cases the aircraft disintegrated on impact, and most of the engine components were deeply imbedded in the earth. After salvage was completed the examination of available evidence began. Although the investigation was hampered by impact damage of important components, the cause was eventually determined. In both cases, the contractors' facilities, RCAF Materiel Laboratory and National Research Council were most useful.

Flame-out occurred in both aircraft when the seal at the outlet of the main fuel control failed allowing a fuel leak. Although the same seal failed in both accidents, the cause of failure was different. In the case of 12719 it was determined that the studs securing the outlet line to the main fuel control unit had not been properly torqued and lockwired. In 12764, the bolts on the retaining flange had been properly torqued and lockwired but evidence was available, (as shown in photo), to indicate that the rubber seal was installed improperly and damaged on assembly.

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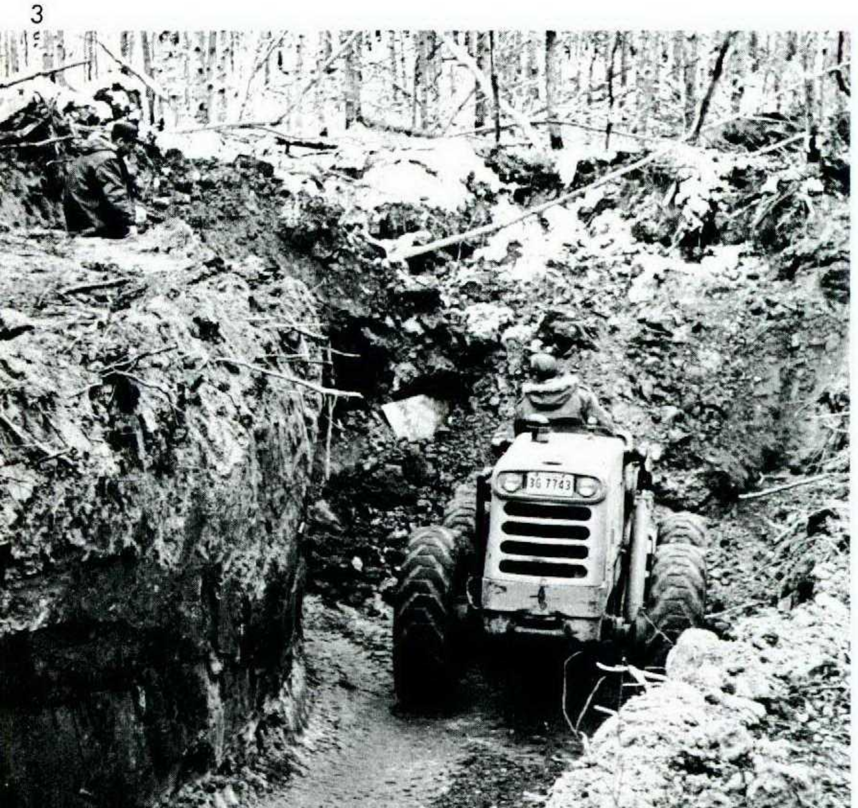

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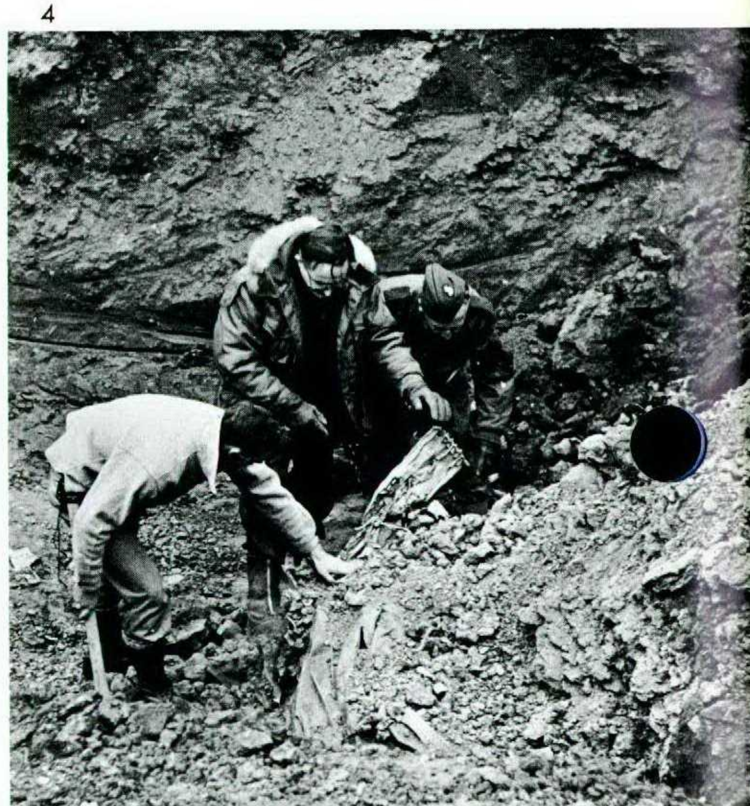

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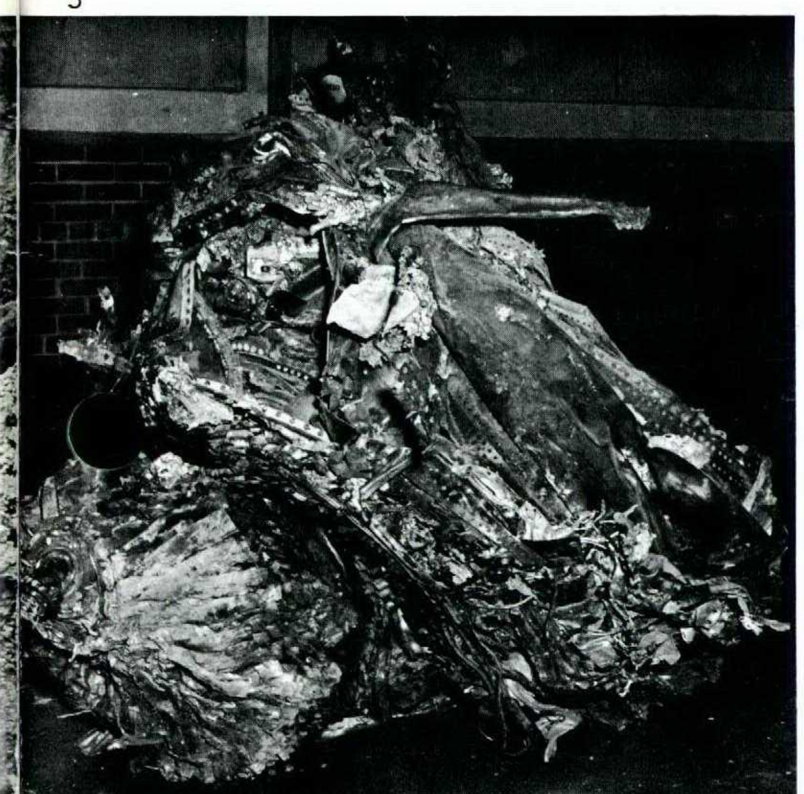
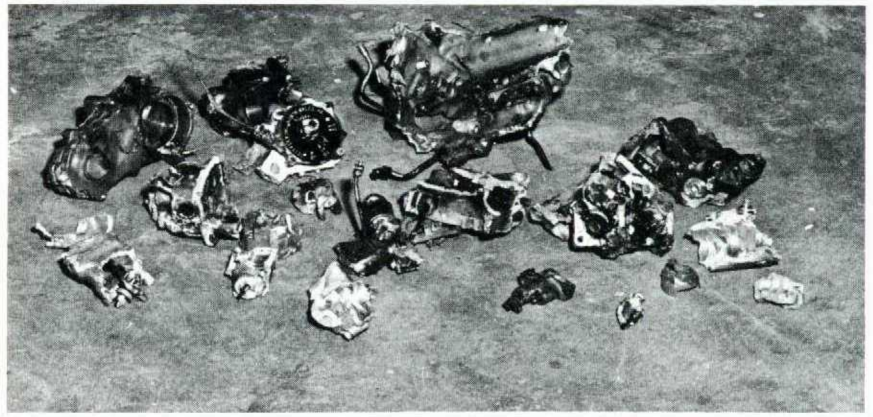


Investigation

It was determined by bench tests and ground tests of a J79 engine in the test cell that a leak rate similar to that which would occur with the failed seals, would drop the pressure sufficiently downstream of the main fuel control to allow the pressurizing and drain valve to close. This would shut off fuel to the engine. On the test, the engine flamed out. Thus, a flame-out would occur and a relight would be impossible. During these tests, the leak area was calculated to be 10.5 square millimeters. This figure corresponds very closely to the estimated size of the leak area in both accidents as shown in the photos.

Remedy

After the cause of the accident to 12719 was determined, all CF104 units were advised to check the fitting of the outlet flange on the main fuel control for proper torquing and lockwiring. However, this action failed to detect the problem in CF104 12764; the bolts were properly torqued and lockwired. Here the case was different; the seal had been damaged during assembly and the damage could not be detected without dismantling the unit. The immediate reaction after discovery of the misplaced seal on 12764 was "How many aircraft are flying in a similar condition?" Therefore, a Special Inspection has been issued, EO 10B-10C-5/11 18 Dec 63 ordering all seals at the main inlet and outlet ports of the main fuel control to be replaced.



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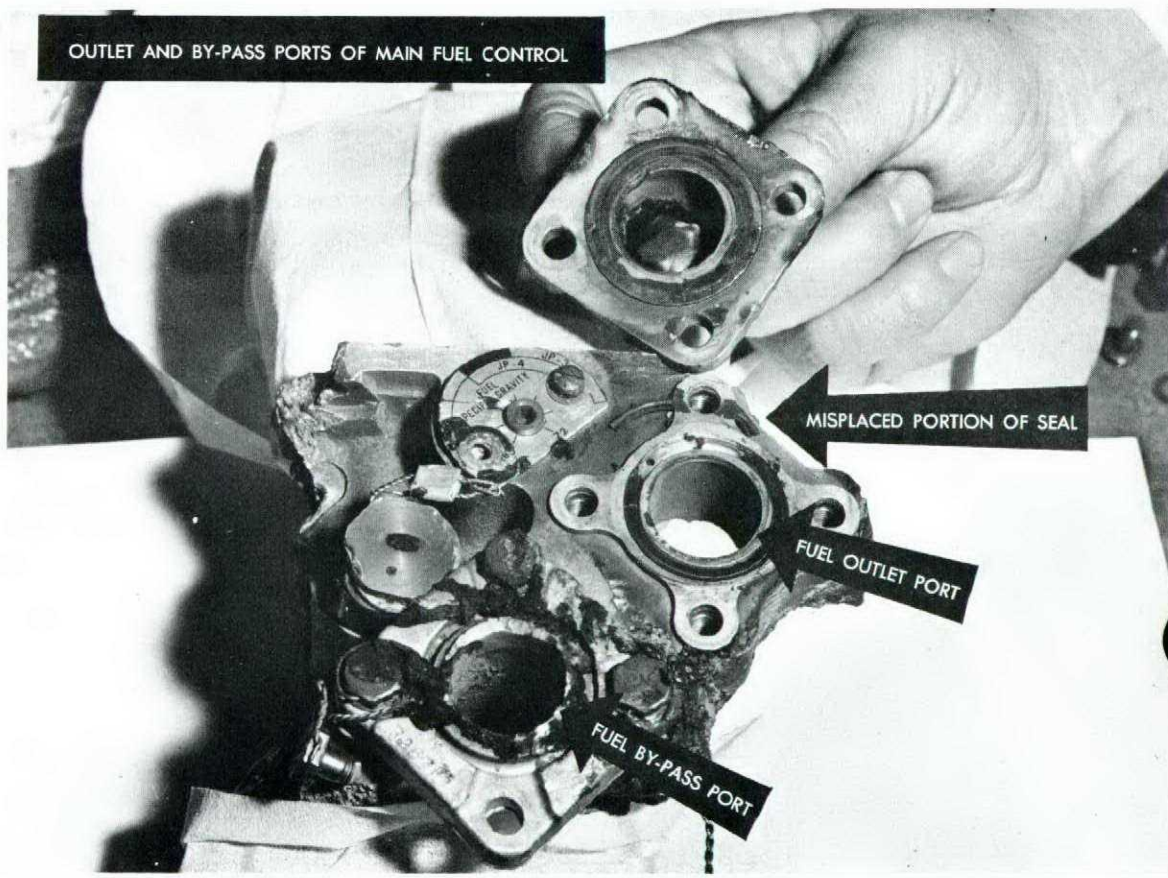
6 The main fuel control unit

7 The cause of it all

7



GOOD SHOW

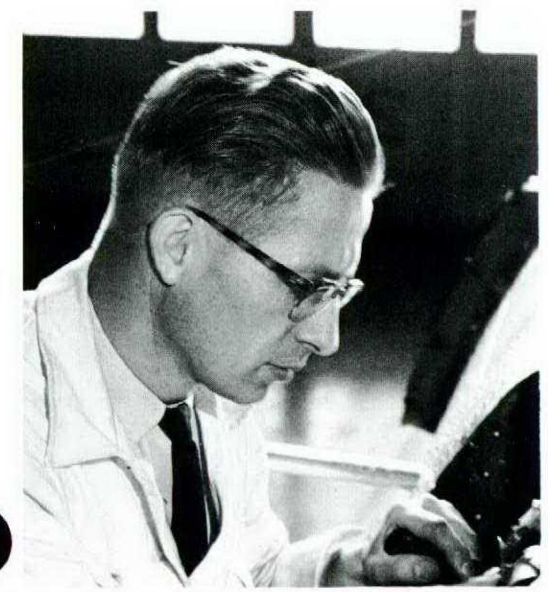
LAC HF SCHULZ

LAC HF Schulz, SE Tech, Stn Bagotville, was a passenger in an Argus. During the final stage of the flight, the pilot had an intermittent warning light indication that the main cargo door of the aircraft was not secure.

The pilot ordered the radio officer to check the door fastenings. Just as the radio officer touched the handle, the door flew open and he was partially sucked into the air-stream. LAC Schulz who was standing nearby, with great presence of mind and a disregard for his own safety, quickly grasped the officer and pulled him into the aircraft. He grabbed the officer's arm with his left hand and held on to a support with his right hand. He was not otherwise anchored to the aircraft.

There was a chance that LAC Schulz might have been dragged through the opening along with the radio officer. The bruised arm of the officer attested to the tenacity and strength displayed by LAC Schulz during the rescue.

LAC Schulz's bravery makes him a most worthy recipient of a Good Show.



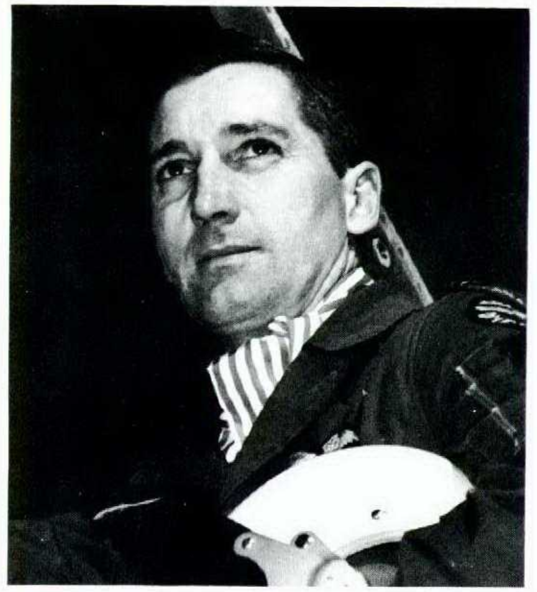
CPL SA PANICH

Cpl SA Panich, AF Tech, CEPE, Uplands, was detailed to pick up a CH113 helicopter aft transmission assembly from a civilian contractor. While waiting for the assembly which was being specially inspected, he visited the gear room to observe the operation. He noticed that the two apertures in the mix box case which mate with the oil inlet and outlet lines were plugged with plastic bags to prevent ingress of foreign objects. During the assembly Cpl Panich noted that the bag from the outlet aperture has been removed prior to the line being connected. He left the gear room before the other line was connected but on his return noted that although the assembly was complete there was no sign of the second plastic bag in the immediate work area. As he was a visitor he did not consider it politic to query the situation but decided to check the item on return to the station just to make sure.

Cpl Panich removed the oil drain assembly and checked the aperture with an inspection mirror; the bag was still in the casing. He then removed the filter assembly and withdrew the bag.

If Cpl Panich had not removed the bag it could have blocked the filter and stopped oil flowing to the upper part of the transmission.

By his alertness and determined action Cpl Panich probably prevented a serious accident and a major set-back to the introduction of the CH113 helicopter into service. Flight Comment is pleased to include this NCO in our list of Good Shows.



F/L GB SMITH

F/L GB Smith of 410 Sqn, Uplands, piloted a CF101B Voodoo to a safe landing at Val d'Or in very poor visibility when all landing aids had been knocked out by a power failure. A full account of this close call appeared in Flight Comment's previous issue. F/L Smith demonstrated presence of mind and precision of judgement in landing his aircraft safely in a close-call emergency.

Following this Near Miss he produced a written summary of an investigation he conducted at the station. This was instrumental in bringing to light the flight safety hazards inherent in the power supply situation at Val d'Or. In addition, F/L Smith (at the request of Flight Comment) produced a lively version of his Near Miss report which appeared in our last issue.

For flying skill, and a professional attitude demonstrated by his administrative follow-up we are pleased to include F/L Smith in our Good Show roster.

ARTISTS ALL

One of the reasons an aviation mechanic is so interesting to himself and to others, one of the reasons he is so important to everyone within his orbit, is that he is an artist. Do not deny or resist that statement. It is true.

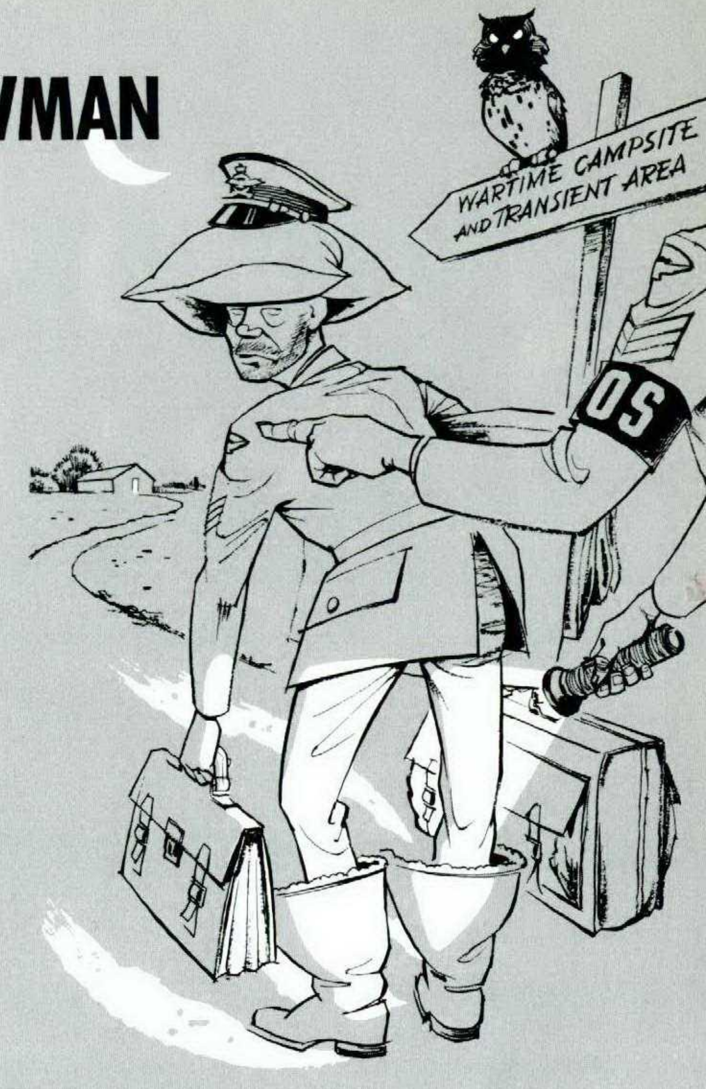
It is not necessary for a man to be a painter or a sculptor or a musician to be an artist. Every true mechanic is an artist. It is a matter of doing things well, in the very best possible way, and of finding the satisfaction and the happiness in the work itself, not outside it. Being an artist is not an outside, extra thing.

Rembrandt was a man of great understanding. He had the power of seeing deep into the significance of things. He had that power, that capacity, in abundance and so was a genius. But every good mechanic has that same capacity to a degree. Watch him trouble-shoot a malfunctioning electrical system.

Rembrandt was never a quibbling or uncertain man. Even early in his experience his work evidenced a positive nature occupied in great enjoyment. That too, is typical of the mechanic, knowledgeable, confident, forceful, fully alive, up to his elbows in the thing he likes.

Small wonder it is so interesting, so exciting to live in the environment of fine mechanics, — artists all.

THE TRANSIENT CREWMAN

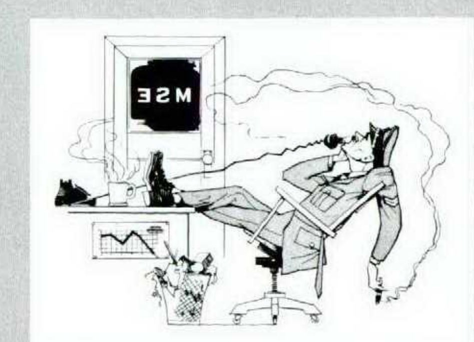


The over 1000 transient crewmen in the RCAF have a problem - that of being treated as foreigners at away-from-home bases. This "segregation" manifests itself in several ways, and extends from casual hostility to downright indifference. Recognition must be given to the fatigue and morale factors involved in the performance of crewman duties on often long and arduous trips, as potential flight safety hazards. The evolution of transient crewman accommodations practices in other air forces throws into stark relief the relatively primitive facilities existing at some present-day RCAF bases. For some reason or other many stations have failed to apply the spirit of AFAO 28.01/01 which defines the standard of accommodations to be provided for RCAF personnel.

The present-day inadequacies in transient crew accommodations stem from the piecemeal manner in which these requirements have been extended, this occurring with no basic policy defining minimum standards of accommodation; for example, transient crew quarters are often the responsibility solely of the Station Warrant Officer who may be obliged on occasion to make the best of limited resources. Place this situation against a background of understandable station loyalty in looking after its personnel first, and the picture emerges of vintage surplus-to-requirement dwellings being pressed into service for temporary shelter.

THE GENERAL PROBLEM

Transient crewmen are offered three basic services by host units: accommodation, transportation, and messing. Considering these services stem from various sections, co-ordination at the top is vital; a station may be praised for its accommodation, but lack of transportation results in a long hike spent in searching for the orderly sergeant and pressing on to distant buildings.



"Sorry, I'm the only driver on duty and I have to stay here to answer the phone!"

Accommodations. One of the chief gripes of transient crewmen is the fanatical zeal of some stations in the protection of their bedding! These precious items remain in the custody of the orderly sergeant and a signature demanded at all costs. In addition, unlike the SDO or OO who is obliged on most stations to meet all incoming aircraft, the orderly sergeant must be sought out to render assistance to crewmen. Rooms vary considerably from the well-equipped to the down-right primitive. The transient crewman may be confronted with a barnlike enclosure, housing many double bunks in which passengers (often partying), and overlapping shifts of other flight crews create an environment hardly conducive to relaxation and sleep.

Transportation. Here the situation varies

"Whaddya mean! who's going to wake us up at 4:30?"

from non-existent to good. The chief problem results from the various members of a crew departing the flight line at different times; the "third oiler" is often odd-man-out and makes it to bed "a pied".

Messing. The standards of messing vary undoubtedly with the resources available at different units, but late meals tend toward the inevitable: bacon and eggs. "The food's locked up", is the theme song for the late-late cook as he dispenses his midnight breakfasts.

THE SOLUTION

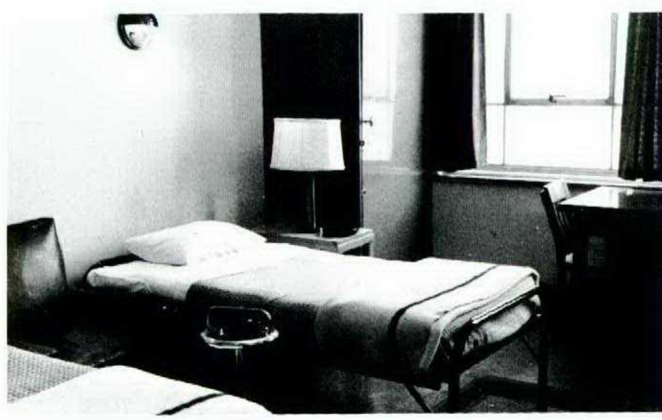
We've been living with this problem of transient crew facilities for two decades and reform is long overdue. If host stations would endeavour to assure adequate facilities and routines for handling visitors according to the minimum requirements outlined below, the transport activities of the RCAF would proceed in an environment conducive to optimum flight safety. These requirements involve:

- the provision of locked rooms in which clean bedding is placed. This obviates the exasperating search for the orderly sergeant and the signature ritual. The orderly sergeant is thus unburdened from the dispensing and receiving of bedding from crewmen departing at odd hours. A system in operation at Sea Island prior to its closing demonstrated the ideal solution as pictured in this article. Both meal card and key are exchanged at the flight line for the man's travel claim, the key being returned to the flight line on departing;
- the provision of separate rooms for transient crewmen so that overlapping shifts from other aircraft and pleasure-bent passengers (who may sleep the next day while airborne) are excluded;
- the provision of transportation on units where the flight line is distant from accommodations and the mess hall;
- the provision of adequate short-order food items other than bacon and eggs for off-hour meals and the abandonment of the requirement of having a man be in uniform before he is served; and
- the inclusion in orders that the orderly sergeant meet all aircraft to determine on-the-spot, the requirements of the crew for accommodation, transport and messing.

It can be done, the capacity to provide adequate facilities exists on all units. Altruistic considerations aside, the courtesy, care and efficiency with which we provide transient crew facilities promotes and enhances our ability to get the transportation job done well and done safely.

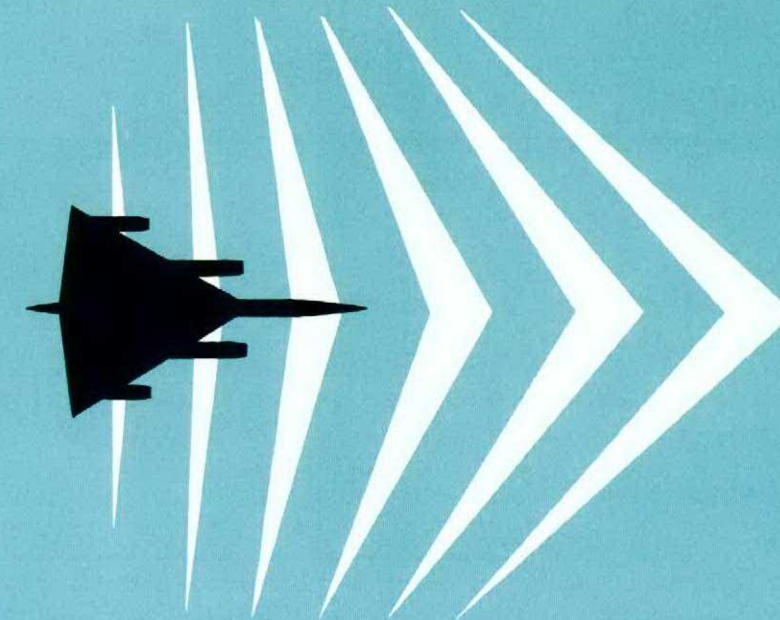
(Our thanks goes to F/L RH Goddard of 1 AFS, Rivers Camp, Man, formerly of 412 (T) Sqn, Uplands, who earlier suggested the theme for this article—Ed.)

THE KEY TO THE PROBLEM—A TRAVEL CLAIM IS SURRENDERED FOR A KEY TO HIS NIGHT'S ACCOMMODATION, COMPLETE WITH BEDDING AND PRIVACY.



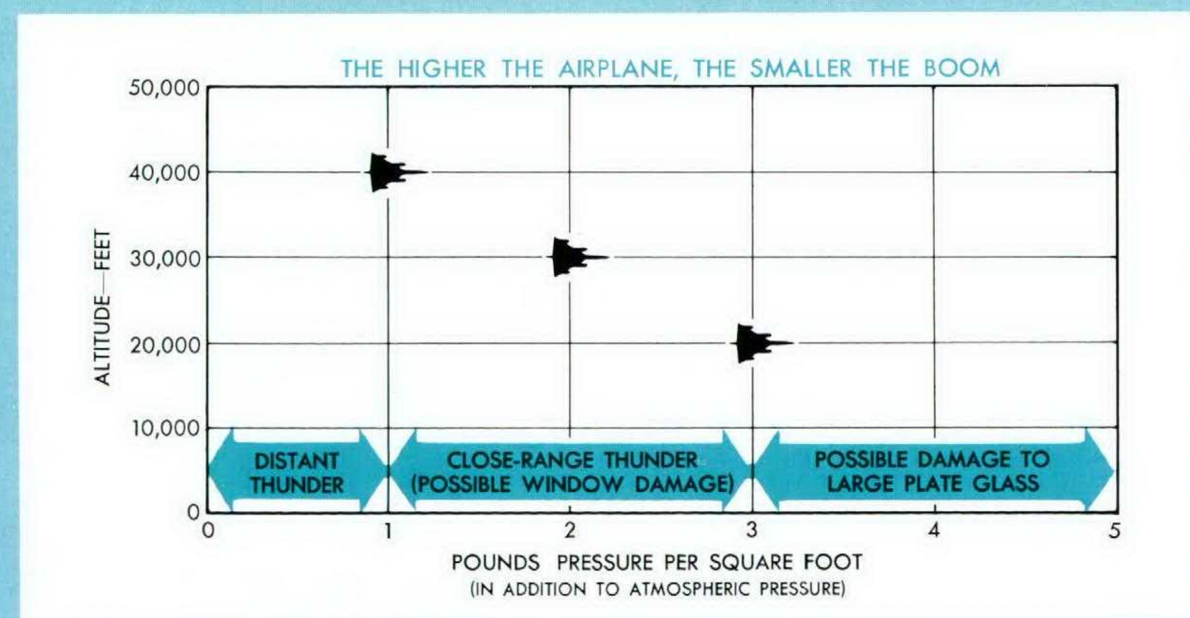
This station's transient crewman accommodations are of excellent quality. Is this typical?

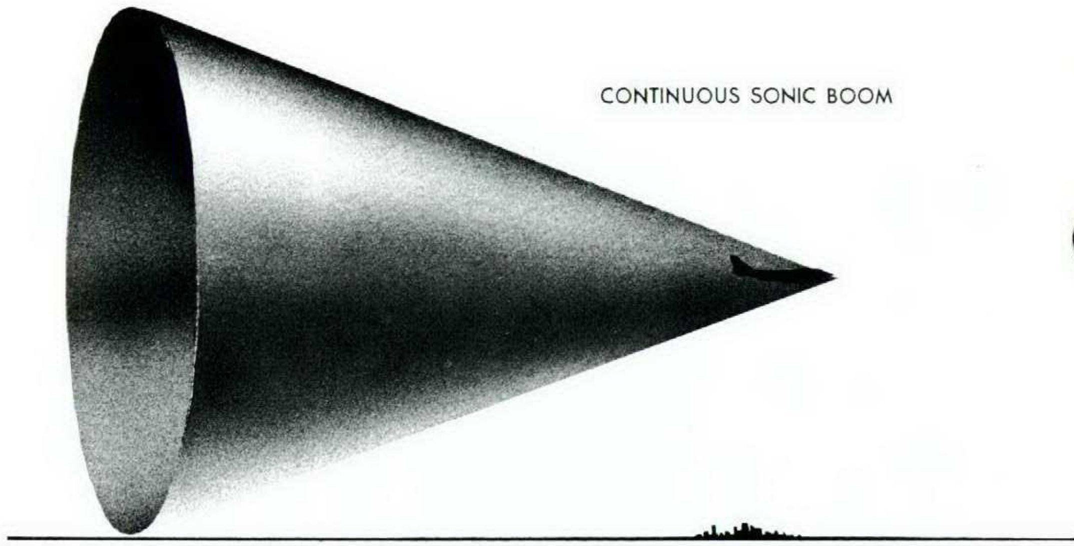
SONIC BOOMS



One of the most dramatic sounds associated with the present space age is the sonic boom. This phenomenon, which is caused by shock waves from an aircraft flying faster than the speed of sound, is very much like an explosion or as sometimes described by those persons who have heard it, man-made thunder. Though it does not affect the performance of the aircraft aerodynamically, the boom does seem to have an effect on the acceptance of supersonic aircraft by some people. This lack of acceptance can be overcome by furnishing these persons with certain facts explaining the unusual noise, thereby helping them to better understand why there is no need for apprehension or fear of the sonic boom.

The shock waves or sound waves that cause the boom are actually a result of energy surges - very much like the ripples which are created by a stone tossed into a calm body of water. Another parallel is our ordinary conversation which actually is a series of small pressure waves pulsating against our eardrums and translated by our brain as intelligible sounds. An aircraft flying at 35,000 feet, for example, pushes and piles up billions of air particles, which it encounters at speeds above that of sound - 660 miles an hour at this altitude, to a



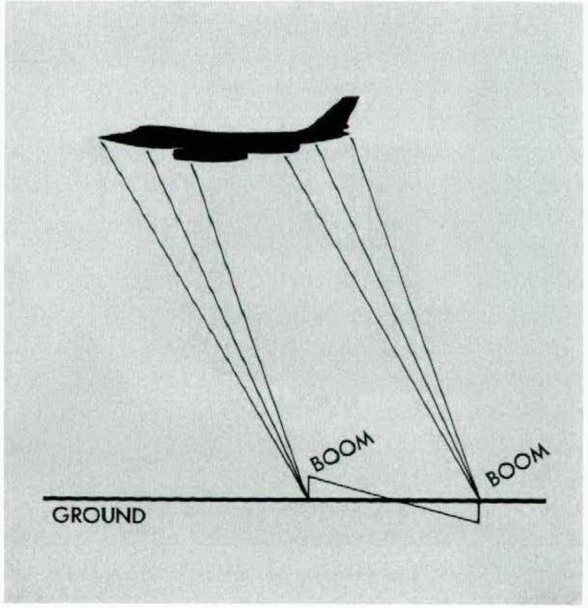


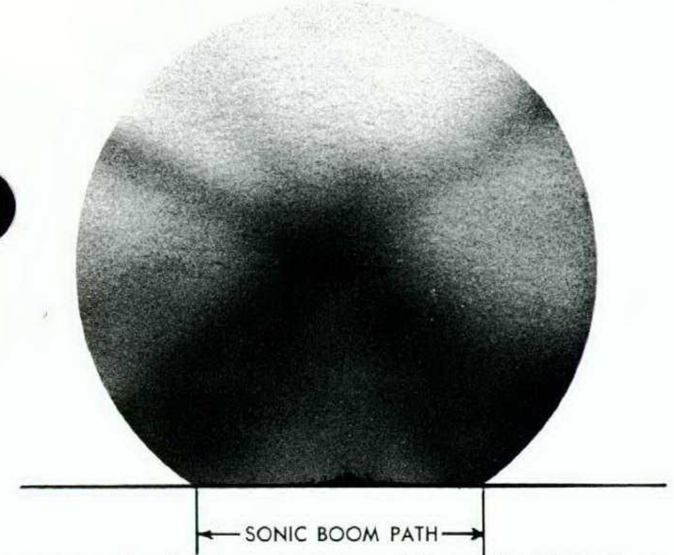
point where the air pressure is changed considerably. This change encircles the aircraft in the shape of a cone which is dragged along with the airplane as long as supersonic flight is maintained. The smallest part of this cone is near the front of the airplane flying faster than the speed of sound and the cone becomes larger as it trails behind. The waves spread out in all directions, exerting a pressure pulse as they pass. As the lower edge of the cone is dragged along the ground, the pressure pulse is heard as a boom. The width of the path along which the boom is heard will vary from a few miles to 50 or more, depending upon the altitude of the aircraft and its speed, the wind, temperature, humidity, terrain, and other factors.

It can be truthfully stated that the sonic boom is in reality a natural product of supersonic flight. Its intensity, however, is governed more by the altitude of the aircraft than by its speed. In other words, the higher the aircraft flies, the weaker the boom.

On the basis of actual test data, an aircraft flying at supersonic speed at an altitude of 40,000 feet will create booms with pressures of about one pound per square foot above normal atmospheric pressure. These booms would sound like distant thunder and would normally cause no property damage whatsoever. At 30,000 feet, a supersonic aircraft would create booms with pressures ranging about two pounds per square foot and would sound like close-range thunder. These could possibly break some window and plate glass, if the right conditions were established by the speed of the airplane, wind, temperature, terrain, and so forth. Pressures of about three pounds per square foot would be created by a supersonic aircraft at 20,000 feet. These would sound like an explosion and could possibly break some large plate-glass windows, especially if the glass had flaws or built-in stresses. Except in very rare circumstances aircraft are not flown at supersonic speeds below 20,000 feet.

Structural damage on the other hand is an entirely different matter. It is a fact that scientists and engineers interested in shock waves have never observed any structural damage to even the flimsiest of test structures at pressures below 70 pounds per square foot. This is 20 times more pressure than a boom from 20,000 feet. Even more interesting is the fact that scientists have not been able to generate sonic boom pressures of more than 70 pounds per square foot except under the severest of test conditions. Such pressures of more than 70 pounds per square foot were generated when a supersonic interceptor sped by only 2000 feet above a ground recording device.





As tests indicate that 70 pounds of pressure are required to damage even the flimsiest building, and since military aircraft do not normally fly supersonically below 20,000 feet, it is very unlikely that structural damage on the ground could be caused by aircraft flying at supersonic speeds.

The number of booms that are heard while the aircraft is flying at supersonic speeds will depend upon the number of shock waves which reach the ears of the observer. It is possible to distinguish two booms from a single aircraft. The first boom would be the result of the bow wave and the second the result of the tail wave. There is some indication that a time interval of one-eight of a second between the waves is necessary to discriminate between the two sounds. Intermediate waves from the wing, canopy, and so forth, merge with the strong compression shock waves of the bow and tail and therefore are normally not heard.

In all probability, the most disturbing elements of the sonic boom are its unexpectedness and suddenness. During a storm, a person generally prepares himself for the loud, sharp, and abrupt noise of thunder because of the flash of lightning which precedes it. However, that same person normally is not expecting the loud report of a sonic boom and for this reason he becomes quite startled by it. Even though disturbing at times, it should be accepted just as the sirens of ambulances, fire-fighting vehicles, and police cars; the roar and whistles of speeding trains; the rumble of trucks, and other common present-day noises.

B-58 HUSTLER NEWS REPRINT

WEATHER TESTIMONY

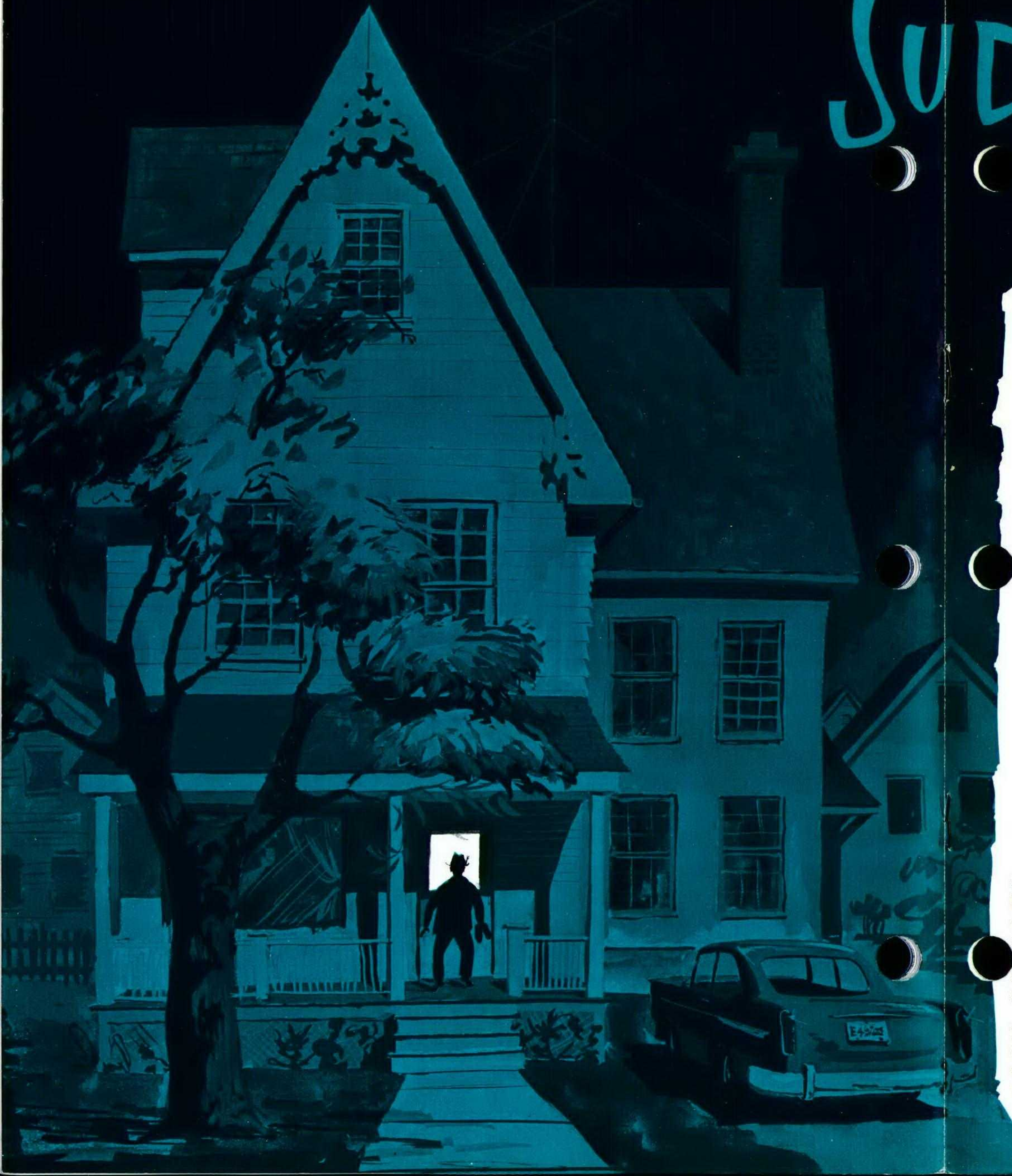
Testimony given by CF Van Thullenar, Director of National Severe Storms Project, disclosed this background information:

- NSSP aircraft have made 295 penetrations and spent 1,035 minutes in thunderstorms;
- Strongest updrafts encountered had vertical lift of 208 ft per second; vertical downdrafts of 360 ft per second were encountered, although extremely uncommon;
- Heaviest turbulence is in darkest portion (heaviest rain areas) of cloud formation;
- Turbulence increases with altitude and with the diameter of the thunderstorm cell, and is greatest in the buildup and early mature stage;
- Pre-frontal thunderstorms, caused by a combination of low-level convergence and heating, are most vicious;
- Funnels beneath thunderstorms of severe intensity generally terminate at or slightly above the base of the major portion of a buildup;
- Normally, downdrafts are encountered on the perimeter of the storm, with updrafts in the center. However, within each there are opposite direction gusts which help create turbulence.

Mr Van Thullenar reported that in the 1962 T-storm study, severe turbulence was encountered once every 20 miles of flight, and extreme turbulence once every 50 miles. As he stated it, "In any thunderstorm worthy of the name, you can experience severe turbulence if you are in the right place at the right time". Severe turbulence is when vertical movement is 35 to 50 ft per second; extreme turbulence exceeds 50 ft per second. Maximum turbulence is normally found on the upwind side.

FLIGHT SAFETY FOUNDATION

JUDGEMENT & DUCKS



STEALING HOME after a late poker session, George doused his car lights, switched off the engine and coasted silently and darkly into his drive. That's DISCRETION.

He removed his shoes on the porch, inserted his key in the well-soaped lock and opened the door on hinges that had been oiled that same afternoon. That's PLANNING.

Without faltering, he walked through the living room to the hall and up the stairway, counting his steps as he went. After exactly 53 steps, he stopped, turned and crept silently into the bedroom. He stripped off his clothes and folded them over a chair. His hands found the right drawer in the dresser, opened it and brought out his pajamas. That's KNOWLEDGE, PRACTICE, and EXPERIENCE.

George donned the pajamas, carefully folded the covers back on his bed and lay down. As his head touched the pillow, the bedside lamp came on and his wife sat up.

"George, what time is it?"

He grabbed the clock from the table between them and pretended to stare sleepily at it while he wound the hands from 3 am back to 11:30 pm Yawning widely, he held the clock out for her to read. That's THINKING.

Whether he knew it or not, George was demonstrating some pretty fair judgement. But if you asked him to define good judgement, chances are he'd stammer around considerably and still come up with an unsatisfactory answer. I know, because I've been trying to describe it in simple terms for several weeks. Believe me, it isn't easy!

We've all heard gray haired aircrew tell how they learn something new each flight. Certainly, knowledge and experience are necessary parts of good judgement. But a very wise man once said, "Knowledge and experience are what you think you have until you get more of them".

The January issue of the ARMY AVIATION DIGEST carried an article entitled "Knowledge is the Key to Success". It was an excellent article, but I believe a better title would have been "Knowledge is a Key to Success," and this should be further qualified to require that the knowledge we have be put to use. Any key gets rusty if we hang it on a nail and leave the door locked.

Take Henry, for example. He was at the same poker session with George, but he no sooner cracked the front door than he was faced with an angry wife. Though he had been married ten years to George's three, Henry failed to put his knowledge and experience to use. Another example with far more serious consequences involved a pilot with seventeen years experience and 4,741 flying hours. Despite this pilot's background of experience and knowledge, he attempted a flight in the face of a severe weather forecast which called for thunderstorm activity and moderate to heavy icing from the ground up along his route. The aircraft disappeared and has never been found.

These examples prove to my mind that knowledge and experience are not the complete answer. What is it?

Perhaps one way to learn about good judgement is to discuss what it isn't. Certainly good judgement does not include ....

OVER CONFIDENCE

This bugaboo has been the subject of many accident studies. Records seem to substantiate the premise that the 200-500 hour level of flying experience is the most dangerous for us all. From the time we win our wings until we build up enough experience to find out how little we really know, most of us would try flying a barn door if we could find a way to propel it.

A good picture of this type was the pilot who reported to his first unit, bringing a wife and two children, but no personal insurance. Asked what coverage he had, he bragged to his associates that insurance was for the birds.

The last of this pilot's career was written during a night flight a few months later. His wife now faces an almost impossible struggle to keep her small family together while working to support them. Overconfidence - so great that this pilot was willing to risk his family's future on his limited ability.

COMPLACENCY

Closely akin to overconfidence and often resulting from it, complacency affects us all to some degree. It's a very human trait with symptoms we often recognize in others, but just as often fail to acknowledge in our own makeup. Two of these symptoms are inadequate planning and failure to keep informed. Ever caught yourself at the end of the runway wishing you'd spent a few more minutes planning your flight?

Thousands of words have been written about how hard it is to keep informed on the dual fields of branch qualifications and flying. Granted, it isn't easy. But it's a fact of life in the Air Force - one we'll have to live with, and it can be done.

The pilot who had a series of incidents followed by a minor accident, all due to poor judgement, wouldn't admit to complacency. According to him, it was just bad luck that he happened to be in the wrong place at the wrong time. He spent a great deal of time explaining this to his associates. If he had spent this time trying to find a way to correct his judgement, he might have avoided the final major accident that cost him his life.

FEAR

Fear, like complacency, is a trait few of us willingly admit. There may be aviators who have never been afraid while flying. If so, they have a far more serious problem than the rest of us because, according to the psychologists, they aren't human.

Unlike complacency, fear is a desirable trait up to a certain point. Here are some quotes from the May 1961 issue of APPROACH, The Naval Aviation Safety Review, that help to tell why:

"It is particularly true that situations that are filled with intense personal danger are invariably accompanied by fear", the authors of "Survival in Water" write. Fear is the body's way of providing an emergency response to an unusual or unexpected stress. It stimulates the individual physically and mentally for the purpose of better preparing him to cope successfully with the danger that confronts him. However, depending on the makeup of the individual, his early background, training, and experience, and the training he has had in the job he is doing, he is able to accept the fear and all of the discomforts which go with it or he is panic-stricken by anxiety and is rendered ineffective.

"Familiarity, experience, and training act as buffers and protect the individual from a disorganizing psychological response .... A trained and seasoned man has greater flexibility and is able to bend with the stress, so to speak, without breaking. Conversely, unfamiliarity, inexperience, and a poor quality of training or too little training are major causes of abnormal mental and emotional reactions".

"As one Navy flight surgeon told his pilots some time back, 'The only way you will be able to survive an emergency is to have a tailor-made reaction for the situation prewired and planted in the dusty recesses of your skull, ready to transmit as soon as the button is pushed. If you don't have one, that button will activate another standby circuit which is very effective indeed. The name of the other circuit is PANIC.'"

DESTINATION FEVER

We've all heard and read about aircrew who were so anxious to get somewhere that they left all signs of good judgement at the airfield gate. The highly experienced pilot mentioned earlier was one of these; he was in a hurry to get home for the week-end.

I heard of another aviator who took off in zero conditions and flew between two mountains that were higher than the altitude capability of his aircraft. Through a miracle he made it. Where was he going? To see his girl friend.

DOMESTIC PROBLEMS

Married men who never have domestic problems are in the same category with aircrew who never experience fear: they're both freaks of nature. And please don't skip over this section just because you're single. A spat with your girl friend can be just as troublesome. The only difference is that you don't have to gnaw your way through burnt toast the following morning.

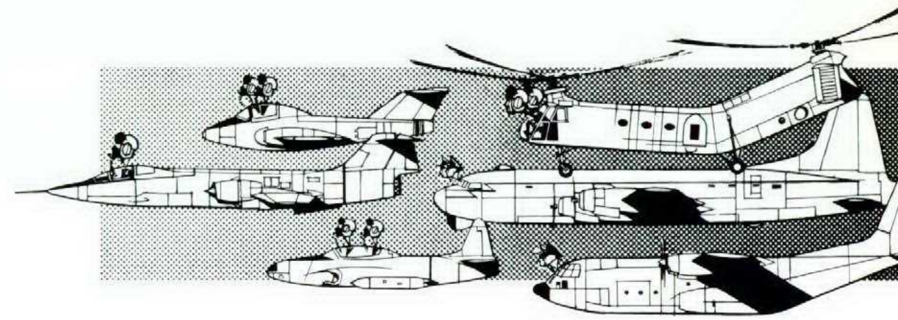
Though it's usually hard to get accurate information on what part domestic problems played in causing accidents, cases are on record in which it was proved beyond all doubt. And this is an area the medical member of an investigation board is called on to probe thoroughly.

The difference between an aircrew officer who shows good judgement in the face of domestic problems and one who doesn't is easily recognized. The first leaves his problems at home while the other carries his to work. This wouldn't be so bad if he'd include them in his preflight and shake them off with the pitot cover. The trouble comes when he takes them into the cockpit and attempts to divide his attention between his problems and flying. Most of us aren't blessed with the multiple track minds required to handle both.

These are a few of the problems which hinder good judgement. There are many others - job pressure, over-anxious desire for recognition, fatigue, ad infinitum. Like Air Force Major General Joseph D "Smokey" Caldara said: "Our accidents rarely result from some great dramatic catastrophe, but from a series of piddling coincidences that snowball to disastrous proportions. It's a case of getting nibbled to death by ducks. You're not being bitten in half by an alligator and you've got to think in those terms. Take the time to kick the ducks away".

George knew how to kick the ducks away. How about you?

Captain Howard R Foster
US ARMY AVIATION DIGEST



HEADS-UP

On a training flight at CJATC, Rivers, the captain, F/L JER McMillan retarded the starboard throttle to simulate an engine failure. To simulate feathering the engine the student pulled down the feathering button guard and the emergency drill was completed. The guard was then returned to the "UP" position but the engine began to lose rpm through feathering. F/L McMillan by way of experiment, retarded the throttle to analyze the cause of feathering and it was later shut down. It was quickly ascertained that the feathering button had vibrated out of position enough to feather the propeller when the guard was returned to the up position. The button was screwed back into position and the engine restarted.

F/L McMillan took advantage of his being near the airfield to carry out his experiment safely; in fact, his quick assessment of the situation resulted in less than two minutes power loss. This was Heads-Up flying of the best order.

F/L TS King was captain of an Argus which had been airborne for an hour and was flying at 2000 ft, 175 kts. A sudden jar was felt by all on board and an inadvertent undercarriage lowering or bird strike was suspected. However, the starboard wing dinghy had discharged and was draped around the starboard tailplane. Some damage to the leading edge of the tailplane was evident but apart from a slight yaw, control was unimpaired. Speed was reduced, a flap lowering test was made and the aircraft landed without incident. F/L King's assessment of the situation coupled with his knowledge of the aircraft control system led to his competent handling of the situation. This was a fine example of Heads-Up flying.

MAKE NO MISTAKE...

"Somebody on the ground must have goofed. This was the unhappy thought that struck me when I discovered myself drifting down under a silken canopy, terminating a CF100 test flight. I was the navigator. The initial part of the airtest was uneventful except for a few minor unserviceabilities. We got to the place on the card which called for a rapid descent to 15000 feet with a maximum positive "G" pull-out, followed by a bunt for negative "G" loading. Suddenly my head was pushed against the canopy and at this time I heard an explosion followed by a whistling sound. My impression was that we had lost our pressurization. Then maybe two or three seconds later I heard another explosion. I saw the canopy rail sliding by and immediately after, I was hanging from a parachute. At the time we were around 16000 feet. I glanced down at my feet and there was a village right under me. I pulled the emergency O2 bottle and tightened my mask. I felt pressure in the mask. I was also swinging violently from left to right ..."

Imagine the surprise of this navigator when he found he had been involuntarily ejected from his aircraft and the amazement of the pilot to find he had lost his navigator. The navigator was fortunate to have escaped serious injury. It proved the efficiency of the seat itself, but not so the efficiency of the supervisory personnel in this instance and the safety equipment technicians who were responsible for the installation of the seat.

The Board of Inquiry discovered that a lead seal had lodged between the flanges of the main ejection guns in both seats so that they were not locked to the cockpit floor. With negative G both seats rode up the rails. The navigator's seat drogue chute fired and yanked him from the aircraft! The pilot's drogue chute also fired but fortunately it severed before he too was pulled out of the aircraft. He did however, go halfway up the rails so that his head and shoulders were exposed to the slipstream. When negative G was relaxed, his seat fell back into position. Gingerly, he flew the aircraft back to base and landed safely.

The Board concluded that the accident would have been avoided if proper maintenance and installation procedures had been followed and supervised.

Another Board of Inquiry investigating a T33 bail-out, reports: "The cause of the pilot's death is attributed to failure of the safety equipment to function as designed. His parachute did not deploy". It was discovered that an unauthorized plate had been attached to the flap covering the power and rip cord housing. The adjustment of the length of the power cable was also incorrect and not done in accordance with EOs. All these factors indicated improper maintenance which resulted in the malfunction of the parachute.

Another case: aircrew seriously injured. At the end of a routine target exercise in a CF100, the aircraft was set up for a cruise descent, from 38000 feet. GCA positioned the aircraft downwind with cockpit check complete - fuel checked, wheels down and 25° flap. The pilot was instructed to descend from 1500 to 1300 feet. IAS was 150 kts. But while still at 1500 both engines flamed out due to fuel mismanagement and when they could not be relit, the pilot called an emergency and ordered the navigator to eject. He immediately pulled the face blind "D" ring which jettisoned the canopy but failed to eject the seat. He then pulled the alternate "D" ring and this also failed to eject the seat.

The pilot hearing the "bang" of the initiator assumed the navigator had left the aircraft and pulled his face blind "D" ring free of the seat. He had pulled it out far enough to fire the canopy initiator when he discovered his navigator could not get out. He stopped in the midst of the sequence and decided to try a forced landing. He left the undercarriage down, reasoning that a wheels-down landing would be safer. The aircraft landed in a stubble field, skidded, struck a ditch, destroyed a small building and came to rest against a concrete-block barn. The navigator extricated himself from the wreckage, removed the roof of the building from the front cockpit and rescued the semi-conscious pilot. Both aircrew were injured but it is a miracle that they escaped alive. The aircraft was broken into three separate pieces.

On investigation it was revealed that all components were serviceable, the correct type, properly installed, and tolerances within limits specified by EOs. What went wrong? It was discovered that applicable EOs did not call for a functional test of the assembled seat in the aircraft. The test of each component separately is done in the SE section but problems caused by numerous cables, connectors, etc, would never be discovered unless a functional check was conducted with the seat in the aircraft and all parts connected.

So far there have been only a few failures but there is a continuing need for special care in the maintenance of safety equipment. The increasing complexity of the escape system, incorporating rocket catapults and man-seat separation, dictate an urgent need for greater emphasis on diligent maintenance.

There have been a few cases where the automatic parachute opening device did not function, obliging the aircrew to manually deploy the parachute. It was shown in one case, that the EOs did not specify that the clearance of the timer should be checked. In another instance, during normal maintenance on an aircraft, the lap belt initiator on the copilot's seat was fired as the seat was being pulled to remove time-expired items. The technician failed to follow the check list for removing the seat.

Everyone concerned with escape systems must realize his responsibility. The importance of referring to and following instructions outlined in the EOs should be forcefully impressed on supervisors and technicians to afford a reliable and fool-proof means of escape during an emergency. An ejection system needs only to work once and aircrew hope that even that once won't be necessary. But if it is, there must be 100 per cent guarantee that it will work. An aggressive maintenance and inspection program is mandatory.

During the past four years the RCAF has experienced over 90% successful ejections. This proves the efficiency of our escape systems but diligent maintenance is essential. Each part of the ejection system must be installed as though someone's life depended on it—it does.

LAND AND SEA BREEZES

Our coasts and lakeshores can produce some freakish and dangerous weather for the unwary . . .

There's nothing like a hot day at the beach - when there's a breeze - but while the vacationer lies there bronzing his back, the meteorologist and aircrew are having to contend with a Pandora's box of tricky weather situations. Coastal areas are notorious for abrupt weather changes and marked vertical wind shears of particular significance to aircrew. These changes centre around the land and sea breeze phenomena.

The Sea Breeze

Land and sea breezes are caused by the differential in heat absorption between land and water. During the day, the land heats readily; as the soil is warmed so is the air adjacent to it. At sea, much of the sun's heat penetrates the water; with the constant mixing of the surface layers of the sea, only a slight warming of the surface occurs. Thus the temperature of the air over the sea remains relatively unchanged.

As the air over the land heats, it becomes less dense and rises, spreading out and overflowing the sea air. This upper flow out to sea is matched by a surface flow toward the land - the sea breeze. Put into meteorology's parlance, a high pressure area is created over the sea by land air flowing seaward at upper levels. Due to the relative low pressure over the land, a wind blows from the sea to the land. This pressure gradient between the two areas increases as the temperature differential increases, which means the hotter the day the stronger the wind. Sea breezes over 60 mph exist in the tropics, whereas 15 to 25 mph is more common for the temperate zone.

The Land Breeze

At night a reverse phenomenon takes place. The land cools rapidly to a point which results in the sea being relatively warmer. The land air being cooler and denser will flow toward the warmer, less dense sea air. These offshore land breezes are not as intense since temperature differentials do not exist to the daytime degree.

Tricky Flying Weather

Winds. Although these winds do not normally reach high speeds in our latitudes, they are far from insignificant. Land and sea breezes, combined with general pressure gradient winds, cause considerable concern for aircrew, the forecaster and air traffic control officers at airfields near the sea coast or large inland waters. There may, for example, be several changes in the runway in use over relatively short periods of time.

Observations of winds below 2000 ft in coastal belts during fine summer days can present a rather confusing picture since the winds may be opposite to the pressure gradient flow or be supplementing it. Let us suppose that the normal pressure gradient creates an offshore wind of 10 mph, and in the afternoon an onshore wind of 10 mph occurs. Theoretically, this sea breeze would have reached 20 mph since it overcame the pressure gradient force of 10 mph and produced a flow of 10 mph in the opposite direction. Conversely, an onshore gradient wind under such conditions would result in a 30 mph onshore flow. This demonstrates that wind measurements in the lower levels along a coastline may not be representative of the general area. For aircraft flying through coastal area, drift readings should be taken either out to sea or well above 2000 ft.

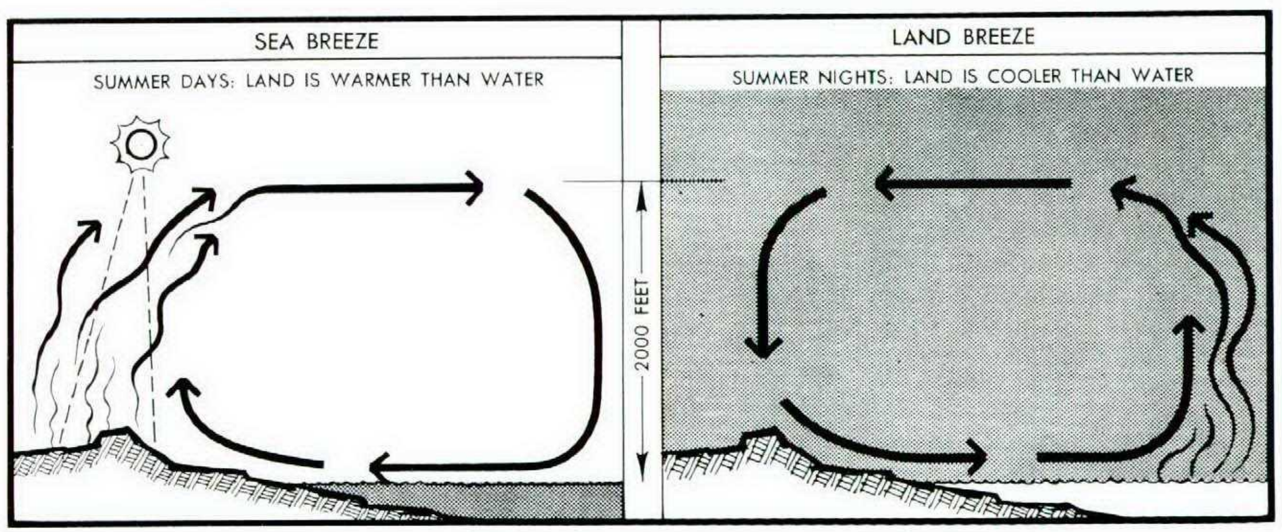
Fog. When warm moist air flows over the comparatively cold water of the Atlantic, south of the Nova Scotia coast, large fog banks form and may persist for several days. The sun may burn off the fog inland along the coast during the day and be strong enough to set up a sea breeze. Just the right combination of gradient wind and sea breeze can carry the fog across the coastline several times during an afternoon. Similarly, at night the combination of gradient wind and land breeze determines, to a great extent, the time at which fog will move across the coastline.

Other Effects. Sea breezes lower the maximum temperature along coastal areas. Normally, the maximum temperature over land is registered about mid-afternoon. However, a sea breeze springing up during the late morning with its inflow of cooler air from the sea, will advance maximum temperature time several hours, and lower its value by a few degrees. This damping of maximum temperatures can inhibit the instability necessary for the formation of cumulus cloud. Thus, it is common to see cumulus cloud, or even heavy cumulus with showers, ten miles inland beyond the effect of the sea breeze, with a clear sky at the coastline.

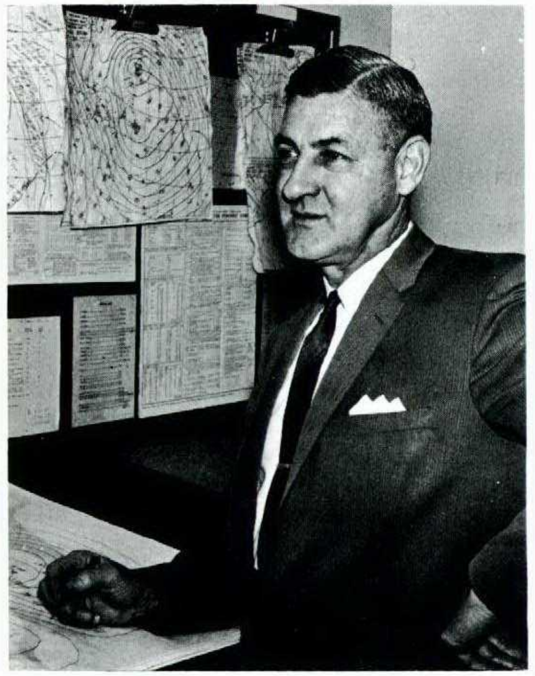
The often unorthodox behaviour of weather in areas bordering large bodies of water creates a constant menace to air operations. Probably in no other area must the met man and pilot be more alert to the weather situation.

Land and sea breezes cause unusual weather phenomena, cause rapid weather changes and can cause disaster to the unwary. Coastal Chambers of Commerce notwithstanding:

Where the warm land and cool seas meet
You'll get fog, and winds and rain and sleet.



the AUTHOR



Lamont B Foster has been Senior Met Officer at RCAF Station Greenwood since 1949. "Monty" as he is popularly known to aircrew on the East Coast has been concerned with land and sea breeze effects on maritime climate, for twenty-one years, and with the exception of four years at the DOT Regional Weather Office in Halifax, he has been forecasting at RCAF stations. He is a real "Bluenoser", born and educated in Nova Scotia. Mr. Foster is a BA graduate in Maths and Physics from Acadia University. He married a maritime girl and they have three children.

STOP THAT AIRCRAFT!

Can the warm weather bring ice-like runway conditions?—YES

Spring's here, and with it two seasonal phenomena - thoughts of love (so they say), and the WET RUNWAY. We should realize that with WET RUNWAYS (or love), stopping in time is essentially the outcome of the speed of the approach, and the down-to-earth handling of the situation! Let's deal with the latter, since contrary to common opinion, winter has no monopoly on slippery runways.

No one has come up with the real answer to solve the WET RUNWAY problem - we have special surfacing, special tires, special brakes - but we still get the same old D14s. Devices and technology cannot fill the gap between the ears of the pilot who ignores or is ignorant of his aircraft performance limitations.

Braking Coefficients. The ICAO braking coefficient chart shows that heavy rain can reduce a macadam runway to being nearly as slippery as ice. Also, while new macadam when dry, can have the same properties as concrete, the ravages of heat and use will give its surface a shiny, slippery polish. This problem prompts at least one station in the RCAF to issue a standing NOTAM stating that the runways are slippery when wet! This raises a good item for discussion: should landing instructions include the runway braking coefficient, if the coefficient drops below a predetermined number?

ICAO BRAKING COEFFICIENTS OF FRICTION

RUNWAY SURFACE	BRAKING COEFF
Dry Concrete	.75
New Macadam	.75
Slightly Wet Concrete	.75
Slightly Wet Macadam	.60
Heavy Rain on Concrete	.50
Heavy Rain on Macadam	.23
Light Snow Residue	.40
Very Cold Ice	.19
Ice at 0° C	.15
Aquaplaning	.06

Note: All values are for new tires.

Aquaplaning. Aquaplaning speeds vary with tire pressure which means each aircraft has its own aquaplaning speed. The list here, gives a few examples. The important thing to remember is that at the speed quoted in the chart

AQUAPLANING SPEEDS IN KNOTS

Chipmunk	45
Harvard	50
Expeditor	48
T33	117
CF104	133
CF101	142

Note: These figures are for average tire pressures used.

YOU ARE AQUAPLANING if there's more than .2 inch (about 3/16") of water on the runway. A heavy downpour will give you this depth of water, with the degree of drainage governing the length of time the water remains. Aquaplaning will continue below this figure once your aircraft is riding on water.

Adverse runway conditions and aquaplaning can cause the aircraft to behave as if on ice - and yet both these conditions occur at above freezing temperatures. The sledding may be poor but the skidding, sliding and skimming is pretty good this time of year.

"Profit by the mistakes of others—there is no need to make them yourself."

ARRIVALS and DEPARTURES

CF101—U/C EMERGENCY. The pilot, on signing the L14, saw a note inserted by the engineering officer, asking that three undercarriage retractions be performed after takeoff. The instructions were discussed with the NCO and the pilot walked away with the erroneous idea that he was to exercise the emergency system. The pilot states "At the moment I thought this was not right, but in the process of getting the aircraft checked out and airborne the doubts were forgotten".

After three successful retractions on normal hydraulics, the pilot performed an emergency extension. . . "At this point I realized I had done something wrong although I wasn't sure what it had been". The selection of the undercarriage emergency system with normal hydraulic pressure available resulted in the introduction of air into what is normally a fluid system. The back pressure thus created returned to the hydraulic reservoir and ruptured the tank.

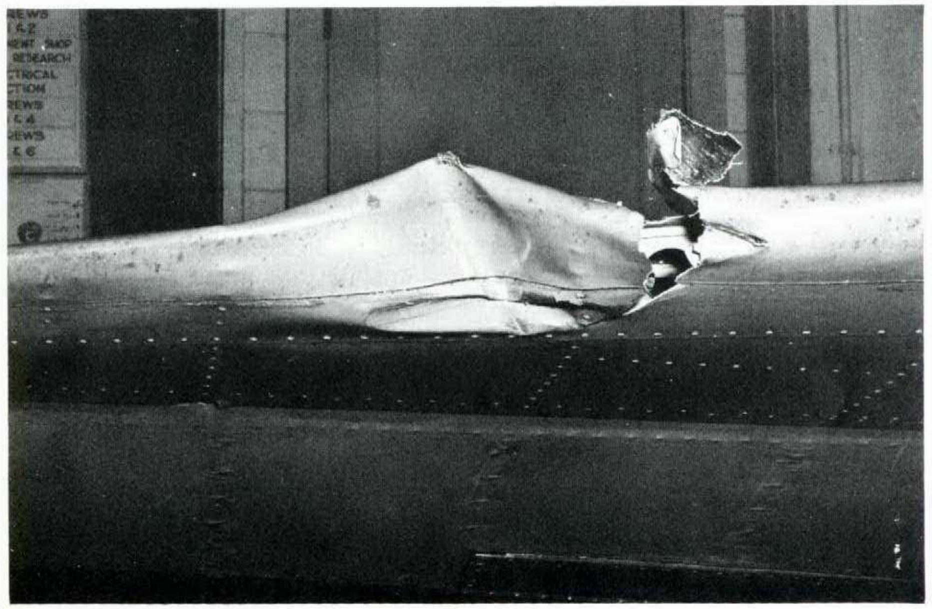
Suspecting a hydraulic pump failure the aircraft was landed as soon as possible, with 9000 lbs of fuel. With emergency braking on a slippery runway the pilot had to rely on the barrier to stop; this was successful, being engaged at 60 kts.

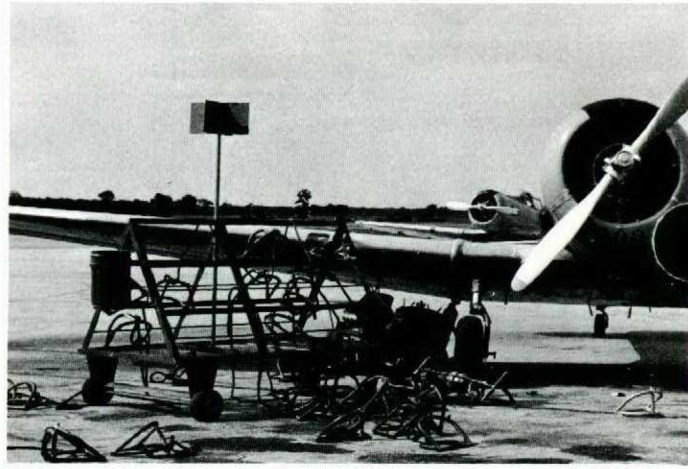
An old Chinese proverb comes to mind "He who asks question appears ignorant only for few minutes—he who never asks remains ignorant all of life".

DAKOTA — JAMMED CONTROL. During a night training exercise in a Dakota, a simulated engine failure was made by moving the mixture to Idle Cut-Off position. The student carried out the prescribed drill and the instructor attempted to return the mixture to Rich position. The mixture control jammed in the ICO position and could not be moved. The engine was feathered and a single engine landing carried out.

The linkage to the mixture control had been inaccurately positioned causing a geometric lock to occur. Maintenance personnel must be acutely aware of accuracy when adjusting linkage devices.

CHIPMUNK—RUNWAY FLAG. As so often happens in the early phases of flying training the takeoff was not down the runway. As the aircraft left the runway boundary a thump was heard and the aircraft became airborne. The leading edge of the tailplane was damaged as it struck a marker flag that had been installed near the runway to mark a manhole cover. The vertical shaft of this flag stand was solid steel! Needless to say this particular marker is being replaced by a flexible staff. But why wasn't this done in the first place? Steel stakes alongside a runway are a pretty obvious and unnecessary hazard—particularly at an airfield where students take their initial pilot training.





CHIPMUNK CHOCK-RACK AGAIN. Taxiing on the tarmac after a training flight a Chipmunk struck a chock-rack damaging the leading edge of the starboard wing. If this sounds familiar, it should; this same chock-rack claimed another victim five months before as shown in the photo. A combination of inattention by the student and obstructed vision of the instructor resulted in this mishap.

Taxiing accidents, of course, are just not excusable and so the verdict must be "Pilot Error". But perhaps there is more to it than that: since this particular rack was involved in two accidents, obviously its location must be suspect. Chock-racks, like ditches, are quite unnecessary hazards on an airfield. An alert SFO is a station commander's best defence against embarrassments like this. Surely this chock-rack will not get a chance to claim any more victims.

T33 EJECTION. "I was just levelling off at my assigned altitude, airspeed 325 kts and everything was working perfectly. Suddenly there was a tremendous decelerating force and the aircraft yawed violently. I saw a bright flash and was slammed against the side of the cockpit. The aircraft began rotating with violent "G" forces and the control column had no effect. I elected to eject. . ."

In fact, the T33 had broken completely in two just aft of the rear cockpit. Both pieces tumbled to the ground in flames leaving a trail of black smoke.

The aircraft was on a CEPE project mission to drop an instrumented "bomb" as part of the Short Range Reconnaissance Drone System trials. The "bomb" was fitted with two parachutes—one was to deploy automatically after the bomb was released from the aircraft and the other was an emergency parachute that could be deployed by a radio signal from the ground if the first failed to function.

The emergency parachute had prematurely deployed while the bomb was still attached to the aircraft causing such a tremendous yawing force that the aircraft actually broke in two.

Investigation showed that all systems were correctly connected and functioning properly. Therefore, the emergency parachute must have received a signal which caused it to deploy. As the command radio signal must be on the exact UHF carrier frequency and also be modulated simultaneously by two different modulating frequencies the chance of a spurious signal triggering the device was considered so remote that it could be discounted. The signal must have come from the ground transmitter designed for that purpose.

Somehow, the required radio signal was inadvertently transmitted. Just how it was done or the individual responsible could not be determined. However, a lack of safety precautions is clearly evident. In the first place, the "bomb" should have been designed so that it would be impossible to deploy either of the parachutes while it was still connected to the aircraft. Secondly, any switch that can immediately destroy an aircraft in flight must be treated with extreme caution! Surely it should have been at least safety wired and guarded.

Except for a few minor scrapes and bruises the ejection and subsequent parachute landing were completely successful. The pilot was picked up by helicopter only 15 minutes after landing; that he did not have his seat pack connected was of no consequence in this case. However, this raises an interesting point. The pilot purposely did not connect his seat pack because of rumours that it was possible for the seat pack to ride up over the parachute and prevent it from deploying. Many tests have been done and Safety Equipment experts assure us that it can't happen. The seat pack might be pretty handy to have along if you are forced to eject over a thinly-populated area where rescue might be a long time coming.

Safety equipment should be used as directed. If you have doubts regarding efficiency of any part of the system, or ideas picked up from flight room chatter which seem more sensible to you; go to the source for verification. Write to talk to the experts; give them your reasons for changes; discuss your doubts with them; convince them if you can, that your suggestion is valid—but—don't go it alone—for your own sake.

T33—LOST. The student and instructor were on an instrument training mission. After completing one beacon letdown and GCA and climb-out, a second beacon letdown was requested. Later the aircraft broke out of cloud in an unfamiliar area and out of radio contact with terminal control and GCA. Fuel quantity was down to an unsafe level. By the time position was finally determined and radio contact resumed there was insufficient fuel to reach base. Both ejected successfully.

The instructor had permitted the letdown to be commenced without positive knowledge of position and by using a non-standard procedure during the descent. Despite the radio compass being suspect a UHF/DF letdown was not requested. Neither had the pilot declared an emergency or actuated his SIF.

The inquiry established also that handover procedures between terminal and GCA contributed to the aircraft being permitted to fly beyond contact. Decisive action could have saved the cost of one T33.

CF104, YOU WOULDN'T BELIEVE IT. The 104 started and idled normally. As power was increased to 80 per cent to move out of the line, the pilot noticed a loss of thrust, fuel flow fluctuation and an unusual "hissing" noise. He immediately shut down. Investigation revealed extensive damage to the engine and another costly J79 had to be sent to the contractor for repair.

FOD. And this at a station that is particularly aware of the problem because of the expensive aircraft operated there. Here's how it happened. The night before, two I Techs were installing an LN3 platform when one of them dropped a socket wrench into the E compartment. To recover the socket, the gun purge panel was removed and the 18 screws were placed in the intake. After the socket was recovered, each airman assumed the other had replaced the panel and both forgot to make an L14 entry.

The next morning a BFI was completed and even the panel which was hanging by its chain, was not noticed. A little later sand was reported in the intake of another aircraft and a special FOD check was done on all aircraft and still the screws were missed! Finally, as the aircraft was being towed out to the line, the panel hanging by its chain was noticed. The L14 was checked and no entry could be found concerning this particular panel. As the screws were not in a plastic bag taped to the panel as is standard practice, a search of the immediate area was made and the screws in the intake again were not noticed. After discussing the matter with all concerned, and receiving assurance that a thorough search had been made, the NCO i/c Snags ordered the panel replaced using new screws. Finally, the pilot on his external also missed the screws and the last chance to prevent this costly incident was lost.

It is almost unbelievable how so many people could miss seeing the screws in spite of the heads being coloured red, white and blue. Screws were experimentally placed in the intake to see if they would roll out of sight—they did not. The aircraft was towed; still the screws didn't move. There is no other conclusion: the original screws were in plain sight all the time but nobody saw them!

This is a good example of how easy FOD damage can occur. In spite of the concentrated campaign throughout the Air Force, FOD is still costing us millions of dollars each year. It is evident that even greater vigilance is required.

LETTERS TO THE EDITOR

Dear Editor:

As requested, here are some comments on your resume of the "Harvard Ground Loop" reported in the Sep - Oct Flight Comment.

Your assessment of the cause of this accident is undoubtedly wrong. Inexperience may have been a contributing factor - but nothing more. This accident was caused by poor instruction and I suspect that by now the Standards Squadron has shown a certain QFI the error of his ways.

For as long as I can recall both the Instructors' and the Students' Handbooks have taught that corrective action for a swing on landing is: Rudder - Brake - Power. In that order and with no exceptions. They also recommend that the control column be held fully rearward after landing to obtain maximum tail-wheel traction.

From the resume you give it appears that not only did this student use incomplete corrective action for the swing, but he also had the control column approximately neutral as on the overshoot "he applied backward pressure on the control column". Since the tail-wheel was probably "skipping" it is not surprising that the use of rudder did not prevent a ground loop in this case.

To raise again the question of the procedure to adopt in the event of a developing ground loop is like asking one to re-evaluate the merits of aircraft over airships. The recommended procedure is tried and proven and is not really open to debate unless we wish to go back to the era of non-standardization. You suggest that "possibly a little application of right brake in the early stages of the swing" might have saved the day. True, but can you visualize the prancing pirouettes of the Harvards if directional control on the runways were left solely to the student's uneducated feet upon the brake pedals - each pair of which are different in feel from the next. The steerable tail-wheel was fitted to the Harvard to help prevent ground loops - for Heaven's sake let us use it.

It has been said that there are two kinds of Harvard instructors: those who have ground looped, and those who are going to. Therein lies a weakness in our accident prevention program; the belief that a ground loop one day is inevitable. I disagree unequivocally with these sentiments. Those who have ground looped will agree that if they had been sufficiently on the ball it would never have happened (or they must concede that the aircraft is more than they can handle). If one is always ready for that swing then it will never reach unmanageable proportions; assuming of course that one is not flying in impossible wind conditions.

In summary, and for your interest, I would like to submit my formula for a ground loop free instructional tour:

- do not accept an aircraft with "doubtful" brakes;
- do not land when wind is beyond safe parameters (divert - change runways, etc);
- be prepared for a swing on every landing;
- once down keep the tail firmly on the ground for maximum traction;
- in the event of a swing, do not innovate; use the time proven and accepted procedure: Rudder - Brake - Throttle and overshoot.

If you need power to recover then your reactions were too slow. If you do not recover then you were day-dreaming.

JB Peart F/L
Ex Harvard QFI, TCHQ

Editor's Comment:

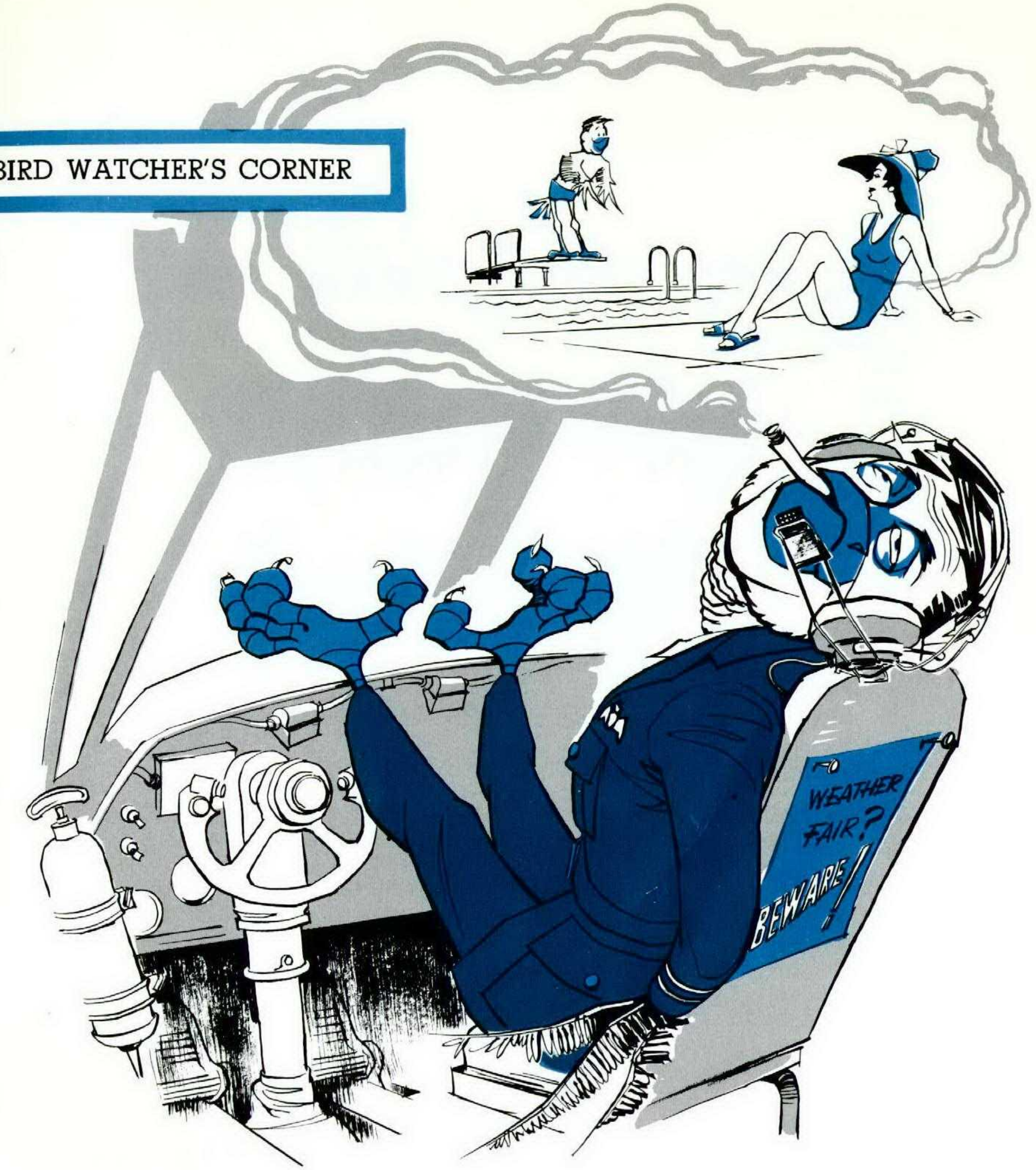
This is the first chance we have had to publish F/L Peart's well-written letter. In the meantime there have been twelve Harvard ground loops which caused substantial damage. Obviously the problem is still with us - Ed.

Dear Sir:

I noted on page 20 of your Mar-Apr issue that you credit Air Materiel Command for having engineered the modification to the T33 external canopy jettison handle so that the slipstream cannot pull it in flight. In actual fact the engineering was done by CEPE at AMC's request.

S/L AE Sutherland
CEPE, RCAF Stn Uplands

BIRD WATCHER'S CORNER



THE CLOUDY-HEADED CAREFREE CUCKOO

Warm weather, sunshine and gentle breezes bring from hibernation the Carefree Cuckoo. Unlike other birds at our airports this species is characterized by a seasonal metamorphosis, rendering his year-round common-sensical appearance noticeably changed. Dewy-eyed and smiling absently this bird can be best observed idly perched at the controls. Thus preoccupied, it becomes easy prey to flying hazards that inattention invariably creates.

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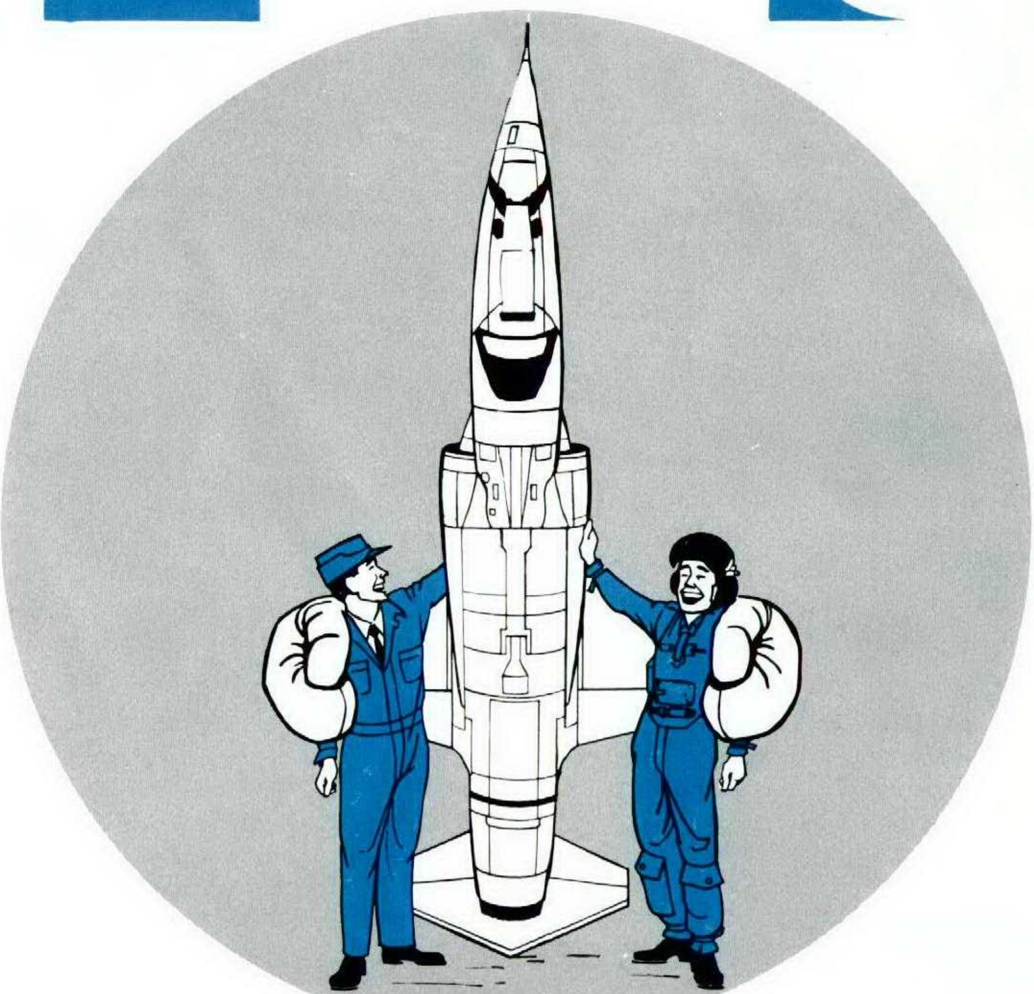

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