FLIGHT COMMENT

JANUARY · FEBRUARY · 1965

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Editor—S/L WA Smith

Feature Editor—Miss AV McIntosh

Associate Editor—F/L JT Richards

Artists—JA Dubord
HK Hames

Editorial Assistant—Miss R Mayhew

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, CFHQ/DFS, Ottawa 4, Ontario. Annual subscription rate is $1.50 for Canada and USA. Subscriptions available at Queen's Printer, Hull, P.Q.

G/C AB SEARLE
DIRECTOR OF FLIGHT SAFETY

W/C D WARREN
FLIGHT SAFETY

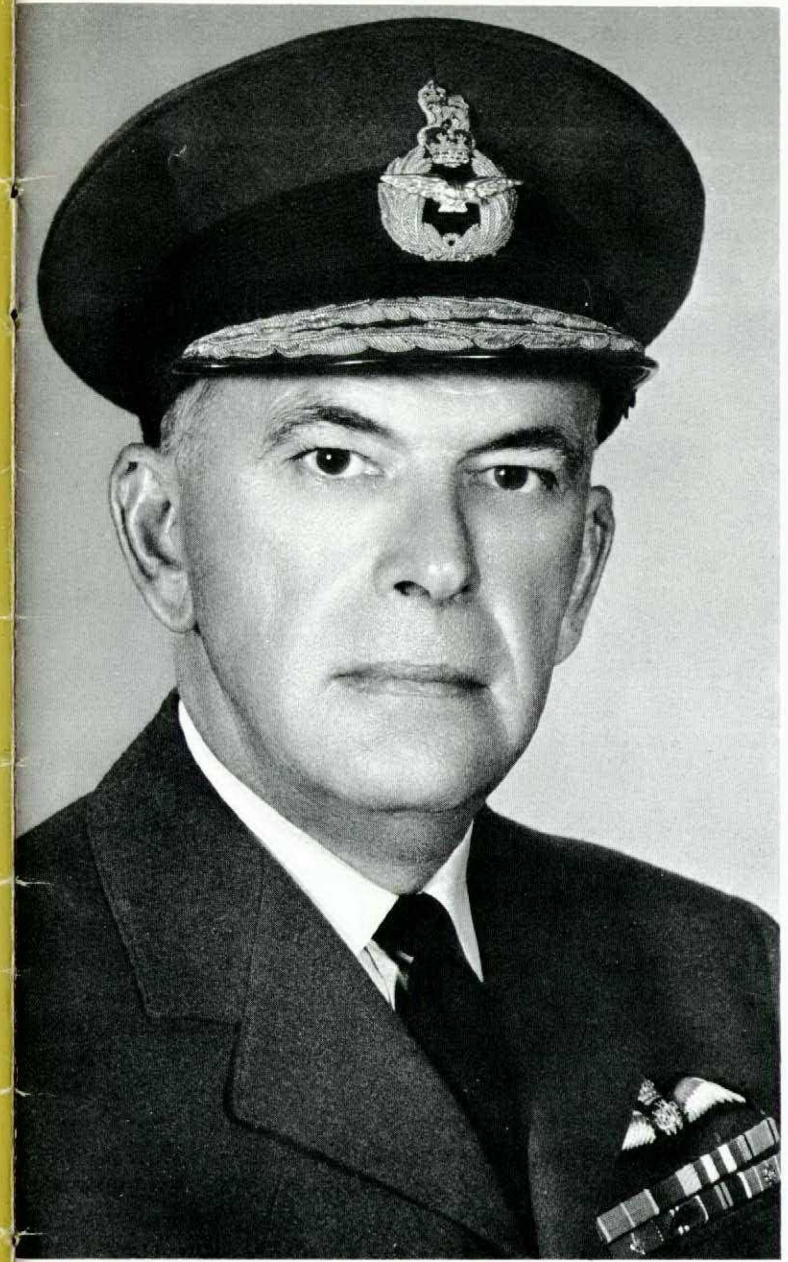
W/C JT MULLEN
ACCIDENT INVESTIGATION

Articles

Features

CANADIAN FORCES HEADQUARTERS
DIRECTORATE OF FLIGHT SAFETY

ROGER DUHAMEL, F.R.S.C., Queen's Printer and Controller of Stationery, Ottawa, 1965



Air Chief Marshal FR Miller
Chief of Defence Staff

As we enter the first New Year of the existence of the Integrated Defence Staff, I welcome this opportunity to direct a few words to commanders, aircrew, controllers, technicians, and all others who are concerned with safety in flight. The New Year is the traditional time to take stock of the past, study its message and apply the lessons learned to the future.

Statistics for 1964 are not yet complete but those obtained to date indicate a further improvement in our aircraft accident rate. I am aware of the great effort which has made this possible. We can be proud, but we must not be complacent. The complexity and cost of present-day aircraft and the problems of providing replacements make it all the more essential that we do not lose them in accidents which more care would have prevented. The need for conservation of our resources has never been greater.

I recognize and accept the responsibility of this headquarters to provide the aircraft which will fulfill our defence roles. It is in turn your responsibility to operate, to control and to maintain these aircraft with precision and with safety. We have reached the stage in flight safety when most hazards can be foreseen and prevented. If we are to drive down our accident rates even further, and rising costs dictate that we must, then a searching examination is required to detect hazards that we have previously not recognized.

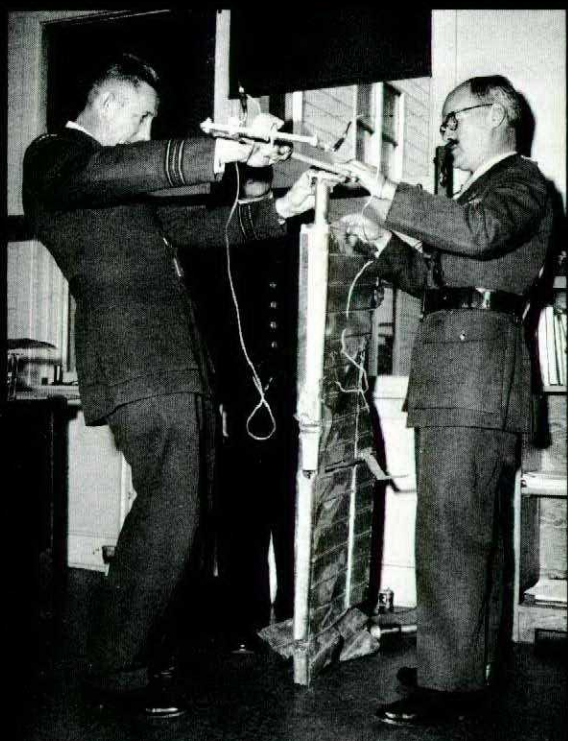
With integration we have combined Navy, Army and Air Force staffs who can pool their knowledge in producing the more effective safety program we seek. We can and must learn from one another. Problems may now be solved as a result of our combined experience and this exchange of information and knowledge will benefit all who may be involved in the various flying activities of the armed forces.

I congratulate you on your achievements. I wish you success and urge you to greater efforts in the future to the end that progress will continue in this important field of flight safety.

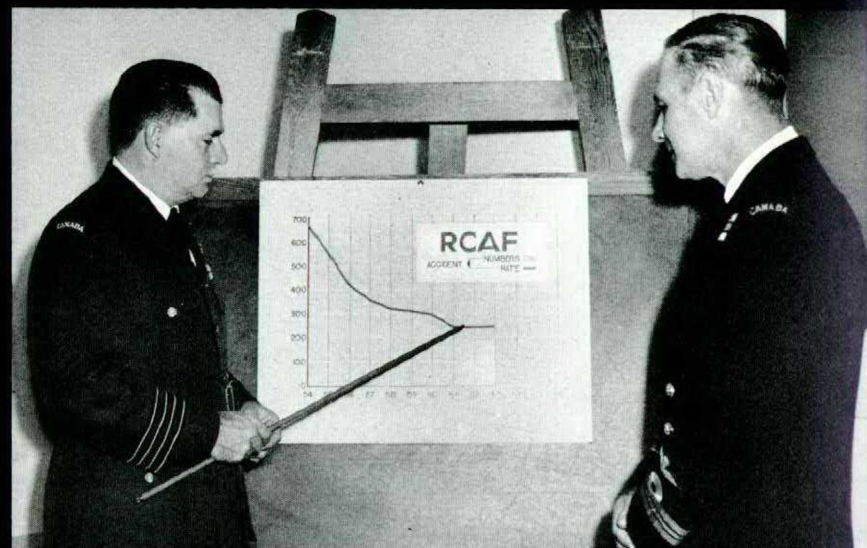
FR Miller

DFS Integration

New faces and broader responsibilities—that's the story in a nutshell . . . on this page, we present some of the people you'd meet in the directorate offices, on the job, sleuthing, reviewing, advising, creating, and doing the inevitable plain old paperwork. They're not all here, but we thought it a good chance—while we're on the subject—to show you around the shop in pictures . . .

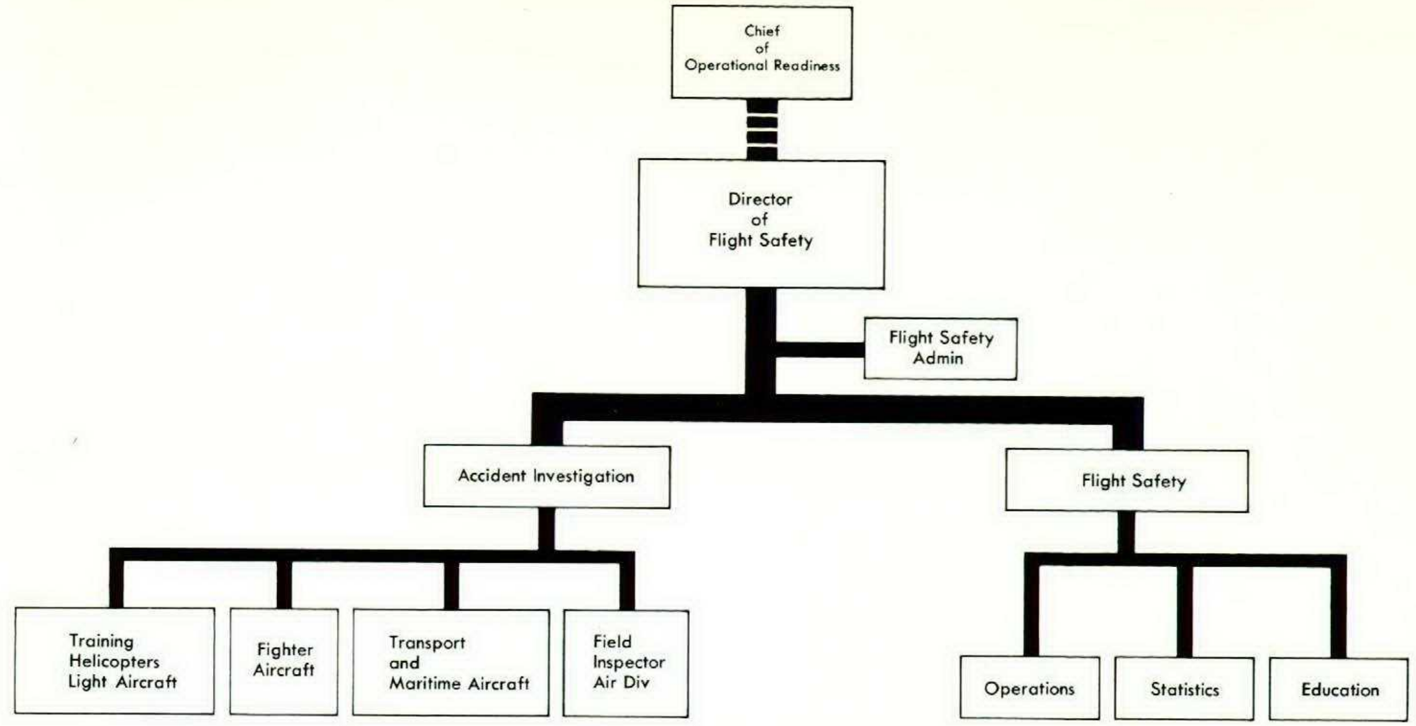


It's only junk, but very valuable—a control surface and linkage mechanism is examined by S/L JE Ledbetter and Major GM Henderson.



G/C AB Searle, Director of Flight Safety points out the accident rate progress in the RCAF to L/CDR JM Riley.

That broken piece of undercarriage can tell a lot if carefully examined. Here, S/L MD Broadfoot, S/L TM Webster and L/CDR Riley discuss the possible cause of its failure.



S/L GC Letcher CF104 accident investigation specialist.

A small clue; perhaps only a scratch, but it's enough of a lead to produce a "fix". S/L GW Ovans points out the telltale mark to Major GM Henderson and L/CDR JGS Campbell.

How to tell the flight safety story? The Flight Comment staff discuss contents and techniques at a staff pow-wow. Left to right: Miss AV McIntosh, Feature Editor; F/L JT Richards, Associate Editor; S/L WA Smith, Editor; HK Hames, Artist; and JA Dubord, Artist.

S/L TM Webster fighter "cell" accident investigator.

DFS Integration

The prevention of aircraft accidents is common to all organizations which operate aircraft; it is for this reason that the Flight Safety field lends itself to integration. Consequently, the Directorate of Flight Safety has been one of the first to integrate at the new Canadian Forces Headquarters. The Directorate is little changed in its structure except that officers of the navy and army now serve on the staff.

DFS now is responsible to the Chief of Operational Readiness, Lieutenant General JV Allard.

The directorate is divided into two branches: accident investigation and accident prevention. The investigation side is composed of either pilots or aeronautical engineers who have had specialized training in aircraft accident investigation (mostly at the University of Southern California). In addition, the pilots must be qualified on the type of aircraft for which they are responsible. Together, the pilots of the directorate represent more than 100,000 hours of flying experience.

AIB branch is subdivided into "cells" ie, a group of specialists are assigned to a general type of aircraft. These types fall into three somewhat homogeneous groups: helicopter, training and light aircraft; fighter aircraft; and transport and maritime aircraft. The cell is responsible for all flight safety aspects of its assigned aircraft. In addition, because of the distance involved, one inspector is permanently located at Air Div Headquarters. All reported accidents or incidents receive a final review and are assessed according to the cause and contributory factors. The appropriate investigator goes to the scene of most major crashes and conducts his own investigation; units may request an investigator's assistance on other mishaps. It is extremely important that the cause of the crash be determined; if the cause remains unknown, there is obviously little that can be done to prevent another similar accident from happening. An investigator will spare no effort to track down all the "cause factors". The scientific sleuthing done in the RCAF Materiel Laboratory at Rockcliffe frequently uncovers minute clues as to how and why a particular component failed.

The other side of DFS, the Flight Safety section is divided into operations, education, and statistics. The operations section tackles aspects of flight safety that encompass aircraft operation generally, eg, runway lighting and barriers. The education section comprises the "Flight Comment" staff who in addition to publishing the magazine, produce posters and other flight safety literature. The navy and army officers on the accident investigation side of DFS will be contributing flight safety material that is appropriate to their service. At the same time Flight Comment welcomes contributions and comments from individuals on the flying units, particularly the navy and army which have so recently joined forces with us in trying to reduce aircraft accidents.

The statistics section houses all records of accidents and incidents, (and also individual pilot accident records!). A card system enables information and significant trends, etc, to be readily available for directorate use and research.

Now that DFS includes officers from the army and navy as well as the air force, the flight safety effort will benefit from the widest possible experience in Canadian military aviation. This pooling of experience and knowledge in the diverse flying operations of the armed forces cannot help but be of benefit to all of us who fly the aircraft, fix them, or work at headquarters trying to keep them flying as safely as possible.

Tracker directed to deck park after landing on board HMCS Bonaventure.

HO4S-3 helicopter using the "dunking sonar" technique for locating submarines.

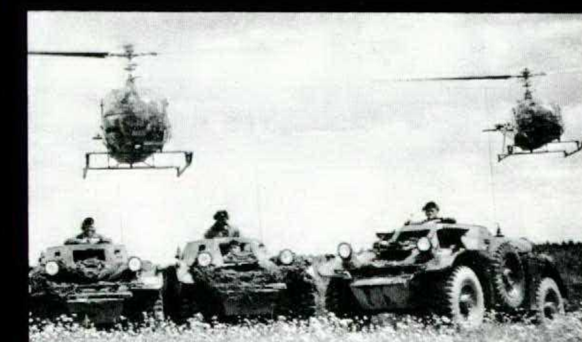
The CHSS-2 Sea King now joining the fleet.

CS2F Trackers deploy for catapult launch from HMCS Bonaventure.

Canadian tanks and infantry advance against British and US Army positions during an exercise in Germany. Seen overhead is one of the helicopters used by the empire and control staff.

The Cessna L19A used as a liaison and spotter aircraft.

A formation of Army CH112 Bell helicopters.



Ferrets and helicopters on an exercise at Camp Gagetown.

RATCON

PATTERNS IN AIR TRAFFIC CONTROL

S/L JE Greatrix

Most major airfields are equipped with terminal radars. They can be a great help in speeding the flow of traffic, ensuring safe separation, and generally lessening the load on aircrew. Most pilots have had the experience of being vectored around by terminal radar—just when you needed that practice ADF!—but the capabilities of the equipment and controllers are not widely known. For example, many of us might not request an enroute descent if the RT indicates that the controller is busy, thinking that conforming to the published letdown would save him the bother of providing you with vectors. (In this case, however, the opposite may be true.)

You'll be seeing more of RATCON in the future—to clear up some of these fuzzy areas, the experts give us the following gen.

The maximum radius range of an RCAF RATCON is 120 nautical miles; this is subject to interference from surrounding terrain, weather and other geophysical phenomena. The airdrome surveillance radar used by the DOT can see slightly farther, generally out to a range of 150 miles. For both equipment, effective control of aircraft is possible up to 35,000 feet. The useful range of both equipment is extended out to approximately 200 NM if SIF/IFF is employed.

Terminal radars enhance the air traffic control function by allowing the controller to:

- maintain surveillance of enroute and terminal air traffic thus providing him with supplementary and more complete information;
- provide radar navigation to, or between, established fixes to give radar separation as required;
- vector inbound aircraft to provide separation and radar navigation from established fixes in the terminal area to all runways from which aircraft can be brought in by ILS, GCA, or a visual approach;
- monitor IF approaches and local storm or precipitation areas; and
- expedite departures under IFR by means of radar vectors allowing reduced separation standards.

This will result in a speed-up in the flow or air traffic with an increased degree of safety.

For the pilot, the operating procedures have become quite easy. Rather than having to think out the letdown procedures, altitudes, headings, entering and maintaining holding patterns, he is required only to fly the approach according to instructions given and need only concern himself generally with the actual flying of the aircraft.

Enroute Descent

One aspect of the radar controlled approach that sometimes confuses the pilot is enroute descent. As is well known, when flight planning, the TAS to be flown is written in the F48 or DOT form. The controllers expect that the pilot will adhere to this TAS so that when a normal enroute descent is approved, for example from 60 miles out, the adherence to the airspeed factor is important from the viewpoint of traffic separation. The pilot should descend maintaining as close as possible his enroute TAS or Mach number until he reaches an altitude where it becomes advisable to continue descent (in clean configuration) at the aircraft's normal letdown IAS. An attempt to maintain enroute Mach down to low level could result in an unreasonable rate of descent and dive angle. The point at which speed is reduced to approach speed depends on the type of approach, the runway in use, and the instructions issued by the controller. On this

Radar Approach Control at Ottawa International Airport

latter point, radar controllers generally give the pilot a continual picture of their intentions, the pertinent traffic, and the aircraft's position relative to the aerodrome.

In the cruise descent, how far out does the pilot begin letting down? The pilot does not want to reach minimum altitude too soon, thus requiring a high expenditure of fuel due to motoring along to destination at low level or to overshoot a "gate" position at too high an altitude or airspeed. In the T33 for example, you are flying at 35,000 feet cruising at Mach .7, and then begin a cruise descent using about 80% (let it fall off with altitude), at Mach .7 until you reach the altitude where 300 kts IAS equals Mach .7. You then continue descending using 300 kts IAS as your airspeed for the remainder of the letdown. Under still wind conditions, the approximate distance you would travel from 35,000 down to about 1,000 feet would be close to 80 nautical miles. Therefore, as a guide, the range at which you should commence a cruise descent in a T33 can be reckoned roughly by this formula:

double your altitude +10

Example: T33 at 35,000′

$35 \times 2 + 10 = 80$ *nm*

Example: T33 at 20,000′

$20 \times 2 + 10 = 50$ *nm*

These formulas employ the +10 factor for subsonic aircraft (eg, T33); use +15 for the CF101 and CF104. A good stiff jet stream up your tailpipe or on your nose can make a liar out of this formula, but as a rough guide it will do. There are times on a radar controlled enroute approach when the controller tells you to expedite your descent; when given this instruction, there is no need to auger in supersonically, but only to use the speed brakes, power setting and airspeed used for a normal IF descent in that particular aircraft.

You may be cleared "from present position to commence high-speed descent" which means the normal letdown speed and power settings for an IF descent. The distance formula for these conditions is:

altitude +10

Example: T33 at 25,000′
25+10=35 nm

The fuel savings of the enroute descent or the straight-in "high-speed" descent amount to your landing with about the same fuel quantity as being overhead the facility at high altitude.

There is doubt among pilots on the procedures to follow if two-way communication failure should occur in a RATCON or RAPCON approach. First, as in all other phases of enroute IFR clearances, you should always be given a clearance limit both for an altitude and fix position, eg, "you are now cleared to the airport for a radar-vectored approach and GCA onto runway 25, continue descent to 3,000 feet, report at 3,000 feet". If, shortly after this transmission, you level off and repeatedly report to Approach Control at 3,000 feet and receive no answer, you can assume that your radios have gone in the transmitter or receiver modes, or in both functions. To further complicate matters assume GCA is not transmitting on beacon frequency with emergency instructions. The pilot in this case is then committed to press on to the most suitable approach facility for that aerodrome at the last assigned altitude, transmitting blind, and carrying out the published ADF, TACAN, VOR/ILS approach or a necessarily modified form of that approach, eg, proceeding outbound from a beacon at 3,000 feet ASL rather than at the published altitude of 20,000 feet. The approach controller, noting that you are no longer following and acknowledging his instructions will ensure that other traffic is cleared out of your way.

The Random TACAN Approach Concept

The random TACAN letdown gives air traffic control a more flexible and expeditious means of recovering aircraft than by the present standard published approaches. It is somewhat similar to the direct radar-controlled approach in that the aircraft can safely commence an enroute descent directly to the gate or to the facility itself, the pilot monitoring his distance and position. Employing a new letdown plate, the pilot can read the minimum altitudes for each arc, eg, the 15 mile arc at 4,000 feet. The five types of letdown open to the pilot are:

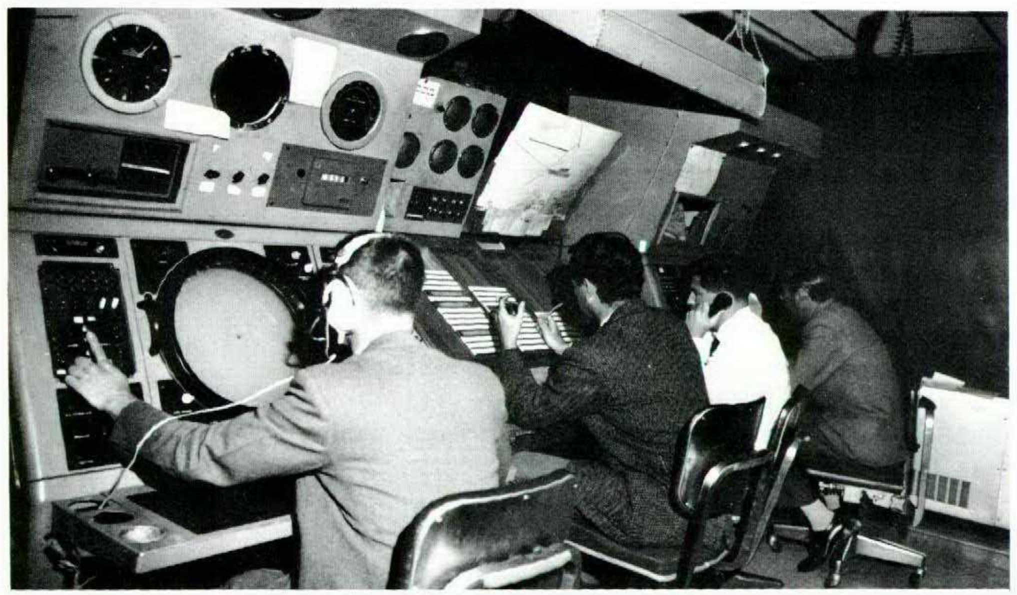
- Straight-in Approach. In this letdown, the pilot holds and descends on the straight-in radial serving the landing runway.
- Random Approach. The pilot proceeds from his location directly to the gate, cutting arcs and radials in his descent. An overhead procedure may be required at the gate if the gate is approached from a large angle.
- Direct Approach. The pilot descends directly to the aerodrome on his present radial. This letdown is a cloud-breaking procedure or runway circling approach when circling limits prevail.
- Arc Approach. In current use, this letdown has the pilot descend directly towards the station until intercepting a prescribed arc. He then flies the arc to intercept his inbound radial.
- Teardrop. This is much like the ADF approach. The pilot proceeds at initial approach altitude to the TACAN, then on station passage, commences descent on a radial 20° right or left of the reciprocal of the inbound track. A standard penetration turn to intercept the inbound radial is commenced generally on a prescribed arc, ie, distance. The pilot proceeds inbound on the approach radial down to published minima.

The advantage in having the choice of TACAN letdowns is of course, the expediting of traffic flow to the landing runway, saving time, fuel, and aircraft holding.

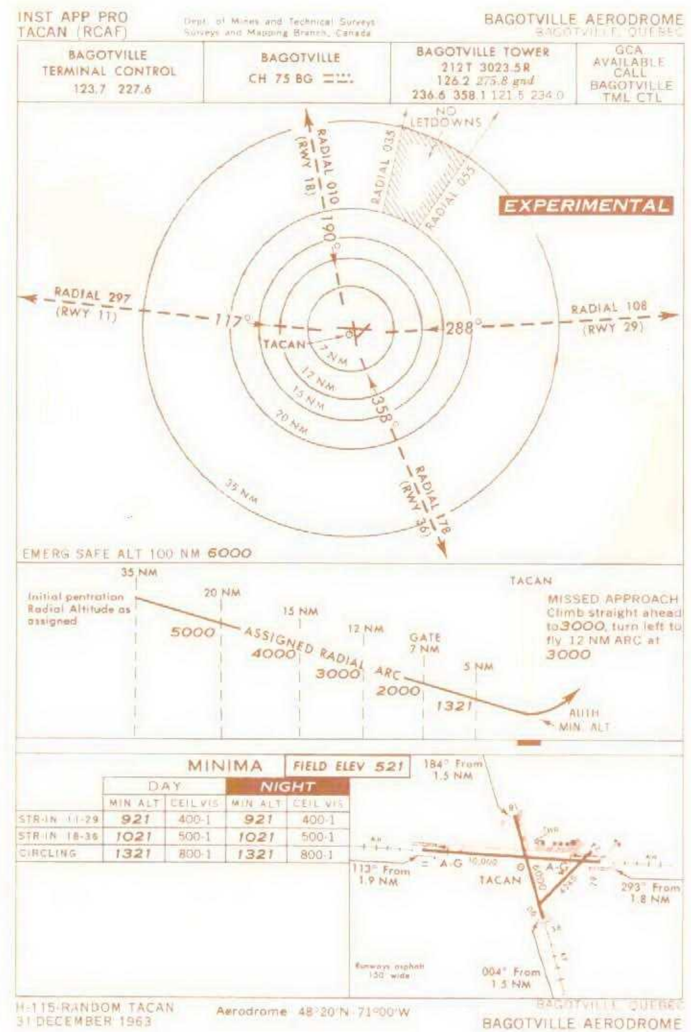
Only one letdown plate would be needed for each aerodrome in place of the two or more charts presently carried in the GPH 201 and 200. ADC has been experimenting with these procedures at Stn Bagotville and they have been well received by both pilots and controllers. To ensure safe separation, the various types of aircraft must use standard descent speeds for each type eg, Voodoo 300 kts, T33 280 kts. Also, variations from these speeds can radically disturb the smooth flow of air traffic.

Serviceable TACAN equipment and close radar monitoring are definite requirements in periods of high-density random traffic. Without both, there is the possibility of traffic flow degenerating in a short time into something less than a safe separation. Firm communications failure procedures have not yet been resolved but are undergoing study.

ADC has extended this experiment to other ADC bases and the progress of the project will be watched with interest.



The Department of Transport, Terminal Control Unit at Uplands seen here employing the radar screen and data board to control traffic arrivals and departures. Left to right: arrival controller, terminal controller, data controller, departure controller.



Photostat of the Experimental Random TACAN letdown plate used to initiate the trials. Holding points, gates, and obstructions are not depicted on this plate.

TWO YEARS ACCIDENT FREE

Flight Comment salutes the Flying Instructors School detachment which operates T33s out of Stn Portage la Prairie. On 12 Oct 64 they completed two years and 11,600 flying hours without an accident. This is indeed commendable having been accomplished in an instructional role compounded by the problems (eg, fuel) that have plagued the T33 during this period. They have operated removed from their parent FIS at Moose Jaw but nonetheless have taken an active part in Portage's Flight Safety Program, originating several useful safety ideas.

Winter Tips

Here are some suggestions for keeping out of winter trouble now that the season is really upon us.

- If the weather is marginal, ask yourself: "Is this trip really necessary?" If there is reasonable doubt—delay the flight until conditions improve.
- Make a thorough check of all enroute weather conditions. Knowing the weather at both ends of your flight is small consolation if an emergency forces you to hunt for a home somewhere enroute.
- Have an alternate plan of action in case everything turns to worms.
- Review the letdown plate for your alternate and your destination while you have both feet on the ground and plenty of time. Study the missed approach, minimum altitude, and layout of the surrounding terrain.
- Avoid flying thru freezing rain . . . it can make thunderstorms seem agreeable by comparison.
- If the runway isn't in sight when you reach minimums, proceed to your alternate . . . don't cheat on the system, you pay with your neck if you get caught!

TAC ATTACK

Listen my children and you shall hear-- the sad, sad story of... one for the gear

As it must to all men. Old Ankledeep Jones who had been with the squadron for many moons received orders to depart for Boondocks AFB in the Far, Far East. This move came rather sudden so it was agreed to have a small cocktail party at the Sqn CO's place Wednesday night. Now one of Jonesey's best friends was our hero Lt Happin Stance, so it was inevitable that he should attend.

Let's look at Happin's actions on Wednesday.

1600—Goofed off a little early, went home and tinkered with his Stutz Bearcat.

1700—Shines, showers, shaves, shampoos and gets dressed for the party.

1800—Lt Stance and wife arrive at the old man's place, bid hellos and has a martini (two olives).

1815—No drink before leaving home, so first martini (with two olives) is gulped down—Hap has another.

1840—Makes points with the CO's wife by telling a humorous, ever so slightly risqué story. Gets her and himself another martini (with two olives).

1900—Hap misplaces his glass; was sure it was barely touched—CO insists he take a fresh martini.

1920—Wife reminds him that he has alert in the morning —Hap replies that it's early, and they will have a big dinner; has another (with two olives).

1945—Dinner delayed—another round of drinks.

2000—Dinner served—very filling.

2130—Brandy and coffee.

2150—Remembering alert the next morn, declines second brandy.

2215—Conversation gives way to shop talk. Thirst from slightly salty ham slaked with highball.

2240—Hap relates tales of Pterodactyl and hardly notices that his highball has been refueled.

2300—Decides it's departure time so on the insistence of his dear friend Ankledeep, has one for the road.

2315—Our hero and wife depart.

2330—In bed and asleep in ten minutes.

0700—Up and feeling fine after 7½ hours of sleep.

0730—Slight headache dispelled by coffee, two eggs and toast.

0800—Sets up aircraft on alert and takes over five minute status.

0815—SCRAMBLE.

0818½—Engine runs rough while passing thru 7,000 feet.

0826—Aborts climb and heads for the air patch.

0832—Lands on active runway, however, Lt Happin Stance forgot to lower the landing gear.

0832—MAJOR ACCIDENT.

The aircraft accident investigation board came up with the primary cause of the accident—pilot error and contributing cause materiel failure (rough engine). They asked our hero (?) how he had spent the evening before the accident and he pointed out that he had only a couple of martinis, a brandy and two highballs, ate a good meal and 7½ hours of sleep. With this explanation the board assumed he was in good physical condition at the time of the flight. In actuality Lt Happin Stance had six martinis, three scotches and a brandy. We will naturally assume that the CO wasn't stingy with his liquor so old Hap had consumed the equivalent of seven ounces of pure ethyl alcohol. The chart (figure 1) shows that he still had at least an ounce of pure ethyl alcohol at the time of scramble. This is about the same amount as if he had taken two stiff shots of 100 proof whiskey before takeoff—not enough to make him drunk or even feel high, but enough to dull his brain and reflexes.

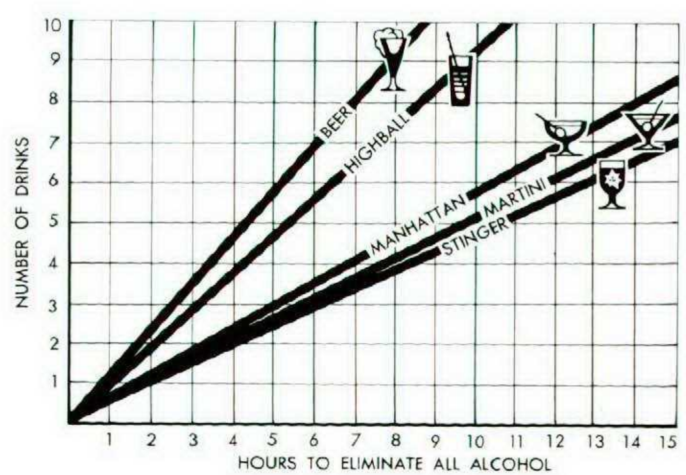
And so ends our tale of "One for The Gear".

Alcohol for all its felicitous capacity to enhance cordiality and temporarily disengage the drinker from intolerable reality is insidious. Alcohol impairs the relationship of man both with his environment and with himself. It has properties "intermediate between the addiction-producing and habit forming drugs".

It is generally conceded that virtually any discernible amount of alcohol in the blood will be accompanied by a decrease in competence—and it is at this point that alcohol is dangerous. The real, glazed-eye drunk is usually not dangerous, because he is so easily and quickly detected, or is incapacitated. The dangerous man is one who still thinks he is in possession of his full faculties, but whose judgement has been impaired.

What most people fail to understand is that regardless of how much food you eat, how much coffee you drink, how much exercise you take, or how much sleep you get, alcohol is eliminated at the same constant slow rate.

PACAF Flyer



GOOD SHOW

S/L CE KEATING

The T33 had just become airborne following a touch-and-go landing when a loud explosion was heard in the rear section. This explosion was followed immediately by engine vibration and S/L Keating elected to land straight ahead on the runway remaining. Harsh braking was necessary; however, the aircraft was safely and successfully able to turn off the runway with no further damage.

The engine was damaged by ingesting a fractured rotating inlet guide vane. This vane had failed in the first place due to its being a victim of FOD.

The good judgement and immediate response of S/L Keating in recognizing the hazard of a damaged engine led to the averting of a serious mishap. A "Good Show" to S/L Keating for a professional job in a tight situation.

F/L CR DOBBIN

F/L CR Dobbin, of Stn Trenton, was on a routine training trip in a C119. Climbing through 6500 ft after takeoff the rpm on the port engine became erratic. Hydraulic fluid was seen about the engine; an attempt was made to feather the propeller, an emergency was declared and the pilot turned toward base. The aircraft was at near max all-up weight and fuel was immediately jettisoned from the long-range tank.

The propeller however would not feather. A second feathering attempt resulted in overspeed; airspeed was reduced to the specified 115 kts to counteract this condition. At this speed the aircraft was unmanageable, however any increase in airspeed resulted in overspeeding the prop. The port engine was restarted to provide some power since at the low airspeed full asymmetric power could not be applied. Again the port engine went into an overspeed condition. However, sufficient throttle was maintained during this emergency for the aircraft to return to a suitable airport. The aircraft was landed safely. The port propeller regulator filler plug had not been tightened or lockwired—an act of carelessness that could have been disastrous.

F/L Dobbin countered this emergency with good judgement. The heavy fuel load coupled with an unmanageable engine challenged his skill to the utmost. F/L Dobbin's skill in handling the crippled aircraft certainly merits him a "Good Show".

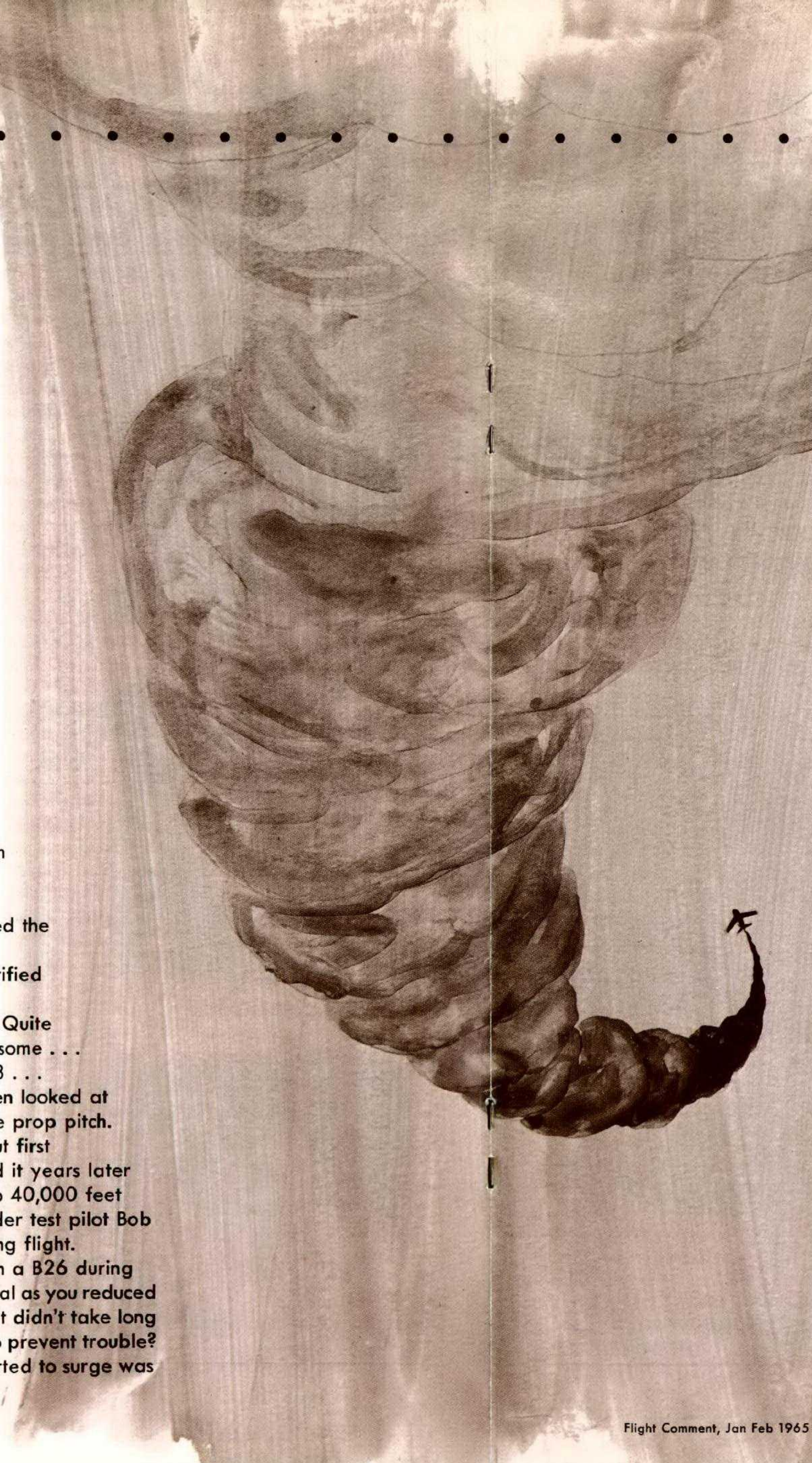
LAC JR MOORHEAD

LAC JR Moorhead of Station Uplands was doing a primary inspection on a C119 when he noticed an oil stain on the head of #8 cylinder starboard engine. Realizing this was abnormal he investigated further and found a minute crack between the spark plug insert and the valve. The cylinder was removed. With the piston out another crack running in the opposite direction from the same spark plug insert was discovered; this had not been visible externally since it was hidden by the cooling fins.

LAC Moorhead is to be commended for the diligent examination he made until he determined the origin of the oil stain. By his acute awareness of this minimal indication it is probable that he prevented an engine failure on an aircraft that had been designated for a paradrop the following morning.

The professional attitude of this airman to his duties is worthy of a "Good Show" in Flight Comment.

Time . . . . to Think



Remember all the blarney you used to hear about pilots having to be some sort of super creature with extremely quick reflexes? At times it made you wonder what poor, pathetically normal you, were doing in the program.

As the years rolled by, and your hours in the air accumulated, you discovered that quick reflexes quite often led to quick trouble . . . that damn few things happened in an aircraft that required a fast response.

Then along came the jet age and another couple of layers of goo about jet pilots having to be superhuman. This time you paid less attention to the racket and were pleased to find that the jet was just another aircraft—and if anything, less demanding in almost all areas. Fewer knobs and handles and better fuel systems more than compensated for its slow accelerating engines, limited endurance and higher cruise speeds.

Yes, the jet age has confirmed your belief that a pilot does not need—or particularly want, fast reflexes in order to survive. Now, more than ever, you can see that proper planning will avoid most trouble . . . and that you need to verify warnings before taking action.

Back in the old days your first indication of trouble was usually a needle flickering on a gauge. If you failed to notice, or if no gauge was around to warn of the malfunction, the engine would be your next clue. It'd start to run rough, belch huge quantities of smoke, oil or coolant or cut out entirely.

After recovering from the initial surprise, you headed for the nearest field at reduced power, switched tanks, manually opened the coolant doors, feathered the fool thing or took whatever other action was most appropriate to cure the visual symptoms, as verified by various temperature and pressure gauges.

The important thing was to be deliberate and not get in a rush. Quite often you found that you'd induced the activity all by your lonesome . . . like the time the engine quit as you went to high pitch on a BT13 . . . that was easy to correct, you just pushed the knob back and then looked at it to make sure you were playing with the mixture instead of the prop pitch.

This is when you learned not to move things in the cockpit without first looking to see what you had your meat-hook on. You re-learned it years later when your T-bird cockpit altitude suddenly went from 24,000 to 40,000 feet as you attempted to give the bird a shot of alcohol. Small wonder test pilot Bob White considers this one of the more important precautions during flight.

Then there was the time you had both engines buck and snort on a B26 during takeoff. Too late to abort, you looked at the power control pedestal as you reduced power slightly. Props were full forward, mixtures were not, and it didn't take long to get 'em there. Remember what you said about pre-planning to prevent trouble? Running a fuel tank dry and changing tanks after the enging started to surge was SOP in the old days . . . until you started carrying passengers. Then you got in the habit of watching the fuel pressure when the gauge said the tank was nearly dry and were able to switch tanks without shaking everyone up . . . and still completely empty the tank.

Things run much the same today . . . except a warning light quite often comes on before trouble really develops. You are not content to trust the light . . . you've learned that few troubles, including an inflight fire, are going to develop so fast that you can't confirm, and decide before taking action.

Like the time the engine blew up on your F86 . . . it took a few seconds just to get over the surprise, another second or so to confirm that the RPM was indeed zero and that the EGT was pegged before you stopcocked. Yet, the wreckage indicated little or no overheat damage . . . just a compressor that was completely torn up. You had plenty of time to decide that it wouldn't be safe to try for a flameout landing due to the control system and limited battery life, and you had plenty of time to set up for an ejection that went off reasonably well.

Plenty of pilots have failed to take the time to analyze trouble signs and have had extra sweat. Like the young lieutenant who stopcocked a perfectly good engine because he suddenly noticed the RPM was zero. He tried an airstart, got no indication of RPM and again shut the unit down. He made an excellent flameout landing which made it easy to locate his trouble . . . a broken tachometer!

How about the old head who ejected from a perfectly good F84 after sunlight (apparently) reflected off the fire warning light? He had listened to too many stories about birds blowing up a second after this light came on. Stories no better confirmed than the light!

Along this line, you also learned that it doesn't always pay to head back for an immediate landing from many emergencies . . . that a heavy fuel load will just compound your difficulties, as long as your problem isn't a fire or something which will compromise engine performance. Yes, flying is a business much like the story about the old bull and the young bull . . . and more often than not, it pays to walk down to the gate instead of jumping the fence and running across the pasture.

But tell me, if flying emergencies seldom require a fast response, how come you spend so much time reading and re-reading AOIs? Also, why do you spend all that effort going thru the motions of a panic ejection or aborted takeoff emergency while waiting for an ATC clearance or otherwise killing time in the cockpit? Is it because some emergencies do require a prompt and proper reaction—after a prompt and accurate evaluation—and that the only way to insure that reaction (from a normal mortal with normally slow reflexes) is thru constant drill and simulated practice?

Good talking to you, and see you around . . . for a long time. TAC ATTACK

FROM AIB FILES

YUKON and ARGUS

Inadvertent Inflation of Life Rafts

Because of the inadvertent operation of the wing-stowed life raft, all release mechanisms in the Yukon and Argus aircraft have been checked mechanically and all dual squid cartridges have been removed. This action was taken as a temporary measure until a new release unit could be procured. It is intended to replace the faulty release mechanism with a new unit that is manually operated only—one that we know is reliable.

Yukon Main Wheel Failures

There were no Yukon wheel failures reported during Jul-Aug-Sep. It appears that this reduction in failures can be attributed directly to the systematic inspection of all wheels using ultrasonics and dye penetrants. These checks have also permitted the full utilization of wheels with only minor cracks. However, the problem may not be completely resolved; your continued surveillance is solicited.

CF104

Nozzle Failures and Flight with Failed Nozzle

In recent months there has been only one case of nozzle failure in flight. This occurred at 3 Wing, and after successful AB light a safety precautionary landing was completed.

CEPE have been carrying out exhaustive flight trials with an open nozzle to produce better information for pilot use—the report of their findings should be available soon. We'll pass it to all users as soon as possible.

T33

Fuel Feeding Problems

Sticking float valves and sticking transfer solenoid valves are still giving us failures of main wing tanks to feed when selected. Drilling a small hole in the non-return valve upstream of the float valve appears to be doing some good, but the problem is still with us. CEPE is investigating the complete fuel system in an attempt to come up with a permanent fix. Meantime, watch your fuel feeding and know the action you should take when a miss-feed occurs.

Fire Warning Lights

There have been many cases in the last few months of in-flight overheat and fire warning lights. The great majority have been false but a few have been caused by ruptured air casings. Don't take a chance and assume a false indication; follow the AOI procedure and land as soon as possible.

Parachute Automatic Release

The recent SI on all parachutes used in the T-Bird was called up when a chute failed to deploy as advertised, following a pilot forgetting to undo his lanyard as he left the aircraft. Binding within the auto-rip mechanism was found to exist.

All clearances have since been checked and one other case discovered. It pays to report these occurrences!

TUTOR

Foreign Object Damage

Ten Tutor engine changes were required by mid-October because of FOD damage. In all in-flight cases the engine continued to deliver power, and although vibration was present, safe landing was possible. One case of suspected FOD caused a compressor stall accompanied by an audible pop, rising EGT and a reduced RPM. The stall was cleared by reducing power to approximately 70%. This particular type of FOD is dangerous and expensive; and to quote an old but most applicable cliché "Eternal vigilance is the price of safety".

CH113

Engine Water Ingestion

Both engines of a CH113 were damaged by water ingestion during recent water operations. The damage was caused by the first stage compressor blades bending forward and touching the trailing edge of the inlet guide vanes. Although it is considered that this damage was due to a unique set of circumstances and a repeat is unlikely it is considered prudent to alert pilots to the remote possibility of damaging engines of the present configuration. A modification which will be incorporated in RCAF engines on first overhaul as E010B-20B-6B/22 should make these engines practically impervious to water damage as experienced in this case. This modification increases the clearance from .040 to .423 inches, clearance taken between IGV and first stage rotor blade at tip of blade to base of IGV. Note: although this modification will probably prevent damage it will not preclude flame-out where there is sufficient drenching to cause compressor stall as happened in the above incident.

CH112

Connecting Rod Failures

Recently the fifth failure of a connecting rod resulted in grounding of the fleet. New re-designed connecting rods may be the answer to the problem and installations have been underway since mid-October.

A definite relationship between failures and operating and maintenance procedures has not been established but areas for consideration are:

- power recovery from auto-rotation. We know this imposes a maximum strain on the engine.
- anti-torque couplings. Four of the five engines were in aircraft with anti-torque couplings installed. Only five Canadian aircraft have these installed. Investigation continues.

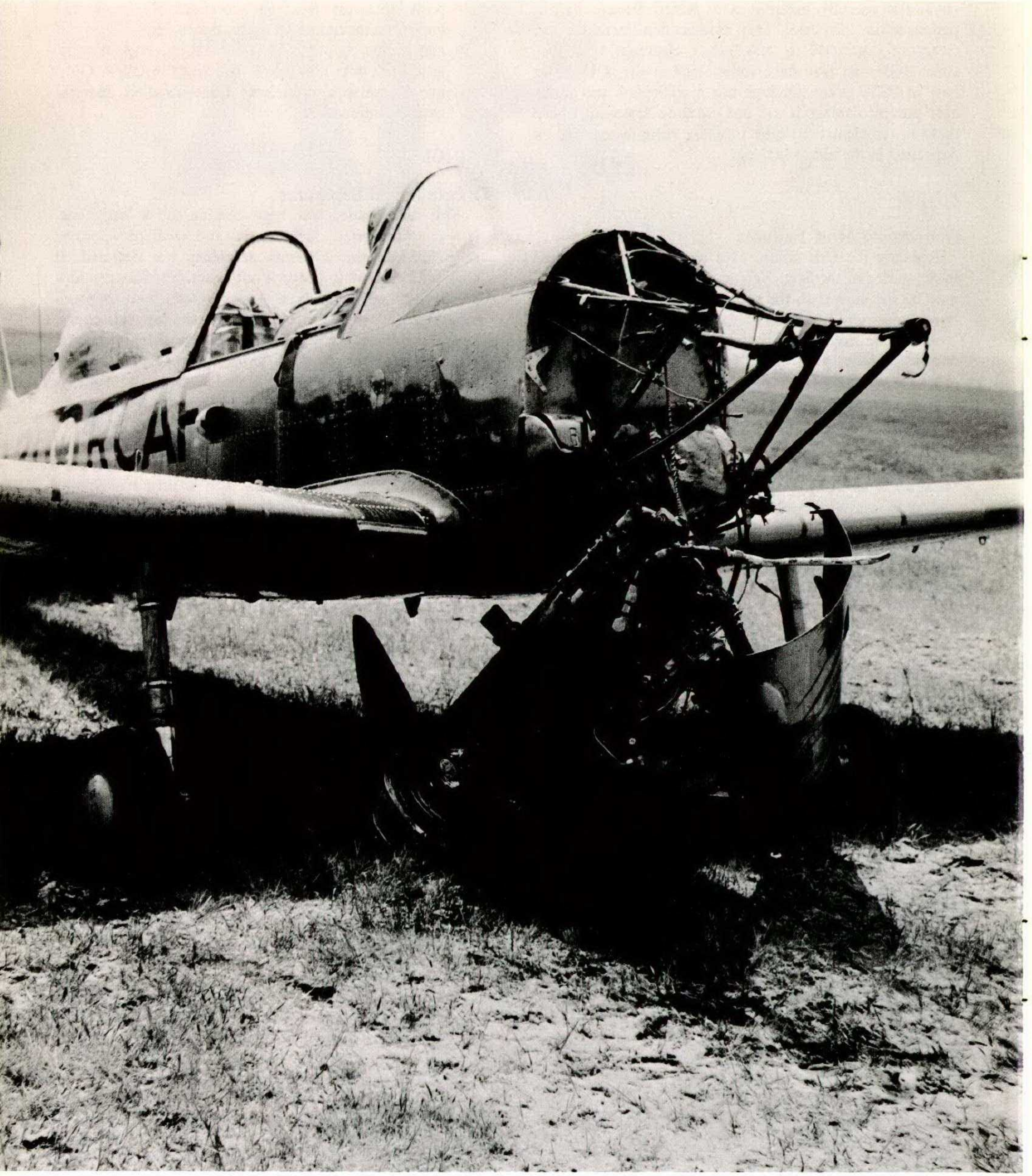
CF101

Ejection Seat Separator

This modification has been coming for a long time. It was static tested, flight tested and received approval in 1961; however, a design deficiency was detected. It took until Apr 64 to prove it out again. The kits are now being installed. This is a gas-operated "butt-snapper" separator and goes into operation as the lap belt opens. There is no change in aircrew procedures whatsoever. Remember when you feel that snap in the butt let go the "death grip" on the handles and you'll separate easily.

"Flash-Back"

"It's all clothing stores had left in my head size."



Forced Landing - Power Off!

It was an ideal day for flying—sunny, clear and warm. The Chipmunk was at 4500 ft and things were going fine. F/O MV Thompson, the instructor, was in the process of demonstrating a stall to Lt RF MacDonald, an Army student in the front cockpit, when BANG!! "We've lost the engine", yelled the student. And they certainly had, almost literally. It was still there, but barely—hanging on only by its fuel lines. Lt. MacDonald had only 11 hours on type but he was learning fast! A quick decision had to be made; but let F/O Thompson tell the story.

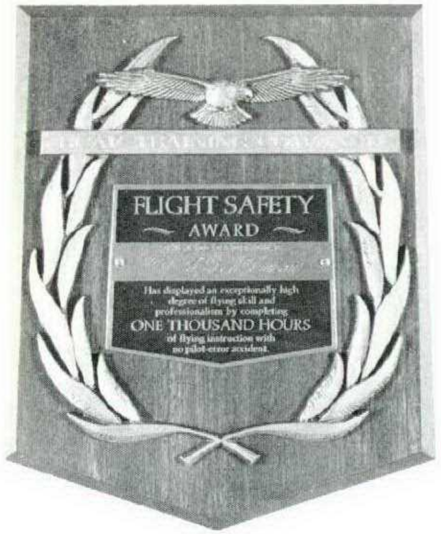
"After recovery from the secondary stall, I completed the demonstration of a high-speed stall in steep turn to the right. During the recovery I had regained a climbing attitude, advanced to full throttle and was adjusting the mixture when a loud report from the engine area startled me. Severe juddering began coincident with the explosive sound. The engine stopped running and oil began spattering the right side of the windscreen."

"At this time some debris flew over the cockpit to the left rear of the aircraft, then the juddering ceased. The student, who was in the front cockpit, said, 'The engine has fallen off'. From my position in the rear cockpit I could see neither the propeller nor the engine. The student reiterated his remark, seeming unsure of my awareness. I attempted to report our predicament to the tower, not realizing control of the VHF was in the front cockpit. Fearing fire, I turned off the fuel. Then I took control of the radio and advised the tower that we had engine failure, and that we were proceeding to St Joseph's airfield (abandoned). After the second attempt the tower acknowledged."

"My altitude at this time was 3300 ft indicated and I could see St Joseph's clearly. I believed that an overhead pattern would be possible but our glide angle to maintain airspeed was uncomfortably steep. Oil on the windscreen was hampering my vision, so I opened the canopy fully. Windblast in my eyes proved even more detrimental to my vision, so I closed the canopy to one-half, with some difficulty. It became clear to me by this time that an overhead pattern would not be possible and I elected to land straight ahead. I lowered full flap at this time (1600 ft). Then I noticed a fence on the other end of the field to which we were committed, and made a slight heading alteration just prior to touchdown. During the landing roll the aircraft crossed a deep rut, slowed sharply while crossing a ditch, and stopped a few feet beyond the ditch. We cleared the aircraft quickly, after turning off all switches. After standing clear for a few moments, I returned to the aircraft to read the forced landing instructions. Then I proceeded to a nearby farmhouse, and phoned RCAF Station Centralia. Since the student seemed shaken by the happenings, I asked him to accompany me, which he did. We returned to the aircraft within 20 minutes."

Although the aircraft was damaged in the nose section when it struck a ditch and the final ride was very bumpy, neither pilot was injured. F/O Thompson is to be commended for making a successful forced landing under extremely hazardous conditions. The engine had been torn from its mounting leaving it suspended only by the fuel lines. A blade had been thrown off the propeller and the resulting imbalance had torn the engine free of its mounting. The aircraft had been controllable all the way down its "power off" descent although its glide angle was much steeper than normal because of the extra drag of the hanging engine.

F/O Thompson had another alternative which is worthy of consideration here while we're on the subject. From the photo it is pretty obvious that good fortune alone held that engine in place. Had the engine fallen free, the aircraft would have become uncontrollable due to (among other things) a drastic shift in the centre of gravity. Under these circumstances it becomes worthwhile to consider the obvious alternative—bail out. There was in this case the very real risk of the engine parting company at too low an altitude to bail out. This "hairy" ride would then have had something other than a happy ending.



A/V/M CH Greenway, AOC TC, presenting awards to members of the Flying Instructors School, Moose Jaw.

Training Command's Instructor Award Programme

Training Command recently introduced a new policy in the field of aircraft accident prevention by instituting an Instructor Flight Safety Award Programme.

The majority of aircraft accidents can be attributed to pilot error. Disciplinary action is one corrective measure, but is only applicable in cases where pilots have violated regulations, or have committed careless or negligent acts. Not enough recognition has been given to those instructors who have demonstrated a truly professional approach to their duties, and who have completed many hours of flying instruction without an accident. The purpose of the TC Flight Safety Award Programme is to commend these officers and thereby encourage all flying instructors to be more flight safety conscious.

The two awards are based on the number of instructional hours flown free of pilot-error accidents. The plaque is presented to instructors who have flown 1000 hours or more, and a scroll for 500 hours. Officers who are employed currently at pilot flying training schools are eligible.

The exposure rate to aircraft accidents is very high in the pilot training role. There are those however, who have flown impressive numbers of hours with students and have never had a pilot-error accident. One officer has logged over 6000 hours of accident-free instructional flying. Accomplishments such as this are certainly worthy of formal recognition.

Training Command employs at the present time, well over 500 pilots as flying instructors. Eighty-five of these officers have been presented with the 1000 hour plaque, and 109 received the 500 hour scrolls. These instructors have executed their duties in a very professional manner, and have set a good example for students and other instructors to follow. The award programme aims at maintaining the present high standards of instruction while promoting the reduction of aircraft accidents.

S/L HE Brown
SOFS TCHQ

The Other Side Of The Fence

We the members of a Servicing section, are beginning to think that we are becoming no more than a necessary evil to our transient crews. Seldom do we see an article that gives praise to the Servicing section. We decided it was about time that our side of the issue was presented.

Behind the scenes

Our favourite gripe seems to be that it takes the Servicing section so long to determine how long it will be before an aircraft will be ready to go. We suggest that the pilots try to find out exactly what goes on to "turnaround" an aircraft. For example, the refuelling truck may be busy somewhere else, or one of the needed tradesmen is busy elsewhere. A flight crew does not have to do business with as many sections as Servicing. In turn each section has more to do than just wait for transients or rectify a preferred aircraft for our travelling "weekenders".

A real sore point with Servicing types is the abuse of our working hours by our "weekend flyers". When asked for an ETA upon departing, the immediate reply is, "oh, sometime before 1700 on Sun". Let us hope that most of the reasons are legitimate when they roll to a stop on the ramp, long, long after five.

Parking preferences

Among our problems is the pilot who thinks he should be parked in front of Ops. A glance at the parking ramp should tell him that if we were to keep special parking places open for one and all, that operations on the line would reach the chaos state in no time at all. What is it that our flyers of today have against that healthy sport of walking?

Quick turnaround

Then there's the driver who wants a quick turnaround because he's leaving in 30 minutes. Does he consider that Servicing could be shorthanded, with only four or five men to handle a full ramp? Not on your life! He just hits the ceiling when we tell him it will be at least an hour before his aircraft will be ready.

There's another type of driver who wants a quick turnaround, and will also be leaving in 30 minutes. When he gets to Ops he meets an old buddy and decides to have a cup of coffee and catch up on the news. Before he knows it, two hours have come and gone.

Just as bad as the late-comer is the pilot who says he won't be leaving for at least three hours. When he comes back 45 minutes later and his aircraft isn't ready, he wants to know why. He had said he wouldn't be going for three hours, meanwhile Servicing are working on other aircraft. "Well", says the pilot, "I changed my mind".

Worse yet is the jockey who brings his bird in and won't be leaving until 1100 the next day. During the night he changes his mind, so he comes into Ops about 0730 and files out. He gets to Servicing only to find out it isn't ready and wants to know why. When he is told that Servicing wasn't notified of his change of plans, he says he forgot.

There are plenty of legal reasons for not meeting an ETD, and this we aren't complaining about. But why can't Servicing be told when these changes are made? When the pilot doesn't call us to change his departure time, we haven't any idea what has happened when he doesn't show. It's no use to call Ops; as far as they know, he left an hour ago.

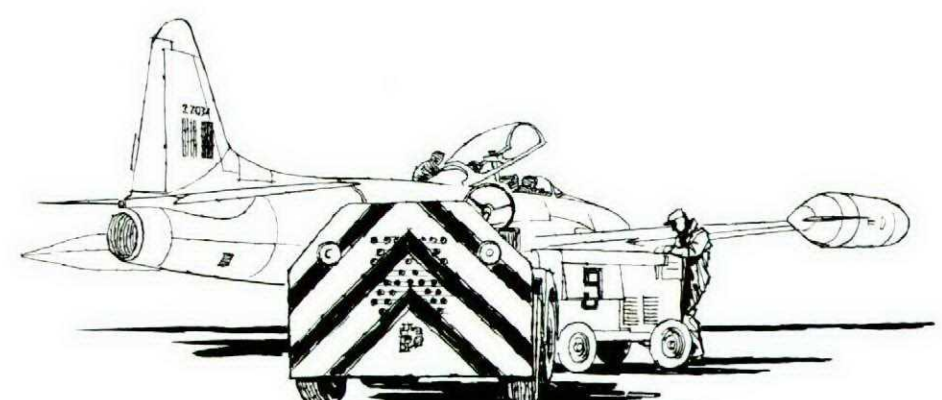
Summary

Of course these are only examples of a small minority. We all have jobs to do, some of them more important than others. Whatever the situation, we have to work together. We are not begging for sympathy, we are asking for Co-operation.

SERVICING

Editor's Note:

This was noticed hanging on the wall at RCAF Stn Bagotville. Seems like Servicing has made a point—anyone care to have a go from the other "other-side-of-the-fence"?



ARRIVALS and DEPARTURES

TRACKER—ICE ON WINGS "I was on duty in the control tower and as the Tracker started to roll, I glanced at the clock to record its time off. The takeoff seemed OK, but a little longer than normal. Finally, after about 3000 ft, the aircraft got airborne, climbed to about 50 ft and then started a slipping turn to the right. The aircraft was flying erratically and it was obvious the pilot was having control difficulties. The aircraft straightened out, levelled off at an altitude even with the tower, and although still flying erratically started coming straight at me. I started for the ladder so as to leave quickly if the aircraft did not change course or gain altitude. It got so close that I could see the pilot clearly but then began to climb slowly. It passed just overhead and then descended rapidly although still in a nose high attitude. The tower supervisor was ringing the crash alarm as the aircraft hit the ground at the edge of the airfield boundary. There was no fire and fortunately no one was injured."

The pilot felt sure that something was wrong with the controls, the rudder especially. However, a thorough check of the aircraft indicated that they were all serviceable. The investigation found that the crew attempted takeoff with an undetermined amount of thin ice mixed with snow in patches on the wings and possibly the tailplane. It was concluded that the aircraft crashed due to inadequate lift and control. The patches of ice and snow remaining on the aircraft were sufficient to interfere with the airflow over the lifting surfaces.

The aircraft had been left out overnight; some wet snow and light freezing rain had frozen to the aircraft. The three pilots on the flight stated they had "looked it over carefully" during their preflight inspection and had chipped most of the ice off. They were sure that the ice remaining would have negligible effect. The captain mentioned somewhat jokingly that he would add ten knots to the takeoff speed just to be sure.

This near-tragic accident provides an excellent warning, especially at this time of the year, of the considerable reduction of lift caused by ice or hoar frost on wings. Also, that ice on the fuselage can cause a real loss of effective thrust (Drag) just when this power is most needed.

It might not look like much but why take a chance? Just a little on a high-lift wing can have drastic results.

L19—GROUNDLOOP The aircraft had returned from a routine mission and the pilot was preparing for a landing in gusty conditions. During the landing roll a gust attributed to the pilot as coming from "a gap in the buildings and trees" near the runway lifted the port wing slightly. Another gust reinforced the action of the first and caused the aircraft to skid sideways on the grass surface. "Power was applied to attempt skid recovery" and the starboard undercarriage collapsed causing damage to the starboard wing, propeller and fuselage.

The pilot admits that he should have overshot rather than let the groundloop develop.

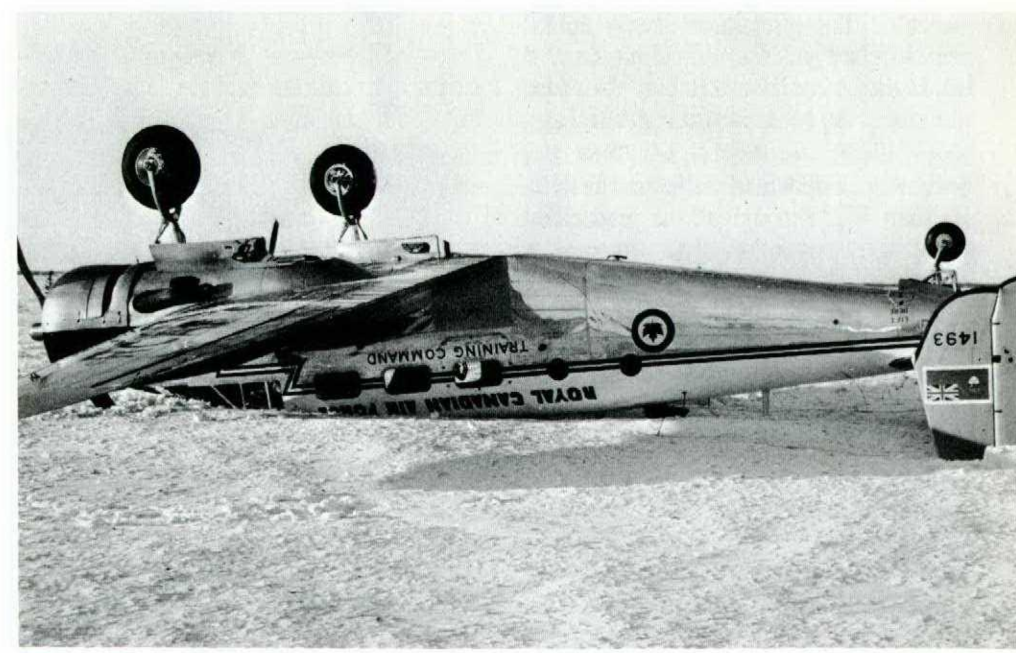
Pilots must be aware of the point beyond which power can cause nothing but increased damage and hazards. A long-standing debate on this matter has resulted from similar experience with Mr Groundlooper himself, the Harvard.

TUTOR—JETWASH ON FINAL "I was on final in a Tutor about 300 yds behind a landing T33. The wind was calm, and I was about 100 ft above the ground with 115 kts airspeed. Suddenly the aircraft rolled violently to nearly 90 degrees of right bank and then just as abruptly to 90 degrees of left bank. Finally I got the wings level, pulled up out of the jetwash and made a normal landing."

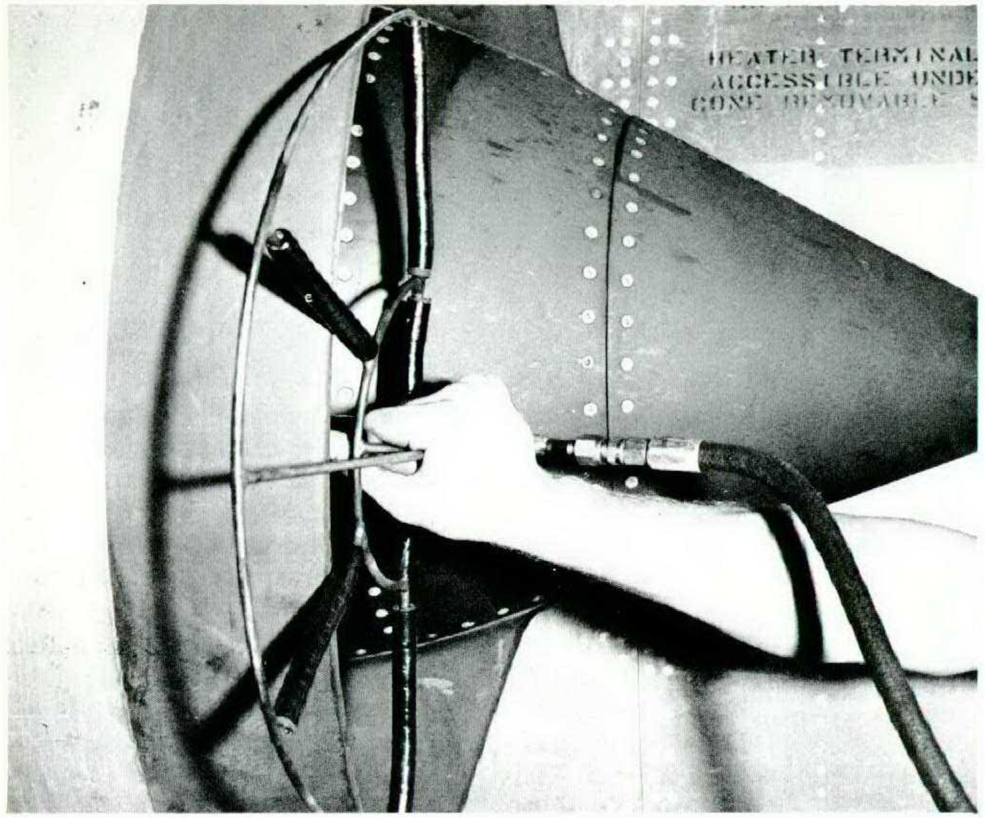
Is this just another close call because a pilot got into the jetwash of the aircraft ahead? Basically it is, but it points to the fact that the susceptibility of an aircraft to jetwash is proportional to its wing loading. And the Tutor is quite a light aircraft. The Tutor's T33-like performance may create the erroneous impression that it will behave similar to the T-bird in all flight conditions, hence the surprise at its violent reaction to jetwash.

Incidentally, the intensity of the turbulent "wake" behind an aircraft is proportionate to the weight of the aircraft making it; the power setting of the engines contributes only a small portion. The Tutor has good aileron response and is really no more susceptible to jetwash than any other aircraft of its weight. This and several other similar occurrences reminds us that it is only good airmanship to stay out of the jetwash or slipstream of other aircraft.

EXPEDITOR—UPSIDE DOWN On the landing roll the instructor handed control over to the student and instructed him to overshoot. At about 40 kts with full power the instructor retarded a throttle to simulate an engine failure. The Expeditor swung sharply towards the runway's edge and could not be controlled. The aircraft continued across the infield coming to a halt by flipping up on its nose and over onto its back. The instructor erred in retarding the throttle under conditions not prescribed in the training syllabus. This accident has a painfully familiar ring. The courage of some instructors is something to behold.



CF104——POOR BRIEFING While performing the CF104 anti-corrosion control, the technician holding the spray bar nozzle allowed it to come into contact with first stage compressor blades which were winding down, but



Showing spray nozzle with modified guard. Impossible to go past outside of Air Duct and maintains correct clearance between nozzle and front frame.

still rotating at about 15%. The nozzle only just touched the blades, but that of course, is all it took to cause very expensive damage.

Was it straightforward carelessness? Well, partly, but the real cause was briefing. While the anti-corrosion procedure was in progress it became necessary to change one of the men. The sergeant in charge of the shift had not ensured that all his personnel had been briefed on corrosion control procedures. The corporal in charge of the actual operation, in turn, accepted a replacement without ascertaining whether the man had been briefed. Finally the airman himself was at fault for failing to inform his supervisors that he had not been briefed on how to use the equipment. The station as a whole was tagged for a contributing cause factor of "briefing" because the danger of inserting the nozzle too far and striking the blades had been pointed out by message and a modification was "suggested".

A modification to eliminate a hazard of this order should be regarded as "mandatory and immediate" even if the message used the softer "suggested".

CF104—FOR WANT OF A PIN WE LOST THE.... While on a low-level exercise, the CF104 suddenly yawed violently. The pilot immediately pulled up, switched off the yaw damper and tried the trim control but the yaw remained. By looking through the rear-view mirror he could see that the rudder was deflected fully to the left. He then went through all the prescribed procedures but to no avail, the rudder remained fully left, the ball fully right and although the rudder pedals would move, they had no effect whatsoever.

The pilot declared an emergency, headed for base and requested technical advice from the tower. Finally, after about 40 minutes, a technical adviser arrived in the tower but he was able only to suggest procedures that had already been tried by the pilot. As it turned out, the long delay was of no consequence; the pilot could have done

nothing to correct the rudder malfunction.

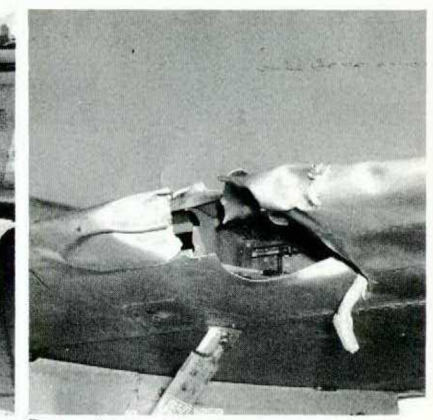
The pilot was faced with a critical decision: attempt a landing or bail out. He found that he could retain control down to 190 kts but at this speed about 15° of bank was required to hold a heading. An approach was attempted at home base where there was a 90° crosswind. Just before touchdown at about 50 ft he found that excessive bank was required to keep on runway heading and had to overshoot. The pilot diverted to a nearby USAF base with a runway into wind. However, when he picked up the runway visually at 1½ miles, a 150° turn would have been required to line up. By this time, fuel was down to 400 lbs and the area heavily populated. The pilot decided another approach under these circumstances would be unwise. He proceeded to the bailout area and with a fuel state of zero, ejected. Everything worked as advertised and the pilot landed in trees with only a few minor scratches and bruises. The aircraft crashed in open country and caused no damage.

Inspection of the wreckage revealed that a cotter pin had not been installed (probably during manufacture) in a bolt in the rudder assembly. However, the missing cotter pin had escaped detection on two periodic inspections. The bolt had worked free and a spring had pushed the rudder to full left deflection. During flight the pilot, of course, did not know what was causing the deflection. Also, he could not be sure he had nosewheel steering or brakes. To land under these conditions could have been extremely hazardous. The pilot coped with his emergency in a professional manner; he described his problem accurately and early and it is no reflection on him that much time was lost while he waited for technical advice. Although the advice from the ground could not have rectified this particular problem, had it been available earlier it would have left more fuel (and time) to experiment in landing. An Emergency Advisory Committee has now been formed to deal with in-flight emergencies. A unit not having such a committee should give some thought to forming one. The price of not having advice "on tap" is too high, as this account painfully demonstrates.

F86—LOW LEVEL AEROS On completion of a solo handling exercise which was to include practice bomb runs, the aircraft checked in with the Range Officer for clearance into the bomb release area. Following the bomb release manoeuver the pilot performed a 360° roll at low altitude. The aircraft recovered from this manoeuver in a nose low attitude and flew into the trees suffering extensive airframe damage.

It is hard to understand why this experienced pilot performed the unauthorized roll in the first place, but it is even harder to understand why he did it so low that he came within a hair's breadth of killing himself. Was it impulse? A desire to show off? An attempt to impress the Range Officer? He doesn't really know himself, and in any case it is hardly the performance expected of a professional pilot.

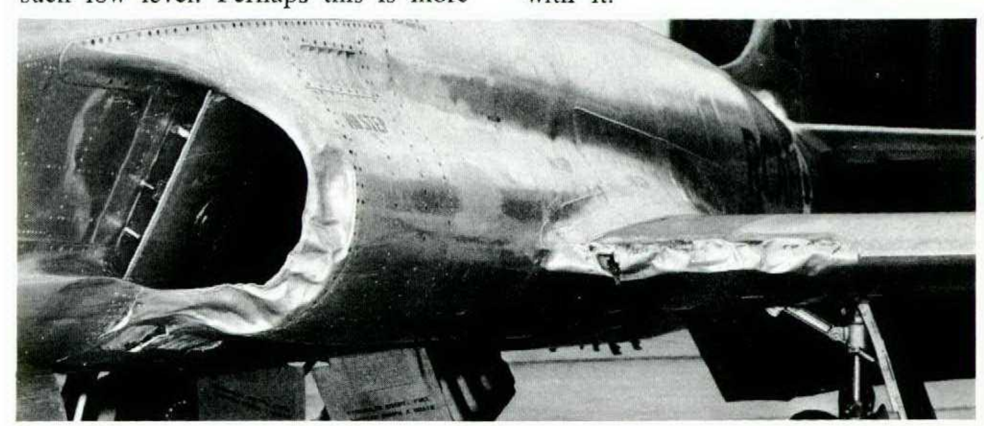
Stbd wing



Port wing

T33—HIT THE TREES The pilot, an experienced instructor was temporarily employed on a tactical support exercise with the Army. Following a low-level attack on a ground target a pull-up turn was executed to position himself for another run-in. It was during this manoeuvre that the pilot "inadvertently got into a vertical dive at approximately 2500 ft with an airspeed of 200 kts". Full back stick pressure and full power was used and a nose-up attitude was obtained, but too late. The aircraft mushed into the trees causing extensive airframe damage. It was landed successfully.

The hazards of this type of low-level flying are recognized but violent manoeuvres too close to the ground can be deadly. Temporary disorientation was quoted as the cause of this accident. But it is difficult to understand how a pilot with 1000 hrs on type would get in a vertical dive "inadvertently" at such low level. Perhaps this is more a case of the pilot trying to put on a realistic "attack" to the troops on the ground, but not being properly trained for the job. Anyway, as the photo shows, he was sure lucky to get away with it.



BRISTOL — NEGLECTED MOD

Descent clearance was received and as the Bristol pilot reduced power to begin descending, the port prop went to the feathered position and gradually came to a stop. An emergency was declared, the port engine shut down and an uneventful single engine landing made.

The crew handled this situation well and it really was "no sweat". But the loss of an engine on a twin aircraft can sometimes get pretty dicey. The disturbing thing about this incident is that mod kits were available nine months before to rectify this very problem. Through a mix-up the unit received the wrong kit from the factory and since the Bristol was soon to go out of service no one bothered to procure the proper kit. This demonstrates that when a modification to improve the safety of an aircraft has been ordered, it should be carried out as soon as practicable. A crash on a last flight is no better than a crash on a first flight.

LETTERS TO THE EDITOR

Dear Sir:

With reference to F/L GW Moore's letter in the September/October issue of Flight Comment, I feel that since you printed his personal comments on my supposed attitude towards Flight Safety, I am entitled to a rebuttal directed to my accuser.

Without further ado then! I am accused of expounding at great length on the Harvard groundloop. Surely, Sir, you as an ex QFI must agree that the 500 words in my letter merely gloss over the knowledge included in an acceptable briefing on groundloops. Expound I will accept; at length, I deny; at great length, the charge is preposterous.

You go on, Sir "I too am an Ex Harvard instructor . . . who has never had a groundloop". Since I am accused of an "out-and-out holier than thou attitude" I must ask you 'who told you that I had never had a groundloop?' If you gained the impression that what I had to say was based purely on my personal record as a Harvard QFI, then you are sadly wrong. My personal prowess as a pilot is not under debate since all that I had to say was merely reiteration of what can be read in both the students' and instructors' handbooks. Developing an emotional attitude towards such information as was contained in my letter will not help us to eliminate groundloops.

For your further information, F/L Moore, crossing your fingers and touching wood was not responsible for your 2000 groundloop free hours. Whether you believe it or not, you must have been a competent pilot who stayed alert on landings. Should you care to discuss groundloops further, and not personalities, I will be most happy to oblige. I might even tell you whether or not I ever groundlooped.

My statement, first made long before I finished instructing, still holds "if you are competent and stay on the ball, you will not have a groundloop on the Harvard aircraft".

F/L JB Peart
Stn Winnipeg

Dear Sir:

The article in the Sep-Oct 64 issue of Flight Comment "Final Talk-Down to Bristol 9697" suggests that many aircrew have put their complete trust in GCA. The antithesis is true of ILS procedures; here the glide slope is flown and cross checked for serviceability against altitude over the outer and inner marker.

RCAF aircrew have been encouraged to double check GCA approaches against an ILS facility whenever equipment is available but not against altitude. This oversight may have cost the RCAF a valuable crew and aircraft and it should provide the necessary incentive for pilots to cross check their GCA glide path altitude against the controller's statement of distance from touchdown. The simple rule-of-thumb stated in the Flight Comment article is excellent and pertains to a 2.5 degree glide path; tabulated data covers the three degree case. There are other glide paths in use and it is considered that a more permanent form of representation is required.

The philosophy and information contained in Flight Comment's "Final Talk-Down to Bristol 9697" is excellent, however wider application and coverage of a GCA cross checking procedure might be achieved through Fig 2's inclusion in an appropriate service publication. It is therefore recommended that GCA glide slope information be incorporated in GPH205 section B12.

S/L RS McClean
Winnipeg Man

The information referred to is contained in CAP342, Vol II, but as this pub is usually not readily available to pilots, S/L McClean's suggestion might be a good one. Anyway, it has been passed on for consideration. Another idea is to have GCA say at least once during a precision approach the altitude the pilot's altimeter should be reading—Ed.

BIRD WATCHERS' CORNER

TATTERED-TAILED TWIRLYBIRD

Principal habitat of this genus of twirlybird (Rotorus Terraflarum) is any practice autorotation area where hapless birds may be seen writing off tail rotors, and sometimes themselves, in drag-tail low-level flareouts. Terraflarum has a fatal weakness, it attempts to duplicate the precision flying capers of the Happy Hovering Hummingbird. "Pride cometh before a fall"—alas, our bird can twirl, but hum, it cannot. The Happy Hovering Hummingbird, for his part, attributes his longer life-span to an inbred disdain for the flighty friskiness of Twirlybirds who seldom evidence the necessary flair for good judgement their kind of flying demands.

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