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FLIGHT COMMENT

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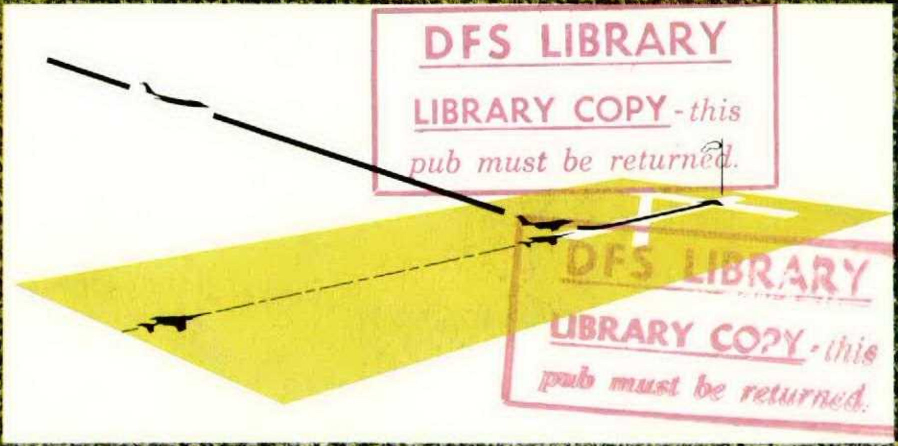

FLIGHT COMMENT

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ROYAL CANADIAN AIR FORCE
DIRECTORATE OF FLIGHT SAFETY

SEEING the SHEAR

Starting his final approach at about 1500 feet, a pilot finds himself heading into a stiff wind. Because the wind provides a substantial part of the necessary airspeed, he throttles back his engines. Suddenly, a few hundred feet above the ground, the wind dies. Only a fast increase in power prevents the airplane from stalling and crashing. Right?

Or is this right? Starting final into a stiff wind the pilot finds he has to carry extra power to bring his plane up to the runway. Suddenly, a few hundred feet from the ground, the head wind dies out. Only a fast decrease in power prevents the aircraft from overshooting.

Or how about this version? Starting final into a stiff wind the pilot finds he has to carry extra power to maintain a normal glide path toward the runway. Suddenly, a few hundred feet from the ground, the wind dies. Only a fast increase in power prevents the airplane from stalling and crashing.

If there is any doubt in your mind as to which of the three cases above is correct (or if there is no doubt, but you are wrong), read on. There are things you should know about the wind shear.

NORMAL GLIDE PATH

Figure 1 illustrates a normal glide path profile with a 3 degree glide path from the glide slope unit crossing the outer marker at 1000 feet. This gives a glide slope distance of 3.14 nautical miles from the outer marker to touchdown point. For our typical case we have chosen headwinds of 20 knots at 1000 feet and 10 knots on the surface. Speed selected is 140 knots over outer marker, tapering to 120 knots at touchdown. These conditions are considered as typical and will be used as standards for analyzing abnormal wind conditions in later examples.

From Figure 1 we can compute that the elapsed time from outer marker to touchdown in this case is 1.64 minutes, which results in an average ground speed of 115 knots and an average rate of descent of 610 feet per minute. Also, normal airspeed deceleration from outer marker to touchdown is 20 knots and the ground speed deceleration in this case is 10 knots. The change in ground speed becomes a very important consideration when analyzing abnormal wind shear conditions because it

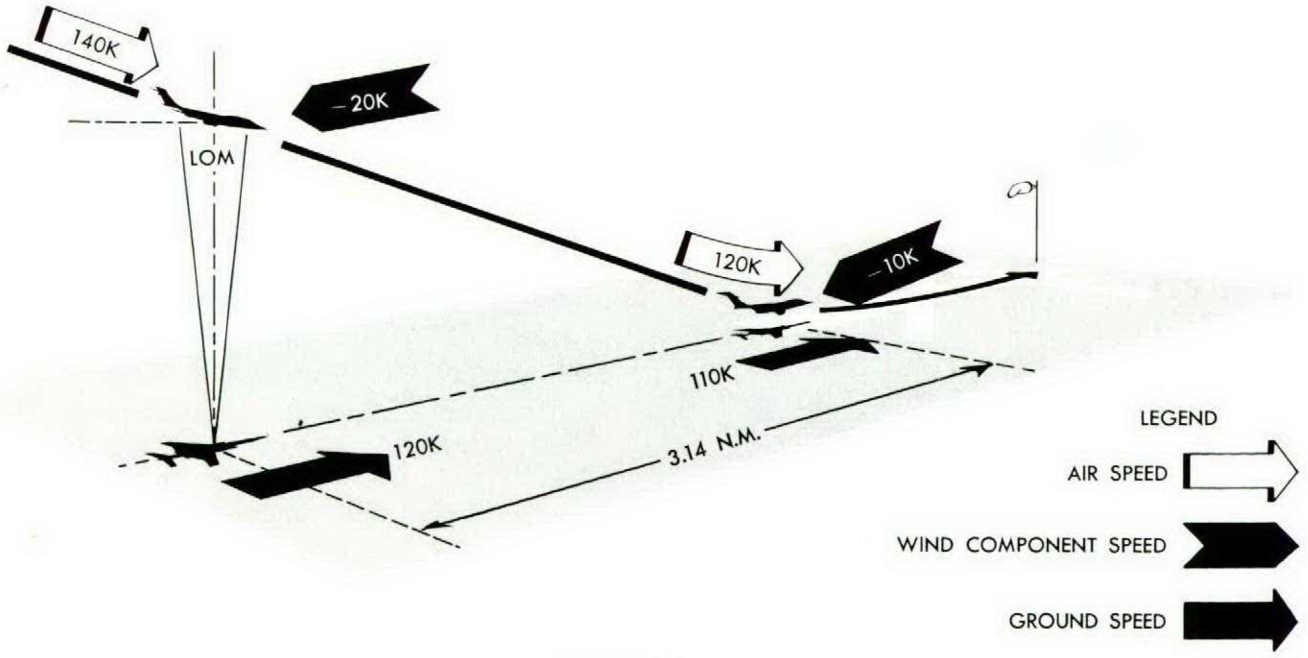


FIGURE 1

involves the problem of rapidly accelerating or decelerating an aircraft mass of up to 150 tons during the landing approach.

TAILWIND APPROACH

In Figure 2 we consider an abnormal tailwind approach in which a 40-knot tailwind exists at the outer marker with a zero surface wind. As can be computed in this case, the average ground speed from the outer marker to touchdown is 150 knots, which results in an elapsed time of 1.24 minutes and an average rate of descent of 800 feet per minute for a precisely executed approach. Comparing this example with Figure 1, we see that while the airspeed is decelerated 20 knots in both cases, the ground speed in the latter case must be decelerated 60 knots in a faster time than the 20 knot deceleration in the normal approach of Figure 1. This is the root of the problem, for whenever the wind environment changes faster than the aircraft mass can be accelerated or decelerated, the wind variations must be reflected by changes in airspeed. In the tailwind situation depicted in Figure 2, should the pilot be unable to decelerate his aircraft in the faster time required, he would find his airspeed had increased, very likely he would have gone above glide path in an effort to hold desired airspeed, and he would have to go around. (Assuming, of course, he wisely resists the temptation to land long.) One more point, the more gradual the shear the more likely the pilot is to be able to decelerate to remain on glide path and at desired indicated airspeed.

HEADWIND APPROACH

In Figure 3 we take up the strong headwind aloft condition. In this case we have a 40-knot headwind over the outer marker and a zero component on the ground. In this case we find that the average ground speed from outer marker to touchdown is 110 knots, which results in an elapsed time of 1.7 minutes and an average rate of descent of 580 feet per minute for a precisely executed approach. In comparing this situation with the normal profile approach depicted in Figure 1, we see that in the headwind shear approach the aircraft ground speed must be accelerated by 20 knots during the final approach instead of the normal 10 knot deceleration. Unless this acceleration is accomplished, the aircraft will sink below the glide slope and land short of the runway. Occasionally the shear will not be gradual but will occur rapidly. If the speed falls below stall speed the aircraft will lose altitude until it crashes or flying speed is recovered. Time required for acceleration to flying speed may exceed that available. To illustrate, following are calculations for a particular aircraft. Conditions are: altitude 1000 millibars, power setting constant, air speed 100 knots, headwind 20 knots. When the aircraft is instantaneously placed in calm air the times to accelerate to the indicated ground speeds are:

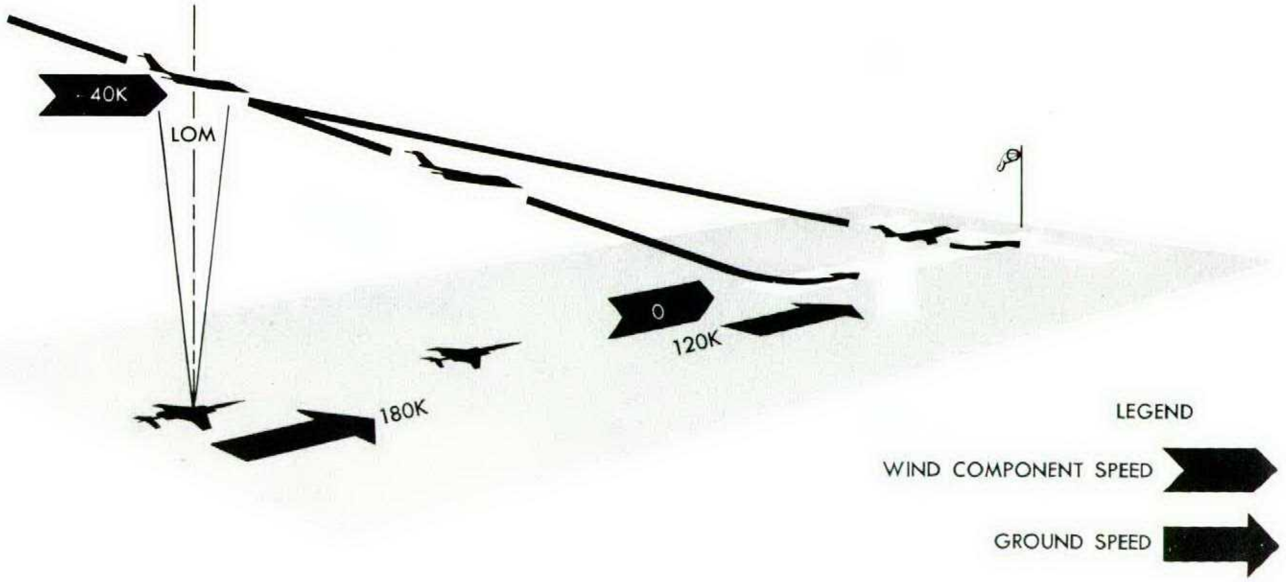


FIGURE 2

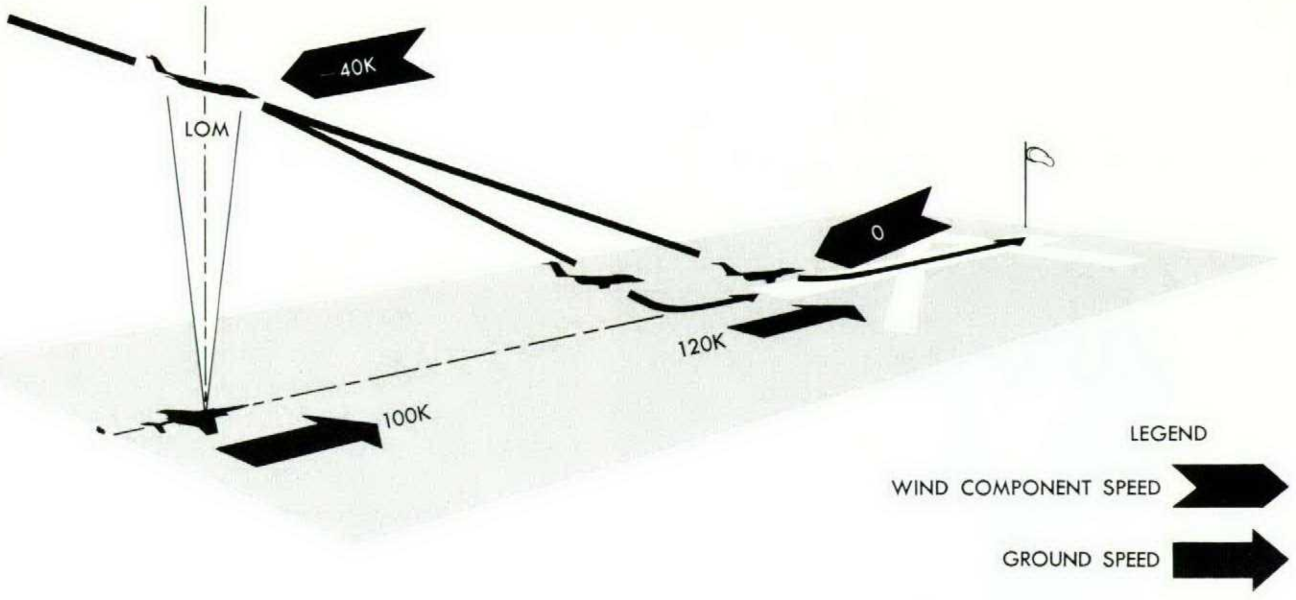


FIGURE 3

80 knots --	0	seconds
86 knots --	39.9	seconds
90 knots --	77.5	seconds
96 knots --	175.5	seconds

This computation confirms tests run with a Constellation in stabilized flight at constant altitude near the stalling speed in which it was found that nearly half a minute was required before any noticeable acceleration was observed following application of full power.

It appears that a safe landing speed from a headwind into a calm would be an airspeed equal to at least the stall speed plus the headwind component at approximately 1000 feet above the surface.

Aggravating the seriousness of a sudden decrease in headwind component on final approach is increased drag as angle of attack is increased to lower stall speed, with the possibility of entering the backside of the power curve (more power required to fly slower).

Pilots of propeller aircraft have a considerable advantage due to faster acceleration and a lowered power on stall speed due to increased airflow over the wings. Jet pilots must rely on increased airspeed alone.

The sudden loss of headwind component can also be disastrous on takeoff — takeoffs into thunderstorm shear areas have provided several examples of this.

WIND SHEAR IN TURNS

The effect of encountering a wind shift during a turn deserves special mention because of the possibility in certain cases of its simultaneous occurrence with other conditions which could compound the hazards. Effects can be: a rapid drop in airspeed; a sudden increase in angle of bank caused by the side component of the new wind environment acting upon the wing dihedral, down drafts. An analysis of meteorological conditions associated with squall lines had led to the conclusion that the simultaneous occurrence of the three hazards could normally be experienced in the Northern Hemisphere only in a left turn.

GUSTY WINDS

When winds are gusty the airspeed will vary in an amount equal to the difference between the lull and the peak gusts. For this reason it is wise to carry an added airspeed allowance in a gusty wind condition to help prevent experiencing a dangerously low airspeed. This is particularly important during approaches and when circling due to relatively high drag of an aircraft with gear down, particularly when in a banked attitude. Operating procedures manuals spell out allowances to be made, usually on the order of half the value of the gustiness up to a specified figure.

VERTICAL WIND GRADIENT

Due to reductions in wind speeds at lower levels due to surface friction, wind speed gradually increases from ground level up to the gradient level where surface friction is no longer effective. Another characteristic of wind gradient is the change in wind direction at low levels. In the free atmosphere the wind blows approximately parallel with the isobars, the lower pressure being to the left; but, in addition to reducing the wind speed, surface friction also causes the wind direction below the gradient level to flow somewhat across the isobars toward the lower pressure. As a result, the wind direction usually backs counter-clockwise from about 3000 feet to 300 feet, the magnitude averaging 20 to 40 degrees but reaching as much as 70 to 90 degrees in isolated cases. A rule which may help in areas where wind flow is not materially affected by terrain features and obstructions is: When the runway wind is from the right and is nearly a crosswind or has a tailwind component, the gradient wind usually has a stronger tailwind component. An extreme situation of this type in a tight pressure gradient could constitute an abnormal tailwind-shear condition for aircraft using this runway. Similarly, the frictional shift of wind direction below the gradient level also increases the wind shear in a headwind approach. In this case, descent below the gradient level magnifies the decrease in headwind component, which tends to also decrease the airspeed unless ground speed is accelerated to correct for this factor.

LOW ALTITUDE WIND GRADIENTS

Wind gradient effects normally benefit an airplane during takeoff, because as the plane climbs into increasing wind velocity the indicated airspeed increases faster than the airplane actually accelerates relative to the ground. Just the opposite occurs on landing. A high level headwind that decreases as the airplane approaches the ground causes a decrease in indicated airspeed that could, under certain conditions, allow the aircraft to touch down earlier than expected. As the airplane descends to the runway some bleed off in airspeed should be expected. During the last portion of the descent, a pilot should be prepared to add considerable thrust to accelerate the airplane in case the airspeed bleed off due to wind gradient is more than expected. A rule of thumb to partially compensate for wind gradient is to add one half the headwind to the approach reference speed, allowing the airspeed to bleed off rather than attempt to hold the approach speed plus the one-half headwind and gust correction factor (maximum of 20 knots total).

LOW LEVEL JET

The low level jet is a phenomenon most common over the flat terrain of the Great Plains that reaches a maximum during the middle of the night. In one reported case, at 1700 the wind at 900 feet was 28 mph, at 0300 the next morning it had increased to 67 mph and at the same time the wind speed 30 feet above the ground was 15 mph. Formation of this phenomenon is tied in with nocturnal inversions with wind above the inversion speeding up and giving birth to the jet. This condition, because of its magnitude and occurrence close to the surface, poses a low level shear hazard to aircraft.

Shear can also be expected from di-urnal cooling. The air close to the ground cools and settles, some fog may form, and about sunrise the upper air starts to move with the result that a low altitude shear—as much as 20 to 30 knots in 200 to 300 feet—results. This shear condition normally dissipates quite rapidly.

CLUES

Figure 4 provides an indication of clues to wind shear that the pilot can pick up in the pattern. Assuming a calm, or near calm surface wind, if crabbing as depicted in A or B is necessary, lateral shear can be expected on final. If crabbing is required as depicted in C, a tailwind component is present at pattern altitude and over-shoot problems, as discussed in the section on TAILWIND APPROACH, should be anticipated. If crabbing is required as depicted in D, a headwind component is present and a short touchdown potential exists if the gradient is large enough, and occurs rapidly during the final approach path.

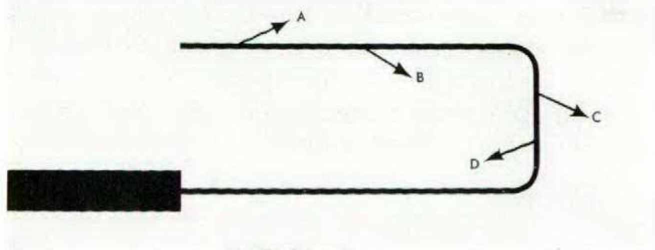
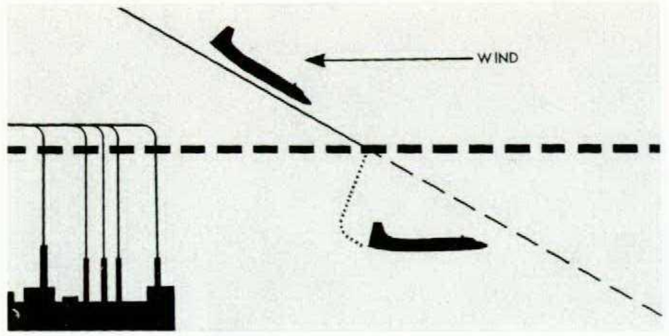


FIGURE 4



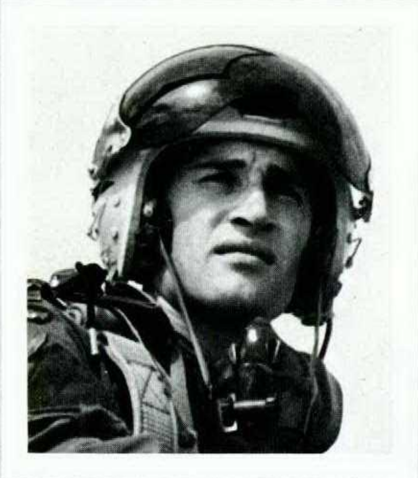
Shear can be anticipated whenever there is an inversion. (Fig 5). Shear is also a hazard potential with frontal passage and in and near thunderstorms. Severe down drafts associated with thunderstorms warrant delaying takeoff or landing when such storms are over or adjacent to the airfield. Shear should be anticipated when taking off or landing over cliffs, water, in hilly terrain and with large buildings or trees adjacent to the runway. Normally, the severity of such low altitude wind shear bears a direct relationship to the surface wind speed. Don't overlook the help you can obtain from the weather forecaster. Check with him before takeoff, and when you suspect shear, call him before making your final approach.

ANSWERS

By now we trust you have figured out which of the three conditions posed in the beginning of this article is correct. Also, you may have done some projected thinking and figured out that converse situations could exist. Suppose you have calm air at pattern altitude, but a surface wind. For example, as you start to flare from your calm wind final approach you encounter a 15-knot headwind. Now you have 15 knots more speed to bleed off before reaching normal touchdown speed, and face a go-around or long landing situation. And if the surface wind you encounter is a tailwind ... you've arrived, ready or not.

Apply wind shear hazard planning for the aircraft you fly. When you have strong surface headwinds reported, aim a bit farther down the runway. Ground speed will be less and roll out distance will be shortened. If shear is probable, a rather flat approach has been recommended by some in order to transition the shear area more slowly and allow more time for correction. If taking off into suspected shear, accelerate as rapidly as conditions permit until safely above stall speed.

FLIGHT SAFETY FOUNDATION



F/O S KERYLIUK

F/O S Keryliuk of Station Portage la Prairie, and a student were authorized to do exercise #34 in a T33. Everything was normal and the aircraft was cleared for takeoff on runway 30R. The takeoff roll was normal until airborne at approximately 100 kts when the red plenum chamber fire warning light came on, followed by the amber tailpipe overheat light. When both lights stayed on, F/O Keryliuk decided to abort.

Throttle and HP cock were closed and the aircraft touched down at about 100 kts. Braking was applied early but excessive braking action blew the port tire. At this point considerable effort and concentration were required to keep the T33 on the runways as it kept veering from left to right. As the aircraft passed onto the overrun it started veering left and stopped about 15 feet off the runway.

Investigation revealed an 8-inch square hole blown in #6 air casing. F/O Keryliuk is to be commended for the professional manner in which he handled this situation. He probably averted the loss of the aircraft, as well as possible injuries to himself and the student. He had little time to make a decision to abort or carry on and he certainly made the right one. Even one circuit might have resulted in a serious fire. Flight Comment is pleased to include this pilot in the list of "Good Shows".

UPSIDE DOWN AT ZERO FEET

Snow plowing had been in progress twelve hours before flight time but considerable drifting from a strong wind retarded clearance. Finally, the north half of the runway (for the full length) was reasonably clear except for windrows of snow. It was decided that this would not seriously hamper takeoff and two sections of CF101Bs were cleared to go. It was hoped that the runway could be entirely cleared by the time the aircraft returned. However, by the time the first section was on its way back, there was still a ridge of compacted snow about 18 inches high, six to eight feet wide, down the entire length of the runway just south of the centre line. The north side was reasonably clear, but covered with loose snow.

Luckily the first two pilots landed without mishap but the leader experienced a bad skid which he was only just able to control. He advised the tower of the snow ridge with the comment "Just about bought the farm". In spite of this, no action was taken to close the airfield and the second section was not even warned of this extremely hazardous condition.

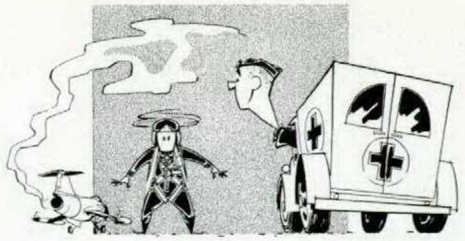
The leader of the next section executed a GC1 - GCA to runway 09. With just under 6000 pounds of fuel, he calculated his approach speed to be 190K and touchdown speed 170K. The aircraft broke out of cloud just after commencing final descent at six miles. The pilot could not distinguish the runway ahead due to a white-out condition. At about two and a half miles the runway became visible and the pilot observed that the north side appeared reasonably clear but was snow covered and that the south side had not been plowed. The aircraft touched down with 4800 pounds of fuel at 170K on the north side of the runway. The pilot immediately deployed the drag chute and the aircraft began to "weather-cock" into the 20 MPH crosswind which induced a skid to the right towards the centre of the runway. He was unable to control the skid and jettisoned the drag chute in an attempt to correct the swing. He then lowered the nosewheel to the runway and tried to control the aircraft with nosewheel steering. However, it was to no avail and the aircraft continued skidding sideways until the right main wheel contacted the snow ridge.

The ridge of snow, acting with considerable force on the right wheel, caused the aircraft to swing around sharply to the right so that the aircraft now began skidding towards the side of the runway, left wing first. The pilot flamed out the engines but could do nothing to control the aircraft. The extreme side loads broke off the nosewheel and then the left main wheel so that the port wing dug into the snow. This caused the aircraft to flip on its back in a five foot snow bank on the south side of the runway. The navigator noticed the airspeed as 125 - 135K. The momentum carried the aircraft on its back 150 feet before it finally came to rest, 3300 feet from touchdown.

The pilot and navigator found themselves upside down, uninjured, still strapped in their seats and in total darkness. The cockpit was buried completely in snow but the windscreen and canopy were still intact. The navigator, had the presence of mind to set his stop watch when they first came to rest. It took exactly 5-1/2 minutes for the crash crew to reach the aircraft and start digging in the snow. They broke the canopy with axes and in another five minutes had both the pilot and navigator safely out. The speed and efficiency with which the crash crew worked is indeed commendable.

This rather spectacular accident was assessed "Ground - Air Traffic Control". There was no element of pilot error because the pilot had not been warned of the runway conditions and once the swing started, there was absolutely nothing he could have done to control it. On the other hand, Air Traffic Control personnel who were continually monitoring the snow removal operation were well aware of the runway condition and should have declared the runway unserviceable.

Now that winter is nearly upon us again this accident reminds us of the extra caution we must take, both aircrew and groundcrew. Supervisors must also exercise precise judgement when ordering aircraft to fly from a runway which is in less than ideal condition.



NEAR MISS

EMERGENCY?

A Yukon was descending to its home base at the completion of a trans-atlantic flight when the captain noticed that the elevator control was becoming progressively stiffer until finally, at 2000 feet, it locked solid. He could control the aircraft using elevator trim but the response, of course, was much slower. No matter how you look at it, this is surely an emergency; especially when the aircraft is a big expensive one like a Yukon and carrying a crew and many passengers. The captain apparently didn't seem to think so and without telling anyone of his problem decided to land using trim and power.

Fortunately, the landing turned out OK, but we think he took quite a chance. There is a strong possibility that something could have upset the final approach so that the trim would not have given sufficient or quick enough elevator response to prevent a fatal accident. The Yukon has free-floating controls, and therefore an artificial feel system is incorporated. However if this system should fail manual can be selected so that control is not lost. In this case, ice in the artificial feel system caused the apparent locking of the elevators and so if this had resulted in a fatal crash, the most diligent AIB work would probably never have discovered the cause.

As this incident occurred near home base it is most difficult to understand why the captain did not declare an emergency and request technical advice through the tower. Surely, after a consultation, the aircraft would have been landed with the controls in manual and therefore no unnecessary risk.

This incident reminds us vividly of our bird called, "Writeoffus Obscurus" in the Mar-Apr 1961 issue of Flight Comment. If you've got a problem, let somebody know about it.

The history of aircraft accident responsibility has been a cyclic thing wherein one always finds himself in the position of "catching up" to problem sources as reflected by increases in accident rate or severity. During early aircraft history the first solution was that of grounding early flying machines in periods of severe weather in recognition of their fragile structure. As man increasingly demanded all-weather flight and added requirements for mail transport changed the picture, we found accidents prevented by strengthening of supports, improvements of fabrics and power plant reliability plus experimentation with new wing configuration and load factors. The emphasis was upon making the aircraft safe.

ACCIDENTS AND WEATHER

RICHARD TRUMBELL
AEROSPACE MEDICINE

This was followed by a period which introduced a new term "pilot error," as engineers were convinced that their contribution had been adequate. Unfortunately, the term "pilot error" actually enjoyed a period of acceptance as a "cause" for accidents and little was done to search beyond this point. Then came attention to the internal environment of the cockpit, the interface between the aircraft and pilot. This was the era of display-control relationships and analyses of eye movements for instrument location. Some major questions were: What instruments were watched and for how long? Where should they be placed for ready reference? The location of controls and shapes of handles concerned us next as we discovered by accidents that learning did not transition as rapidly as man changed aircraft types. Simulators and procedural trainers became a dominant part of training in this period as our vocabulary grew to include such things as learning, set and transfer of training. For the first time we were dealing with psychological needs without the tie to instruments.

Later, then, our technology raised both ceiling and speed and man received consideration for his physiological needs in order to help him keep up with those advances and to decrease "pilot error" accidents which now resulted from "g" excesses and O_2 deficiencies. The flight surgeon came into his own when the medical selection, maintenance and grounding of pilots placed this emphasis upon physiological factors. He found a new world to explore in low pressure chambers, centrifuges and pressure suits. The pace was accelerating, and keeping man in the system, as error-free as he could be, was a real challenge. This became the age of exoskeletons for man, the age of supportive systems. It introduced a delicate balance wherein the support system, itself, now could produce its own potential sources of accident in delayed response time, occupation with controls, glare and limited mobility.

However, the pilot still had accidents which led investigators back to displays with questions of "what" to display and "why" in place of the earlier "where" and "how". As a result, misread displays were changed and integrated displays appeared. Today the pilot has such displays, power boosted systems, a relatively unobstructed view, automatic pressure suits and ejection equipment that works even on the ground. Those contributing to the safety and comfort of his world have done their job well yet he still has accidents indisputably due to "pilot error". For the first time, one must face the fact that man can be too protected and too comfortable - a position one never would have considered ten years ago. Once again, one must concentrate upon psychological needs and seek their contributions to a new category of accidents.

The Navy Safety Center recently inaugurated a new technique for analyzing accidents using the verbal labels of Judgment, Attention and Memory - the JAM factors. There is evidence that such analyses can lead to better suggestions for improving the situation and reducing accidents. This can be done if the JAM factors do not become another, slightly amplified, substitute for "pilot error".

In early discussions of this concept, the comment was made that some of the accidents had happened in "perfect flying weather". It was stated in such a way as to imply that there was no reason for an accident under such conditions. The thesis of this paper is that approaches such as represented by the JAM factors will be most useful it one recongizes that the total situation must be analyzed from the needs of the pilot and, as paradoxical as it may seem, it now appears that he can have it too good.

Let us start with this "perfect flying weather". How would you define it? As is usual, the speaker in the above instance was describing a day for golf. The system of which he was speaking, however, had three "perfect" weathers, one for aerodynamics, one for the power plant and one for the pilot. The "standard day" for peak performance of the jet engine is of 59°F, 29.92" atmospheric pressure and relative humidity of 30 per cent. This is "peak" performance because deterioration sets in gradually as temperature or humidity alter until really poor performance is experienced in the extremes. The statement about a "standard day" goes on to say that within most military requirements, the engine automatically senses and compensates.

It is impossible here to provide even a rough parallel of the standard day for man; but he, too, degrades in extremes and automatically senses and compensates within most requirements. He cannot compensate, however, if he does not sense. It is proposed that the weather to which the above speaker referred, good golf weather, will contribute towards accidents of a certain type because it induces a decrease in a pilot's level of sensing.

Recently, there has been increased concern over night landing accidents, with emphasis upon the scarcity of cues or information for the pilot. Vinacke, Clark, Graybiel and others have called attention to the vertigo or autokinetic illusion potential of stimulus-poor environments. It is time to recognize that "stimulus-poor" applies primarily to the perceived environment of the pilot and not to the objective or physical environment evident to others investigating accidents. Pre-occupation, fatigue and various aspects of anticipatory behaviour all serve to reduce the functional cues available. Research has recognized the pre-occupation and fatigue aspects.

We now know that fatigue can influence all three of the JAM factors. It can narrow the range of stimuli or field of concentration as well as distort the perception of those things attended. It is the role of anticipatory behavior, a behavior especially likely under conditions such as those we mention - perfect weather - that has relevance to the JAM concept.

To keep man alert, there has to be a change in his stimulus environment. Psychologists have demonstrated this time and again in monitoring tasks. Signals coming either very infrequently or with steady uniformity are the first to result in decreased attention. Many neurological studies contribute to this, in associating EEG with stimulation. It is evident that some inputs are required whether one considers daily effects or the more exotic evidence from sensory deprivation studies. The point is that there are ways in which man can be oblivious to these inputs even though they objectively exist. Anticipatory behavior is one. Many British studies have concerned themselves with this behavior. An individual can anticipate when a pip on a radar scope will intersect a certain track or the perimeter of the scope and much combat tactical control can depend upon the accuracy of this capability. There are great individual differences in this ability. But let us come closer to the reader's experiences.

Let us take an intersection where you are driving car A and your "opponent," another driver is driving car B (coming from your side).

You will perform an amazing number of calculations in the next few seconds. You may perceive:

- relative closing rates,
- your speed relative to the speed limit,
- the condition of the road,
- other traffic in the vicinity,
- additional inputs, depending upon car occupancy, known conditions of your accelerating and decelerating capability, et cetera.

At some point you will decide that you can beat him across the intersection. You will have made an anticipatory judgment. You will have participated in a daily risk-taking situation. This is where the relevant story begins. At this point, a large number of you will cease perceiving, cease checking on whether your original estimate or anticipation was accurate. If you are tired, or occupied in conversation this is more apt to be so. You will continue to cross the intersection on the information basis available at this last point of reference - and you just might make it.

Let us change the scene now by other variables. What are some of the conditions that could degrade this situation and make you continue your input right up to the intersection?

- You are a new driver.
- You have a new car.
- You are in strange territory.
- Something is wrong with your car.
- The road is wet or icy.
- The visibility is poor.
- The other car is a fire engine, ambulance or police car.

One can add other variables from his own experience. It can be established that reduction of attention and loss of judgment were related to the fact that you were driving the same old car, over the same old route, under "ideal weather conditions".

In the first instance, accidents will result when your estimates or anticipations are faulty, when those things you expected to hold constant vary, or when you failed to take a variable into consideration. Again, two out of these three conditions will occur when fatigued, as well as when the task is too routine or things are "too good" for the driver.

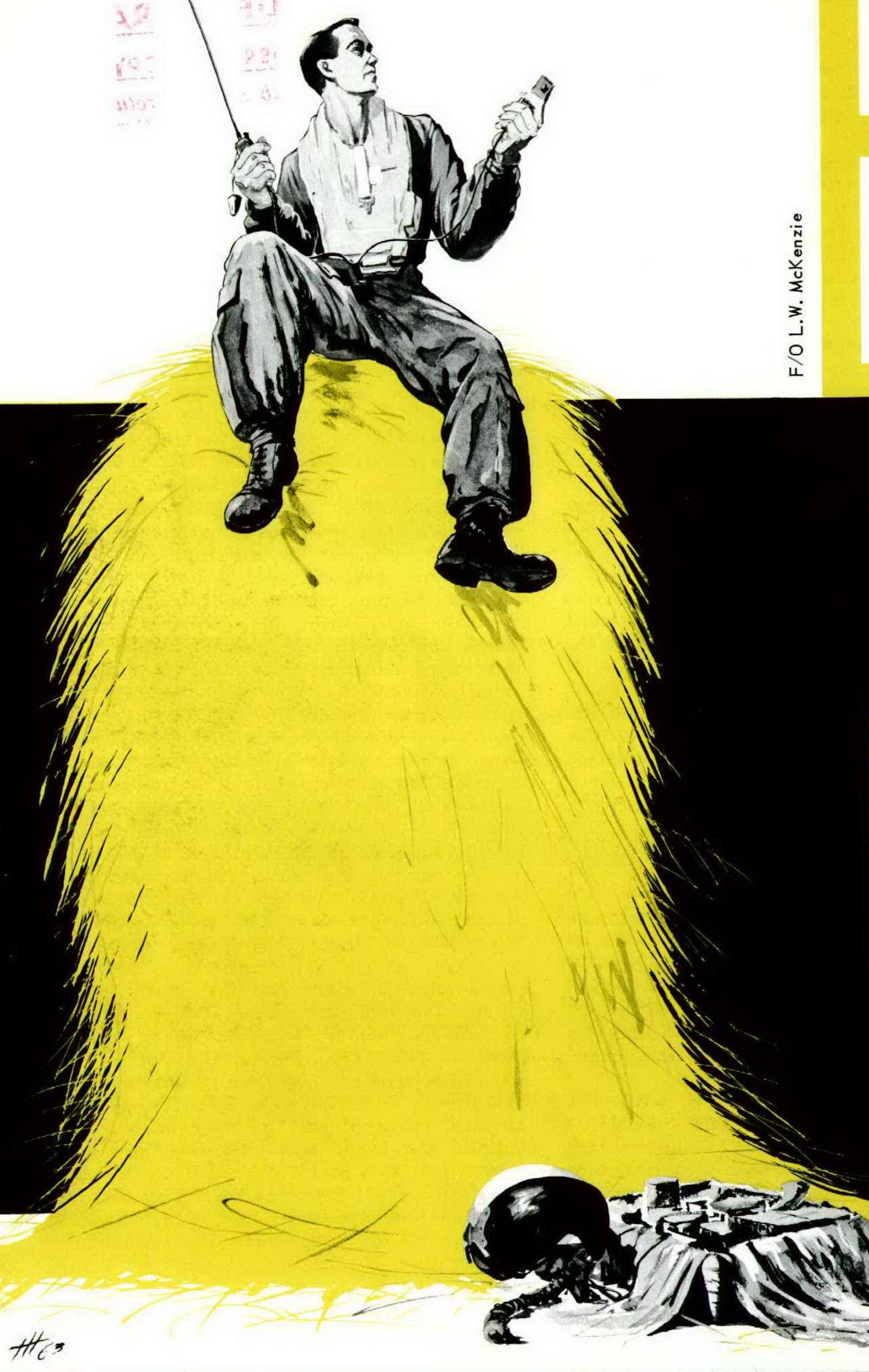
The extrapolation to aviation is obvious. The anticpated "cut" in landing aboard carriers is well known in propeller aircraft. The "almost home" or "got it made" final section of a flight is another instance, the premature relaxing in the groove of a familiar pattern. Accidents of this type will always have an element of "I don't see how it could have happened." There will be the sudden appearance of an aircraft or other variables which must have been available to the pilot but he did not actively attend to it. He already had set his course, anticipated his procedure, and "tuned-out" his personal input channels. No pilot would think of turning off a radio after receiving landing instructions because he knows things may change and new instructions may come. (Accident records certainly will prove that the last statement is false, no matter how obvious it sounds.) More commonly, however, we find pilots who do just this as regards personal, psychological channels.

The neurological system requires input for proper activation. The weather, flight plan and aircraft design can be so good, so simple and undemanding of attention that misleading anticipatory behavior will result. Although this discussion has concentrated upon the weather, instruments also can contribute to this factor of premature channel closing. This is so true in shipping today that a term "radar-aided collision" has appeared. Critical analyses of aircraft accidents might find a counterpart as instruments become more sophisticated with resultant "overdependence" upon them. Of the JAM factors, then, it is believed the key will be Attention. Had this been proper, Memory could have served more faithfully and faulty Judgment would be almost improbable.

The point is that ideal weather conditions will make their own unique contribution to accidents arising from the behavior described. The pilot can have it "too good". There will be times, as odd as it may seem, when he would have survived had the weather been marginal rather than ideal. These will be literally "senseless" accidents where sensory systems have been prematurely closed. As we become more sensitive to this need for continued verification and other related behaviors, research will find the causes of JAM factors and avoid new categories for pilot error. Our next goal will be to find deliberate ways for degrading "too perfect" a situation in order to keep man alert and alive, aviations counterpart to right-hand turns on modern highways.

BAILOUT

F/O L.W. McKenzie



I was flying a T-Bird on a routine air test after a P-4 check. Takeoff was uneventful. I climbed to 30,000 feet followed by a maximum descent to 10,000 using speed brakes. 5 G was applied, and then 1 negative G in an inverted attitude. The aircraft rolled level, at which point I experienced a restricted movement of the ailerons. Hydraulic pressure was normal at 1100 psi and stable. I suspected an airlock in the hydraulic system and thought that deboosting the ailerons might remedy the situation. Aileron boost was turned off, but this made no difference. I realized it was time to declare an emergency. I reduced power to 70% for 200 kts, switched to 243 mcs and advised Gimli tower of my problem.

While waiting for information from the tower who were calling in technical help, I did some further checks. Visual inspection revealed that the ailerons were locked in the neutral position. The stick would move two inches either side of neutral but the ailerons moved only 1 to 2 degrees. It was easy to move the two inches, then controls came to a firm, solid stop. I exerted all the pressure I could on the control column, but it had no further effect on the aileron travel. I cruised at 65%, 165 knots at 10,000 feet and returned to the field. Using two degree of aileron, I could just manage a rate 1 turn without trim. I tried to lower the undercarriage by the normal system, but the main wheels remained up and the nosewheel indicated unsafe. I tried the emergency system. Hydraulic pressure increased to 1300 psi, the main undercarriage unlocked and then after a long pause locked down, but the nosewheel refused to lower.

In a few minutes, W/C Lawrence, COpsO at Gimli, came to the tower and I reviewed the situation with him by radio. He suggested that I descend below the freezing level in case moisture had been frozen in the controls. This did not work, so I climbed back to 7000 feet. A Portage aircraft which was diverted to make observations, confirmed that the main wheels were down but the nosewheel was only 45 degrees down, although not cocked. I then tried speed brakes but visual examination showed that they would not move. The hydraulic pressure remained at 1100 PSI.

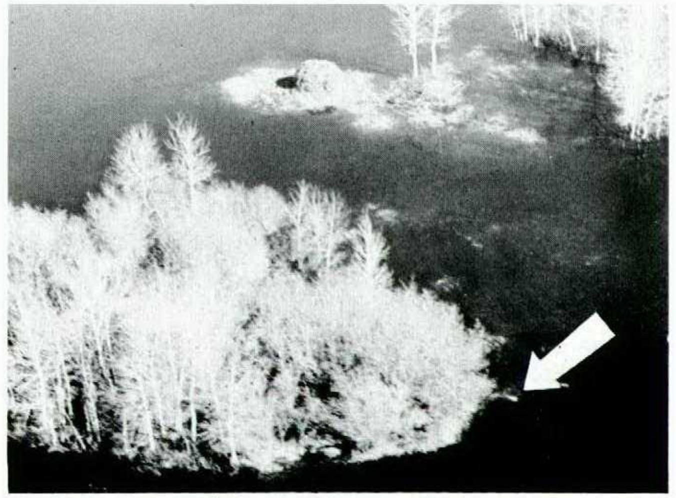
Flight Sergeant Dagert, NCO i/c Research Section, Gimli, who had been called to the tower to supply technical information, questioned me regarding the reaction of the undercarriage and the dive brakes on the normal hydraulic system. I advised him the nose gear unlocked and remained unsafe; the mains were down and locked, speedbrakes were unserviceable. He requested me to look in the boot around the base of the control column for FOD, but nothing was found. I could not check the ground test valve due to the cover over it. The barber pole was checked in the emergency position and the emergency pump was again switched on but still with no effect. The pump was turned off and the barber pole to neutral.

F/O LW McKenzie is the Unit Test Pilot at RCAF Station Gimli. He joined the RCAF in 1956 and received his wings at Gimli in March 1958. After a tour on CF-100's at Comox he was transferred to 1AFS Saskatoon as a Multi-engine Instructor, then to the Station Test Pilot duties. When Saskatoon closed he was transferred to RCAF Station Gimli, again as Station Test Pilot.

I tried to retract the undercarriage but the undercarriage selector would not move. The barber pole was returned to emergency, pump on, and I tried to snap the nosewheel into place by sharp pullups, but all to no avail.

During these operations and with interchange of conversation with technical personnel and W/C Lawrence, the possibilities of ejection were becoming greater. After all possible action suggested by technical personnel in the tower had failed to remedy the situation, it was finally decided that the odds were against trying to land. Reviewing the ejection drill from the EO with W/C Lawrence, I climbed to 10,000 feet and headed 230° for a bail-out. I stop cocked the engine, and abandoned the aircraft with 25 gallons of fuel remaining, at 130 kts, elevator trim all the way back. I went through the normal ejection procedures and everything worked correctly.

I initially experienced rapid tumbling in the seat. The tumble was so rapid that I could feel fluid in my head, something like water in the nose when swimming. The harness released but I hung on to the seat grips. My buttocks were about one foot from the seat, and I was hanging on; I realized this and released the grips, the seat parted and I went into a flat spin. I saw the seat going away and thought it was my parachute. I felt for it and was relieved to find it still there. The spin began bothering me so I put my arms and legs out and the spin decelerated with a possible slow roll thrown in. I thought the automatic feature of the chute should have worked by now, but since it hadn't I grabbed for the D ring and finally got it after four quick attempts. I felt a jolt in my neck and shoulders as the chute opened but the opening shock was not bad. (Pilots in the chase aircraft estimated there was about seven seconds from ejection to chute opening). The aircraft was still near and in a 20 degree left bank. The nose was oscillating through level to slight nose down. It did a complete circle and came straight for me. The first time, it passed not more than 100 feet over my head but luckily I was descending faster than the aircraft and although it kept circling over me, it never came closer than on that first pass. My parachute started oscillating and I was unable to do anything to control it. I decided to let well enough alone and prepared for landing.



Spot where I landed (arrow) and haystack I sat upon.

I landed on a small spot of ground surrounded by water, straight down on both feet, rolled to the right and on my back. The T-Bird was still above me and it seemed to be coming right at me. I wanted to run, but I could not release one of my seat pack straps quick enough. I was relieved when it passed overhead and crashed, about a mile or so away. I walked through water to my knees to a nearby haystack, carrying my pack and set up my SARAH beacon. Waiting for rescue, I opened a can of food and ate some candy rations while I tried to contact the circling Albatross by SARAH. I knew help was near but was a little curious as to how they would rescue me in the middle of a swamp. I wasn't getting a reply on SARAH so I descended my haystack and took off my wet boots and socks. Shortly after, two farmers arrived, after wading through water to the top of their hipwaders to get to me. We chatted and built a fire for a signal and to get warm. Soon a Dakota circled overhead and dropped a note stating an ambulance and a boat were on the way.

However, I never saw the boat. After two hours, S/L Sherwood arrived on the scene riding an old mare with no saddle. He invited me aboard, so I put on my wet boots and socks and we rode off into the night, and the water, I might add. After a mile or so through water up to the horse's stomach, we arrived at a farmhouse, where an ambulance was waiting. I arrived in the hospital four hours and forty-five minutes after bail-out with only a slightly stiff neck.

S/L Sherwood to the rescue.

I might have tried a landing using rudder for directional control if foam had been available at Gimli. But any miscalculation by myself on approach or touchdown in the crosswind which prevailed at the time with locked ailerons and a half extended nosewheel, could easily have resulted in disaster. Rudder alone might not have been sufficient to maintain level flight at landing or overshoot speed.

As it turned out, since I had to manually deploy my parachute, I lost about 2000 feet and 7 seconds. If I had had to eject at low altitude I might not have made it.

The violent tumble I experienced was found to be due to the speed of the aircraft at bail-out. A study has since been made of this, and it has been determined that the best speed to eject from a T33 under control is between 180 and 200 knots. At speeds slower than this there is forward tumbling as I had experienced plus the additional hazard that the aircraft might circle back and hit you. Speeds higher than 200 knots cause rearward tumbling.

A special investigation was also made to find the reason why my parachute automatic opening device did not work. It was determined that the internal mechanism was binding due to insufficient clearance. A special inspection was raised to check all parachutes in the Air Force and EOs were amended to specify the correct clearance.

The accident was caused by the material failure of a check valve which prevented the normal flow of the hydraulic fluid back to the header tank. This resulted in equal hydraulic pressure on either side of the aileron jacks so that they locked solid and remained locked even when the ailerons were deboosted. Also it caused the other hydraulic services to be unserviceable.

I feel very lucky to have come out of it so easily. This was primarily due to the cooperation and initiative of the tower staff at Gimli. They grasped the situation right off and kept the info coming as long as possible. Although, as it turned out, there was nothing that could have been done to remedy the situation in the air, it gave me encouragement and was a tremendous morale booster.

FROZEN DILEMMA

"I had heard that the T-bird static ports would ice up, but really hadn't given it much thought until today." The muscular dark haired pilot sipped from his freshly filled cup of coffee. "Funny, they weren't forecasting freezing rain . . . in fact, before I left the fix they gave me current weather as 2000 and four."

"We were in it solid all the way down and picked up the usual ice on the windscreen. Nothing serious . . ." He paused to drink some more coffee. "GCA picked us up and cleared us to 2500. We leveled at that altitude and at 190 knots, picked up the boards. We were getting more ice and I decided we would be better off under the clouds. I asked GCA if they could drop us down a bit. They said they could, and cleared us to 1500. At 1500 we were still in the soup and still picking up ice. GCA told us to descend to 1000 and since I had the gear down by then, I eased the stick forward and reduced power but got no indication of a descent. Nothing changed. Airspeed was steady on about 170 and the altimeter was on 1500'."

"I knew I was below 1500, but how far below? Even if I'd been expecting this to happen it would've been a shock."

"I increased power to 85% to halt the descent and the airspeed jumped to 200 knots. I used the attitude indicator to establish a climb . . . at least I hoped it would be a climb."

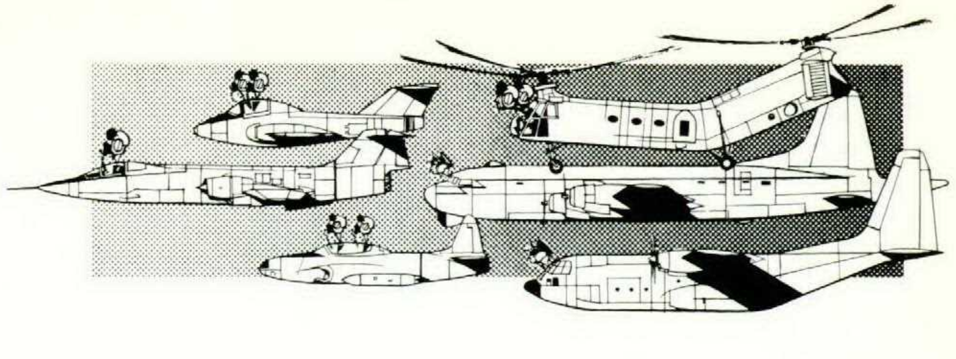
He sat on the edge of his desk and finished off his coffee before continuing. "Right then I started breaking out under the stuff so let down further. We were just barely contact, but the closer we got to the field the better the weather. It wasn't long before the airspeed returned to normal and the altimeter came down to 700 feet. From there on, it was a normal approach. Strictly, no sweat."

"Really, thinking back, we didn't have too much of a problem. We had plenty of fuel and our alternate was quite good. I could've climbed back up and gone to my alternate . . . which is what I was starting to do about the time I broke out."

"I'd say the best procedure would be to fly power settings and attitude and continue the approach if ceiling was a thousand feet or higher. If lower than that I'd go for my alternate . . . again using the attitude indicator and power settings. If in a corner I guess I'd finally break the glass on the altimeter and dump cabin pressure. The altimeter would be off and so would the airspeed . . . but given a little time and some help from GCA I know that I could determine my altitude. The airspeed, I'd want high, figuring the ice would increase stall speed and that taking the barrier would be justified under the circumstances."

He grinned and scratched his head. "You know, it wouldn't be a picnic, but by having a plan of action ready in advance and by staying cool, I think you could hack it. Were it to happen again, I'd read GCA in on my trouble early. That way they could get set up and ready to give me altitude info before I reached a normal approach distance . . . that would be better than making a completely blind let down."

TAC ATTACK



HEADS-UP

FS SD HILL

FS SD Hill was an engineer on an Argus on a Trans-Atlantic flight from Scotland to Greenwood, N.S. Altitude was 6000' in cloud, the outside temperature was -3° C and there was a light freezing precipitation. Cruising power was set at 1900 RPM, 100 TCP, and 10% lean. The aircraft had been airborne a little over ten hours; the engineer was sitting facing his panel and no engine controls were being touched or adjusted when suddenly the master motor warning light flickered and came on. RPM started rising rapidly, FS Hill moved the master lever rearward to see if engines would regain control but RPM continued to increase. Realizing the dangerous situation of overspeeding of all four engines (RPM had risen to 3600) FS Hill then closed the throttles and moved all propeller switches to fixed pitch positions. The pilot set up a shallow glide, while the engineer attempted to regain control of the propellers. By using manual decrease position he brought engine RPMs down to 2000.

At the pilot's request, the engineer confirmed that he had control of the propellers and was instructed to set power at 2000 RPM and 100 TCP on all engines. When all engines were at this speed he reset mixture controls to auto rich, and spark to retard position. Engine instrumentation, ignition analyzer were checked, engines were visually checked and everything appeared normal again. When the aircraft had regained the 500 feet it had lost, the pilot requested the engineer to reset power to 1900 RPM and 100 TCP and 10% lean. When FS Hill confirmed by further checks that all engines were completely controllable in manual, the pilot made the decision to continue flight to Greenwood.

This whole incident covered only a few seconds but the loss of all four engines was a most dangerous possibility. Considering the complete lack of warning FS Hill had, he is to be commended for his quick appraisal of the nature of the emergency and the way he gained control of the engines. He dealt with the situation in a professional manner and Flight Comment considers this action of FS Hill a good example of "Heads-UP." Knowing exactly what to do when time is so precious is the saving grace in an emergency situation.

S/L RH JANZEN

F/L DW McCUAIG F/L JR BUTEAU

An Albatross was scheduled for a return flight to Station Greenwood after having flown 43 hours in four days on SAR at Fort Chimo in temperatures ranging from -20 to -35°. The crew consisted of S/L R.H. Janzen, F/L D.W. McCuaig, and F/L J.R. Buteau.

Pre takeoff runup and aircraft procedures were carried out with engine and flight instruments operating normally. Takeoff was normal. When the aircraft had passed through 1000 feet the left propeller low oil level warning light came on. The captain gave a quick look at the engine nacelle and noticed evidence of hydraulic fluid. He then directed one of the crewmen to activate the left propeller replenishing switch and another crewman to maintain a visual watch at the left engine nacelle and advise him of developments. The warning light came on and integral oil control unit was replenished three more times during the circuit pattern.

In the meantime the captain had advised Goose Bay Radar Departure that an emergency was pending and requested a close-in GCA. Radar response was excellent. A normal power approach landing was made without further incident.

After engine shutdown, the oil leak was discovered coming from the blade root areas. A further check of the engine oil system revealed that approximately four gallons of engine oil was used during the incident.

The positive action by S/L Janzen and his crew along with the quick response by the Goose Bay GCA unit indicate "Heads-Up Flying" all 'round.

OFFICER CADET FJ JOHNSON

Officer Cadet FJ Johnson of Station Moose Jaw was signed out for a solo trip. After forty minutes of aerobatics he returned for circuits and landings. Everything was normal, until after one takeoff, at approximately 400 feet AGL, the windscreen became covered with oil.

Officer Cadet Johnson called the tower who cleared him to land on runway 13. As he turned crosswind for a low-level circuit at 500 feet he brought the power setting back to 25"MP and 1750 RPM. Just as he was opposite the button of runway 03 the engine started smoking. He turned the fuel and switches off and notified the tower he intended to land on runway 03L. He lowered flaps 15° at first, later 45° and lowered the undercarriage. Unable to see the runway clearly, he bounced, touched down on the grass, and braked to a safe stop without damage to the aircraft.

Inspection of the aircraft revealed an unserviceable front propeller seal and dome gasket, permitting oil to leak and be sprayed over the aircraft. There was no evidence of fire and Officer Cadet Johnson's action of shutting down the engine may have been questionable. However, considering his very limited flying experience and his firm belief that a fire did in fact exist, his quick thinking and actions in carrying out a "dead stick" landing on the airfield with nil damage to his aircraft are highly commendable.

Flight Comment is pleased to include this Officer Cadet in our column "Heads-Up".

F/L DLF LAMBETH

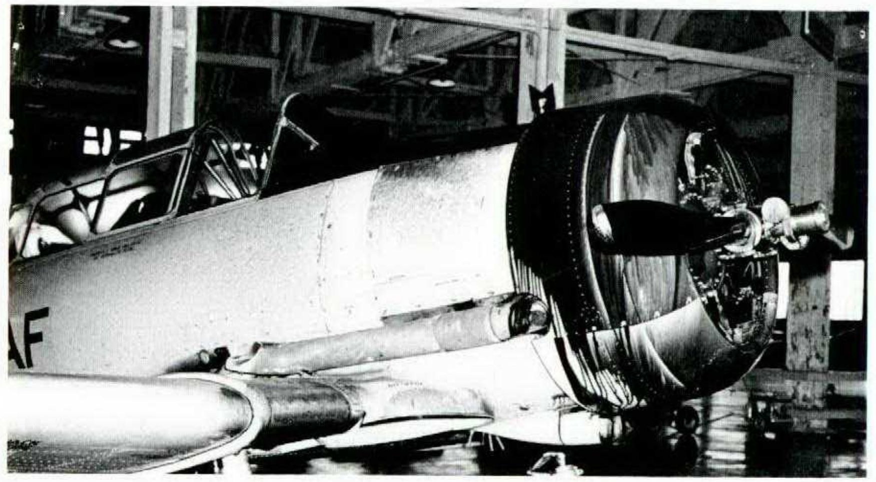
F/L DLF Lambeth was on a routine transport flight from Winnipeg to North Bay. While switching fuel tanks from auxiliary to main, the port engine RPM surged from 2050 to 2300. As the aircraft was in heavy turbulence, the captain thought perhaps the port pitch lever had been struck in the process of switching tanks. He retarded both the pitch control and throttle but this action had no effect on the RPM.

After some minutes it appeared that although the engine was running at high RPM, it was running steadily and still delivering power. F/L Lambeth decided not to feather it unless it actually tried to run away. At this time he increased the starboard RPM commensurate with the port for engine synchronization.

North Bay approach control was requested to pick up the aircraft on radar. It was subsequently brought in by GCA and landed without further incident. Prior to the actual feed-in on GCA, North Bay was asked to keep the aircraft high on the glide path so that approach would be assured in the event that the port engine had to be feathered.

Upon investigation it was found that the port constant speed unit control shaft had been sheared and this part of the shaft together with the pully and pitch change cable were found lodged between number 2 and number 3 cylinder.

F/L Lambeth handled this situation in a professional manner and is to be commended on the technique employed.



OPERATIONAL USE OF NEW MET INSTRUMENTS

BY CJ STEAD
AFHQ METEOROLOGICAL BRANCH

By the end of 1963 it is expected that most of the major airfields in Canada and the four wings in 1 Air Division will be equipped with ceilometers and transmissometers. Consequently, the hourly aviation weather reports will soon reflect ceiling and visibility values as measured by these instruments and airmen will notice a few changes.

At airfields so equipped, the ceilometer will be used for the official measurements of cloud height in the approach zone to the most commonly used instrument runway. However, the ceiling balloon which has been in use for several years will continue to be used to give supplementary values where applicable. The values from the ceilometer will appear in the main text of the hourly report and since these are measured values they will be prefixed by the letter "M". However a cloud height obtained from a ceiling projector or balloon may give a different value over a different part of the airfield. If this is the case, the information will be reported in the "remarks" section of the weather report. For example, a ceilometer measured ceiling of 500 feet in the approach zone and an observed ceiling of 300 feet over the operations building would be reported as:

M5⊕1 R-F 085/58/57←10 974 ST 10
CLD HGT 3 OVR OPS BLDG.

In visibility measurements, the reverse applies. The official visibility reading continues to be that obtained by the Met Observer from his observation site, and is recorded in the main text of the report. The visibility reading obtained from the transmissometer is known as the Runway Visual Range (RVR) and is reported in the "remarks" section with the runway number indicated. The Runway Visual Range is the visibility measured from the end of the runway in the direction of landing or takeoff.

The RVR is reported whenever the "prevailing visibility" is less than two miles. The RVR figure indicates the runway visibility in hundreds of feet between a minimum of 1000 feet and maximum of 6000 feet. If the visibility is less than 1000 feet, 10- is used and if more than 6000 feet, 60+ is used. If the RVR is variable the figure is followed by the letter "V". For example:

R27VR16	denotes visual range on 27 is 1600'
R10VR60+	denotes visual range on 10 exceeds 6000'
R06VR10-	denotes visual range on 06 is less than 1000'
R10VR28V	denotes visual range on 10 is 2800' and variable.

RVRNO is used when the transmissometer is inoperative and the prevailing visibility is less than two miles, unless and until the interruption of service is reported by NOTAM.

There is no doubt that the ceilometer measurements and RVR readings are extremely useful to pilots and forecasters alike, in cases of low ceiling and poor visibility conditions. It is not surprising, therefore, that questions are being asked regarding the significance of this equipment from the standpoint of landing and takeoff limits. The answer is not an easy one. One reason is that the ceilometer and transmissometer installations in Canada are presently located to serve only one runway, which may not be the only one used under marginal weather conditions. However, in due course the successful experience in the use of ceilometers and transmissometers at airfields will undoubtedly be reflected in the policy governing landing and takeoff limits.

Today the "ultimate" in the reporting of weather for safe and reliable landing operations is the provision of slant range visibility at the approach end of the runway. A satisfactory method of measuring this parameter is yet to be devised. In the meantime, the combination of ceiling and visibility measurements in the area of most importance to landing and takeoff operations will serve as a useful substitute.

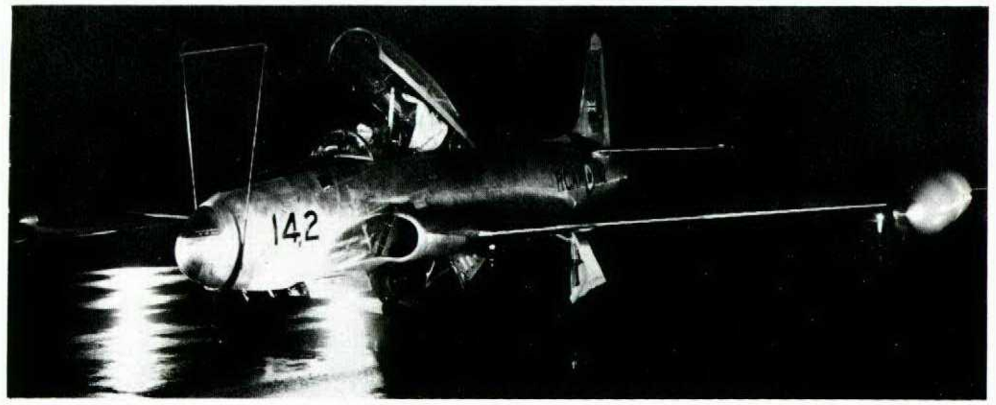
ARRIVALS and DEPARTURES

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

CALAMITY OF ERRORS

The pilot of a T33 requisitioned 493 gallons of fuel on his turnaround at Ottawa. It was his intention to stop over at St Hubert on his return flight to Chatham and more fuel would have made his aircraft too heavy for landing on arrival ȧt St Hubert. A check at the Met Office indicated that the weather was unsuitable for landing at St Hubert so he decided to go directly to Chatham. The Chatham weather was somewhat marginal but above IFR limits. Summerside was satisfactory as an alternate according to the Ottawa forecast but the Halifax forecast indicated that it might go below alternate limits. In spite of this change in flight plan and the marginal weather in the Maritimes he decided to proceed without taking on more fuel. He was legal according to the requirements for IFR flight specified in CAP 100.

The flight proceeded normally and the pilot PXd to Chatham by Fredericton at 34 with a Chatham estimate of 46. Chatham acknowledged and cleared him for a GCA surveillance approach to runway 27, which had limits of 400 and 1. The weather at this time was given as 500 feet overcast and 2 miles. At 40, Chatham issued a special weather observation of 100 feet broken, 500 feet overcast, two miles in snow grains and fog. This was passed to the pilot who said that he would do a precision GCA to runway 09 which had limits of 200 and 1/2. GCA picked him up outbound at 44 and although they gave the weather again as 100 feet broken the pilot did not recall receiving it.



On the first approach, the pilot picked up the approach lights at 1/2 mile but was high on the glide path and to the left. He elected to go around. The tower requested him to divert to his alternate but by this time he was comitted. With only 80 gallons remaining he either had to land at Chatham or eject.

On the second approach he again spotted the approach lights at 1/2 mile and was advised that he was a bit low. It was dark and a misty windscreen made it hard to see. He had been advised to land 1500 feet down the runway because of the barrier, so he added power. Finally, when over the runway, he forced the T33 on at too high an airspeed, got into a porpoise and broke off the nose gear, causing major damage to the aircraft. The pilot was no doubt under stress causing him to be over anxious in his desire to get his aircraft on the ground.

This is a good example of a series of events culminating in disaster. In the first place, the pilot should have acquired a full load of fuel when he decided to change his flight plan. There is nothing more useless to an aircraft in flight than fuel still in the bowser. Secondly, when he learned of the deteriorating weather (in fact below limits), he should have proceeded to his alternate. It was foolhardy to letdown under these conditions and thereby positively comitting himself. And finally there is no excuse for forcing the aircraft on the runway at a speed that will make it porpoise. The requirement to land past the barrier could have legitimately been ignored under these conditions.

BLAST OFF

An Officer Cadet had completed a formation solo trip in a T33, and was taxiing back to the ramp following another aircraft. The marshaller had signalled him to position next to an aircraft already parked. The cadet disregarded the order and tried to park in another space. Confusion followed and having cocked the nosewheel, he applied power to uncock it. Unfortunately, he did not look fore and aft to check if anyone was near, consequently as the marshaller went around the port tip tank to check clearance for other incoming T-birds, he was knocked off his feet and thrown into the air, by the jet blast.

It is quite possible this cadet will remember for a long time, the effect of his actions.

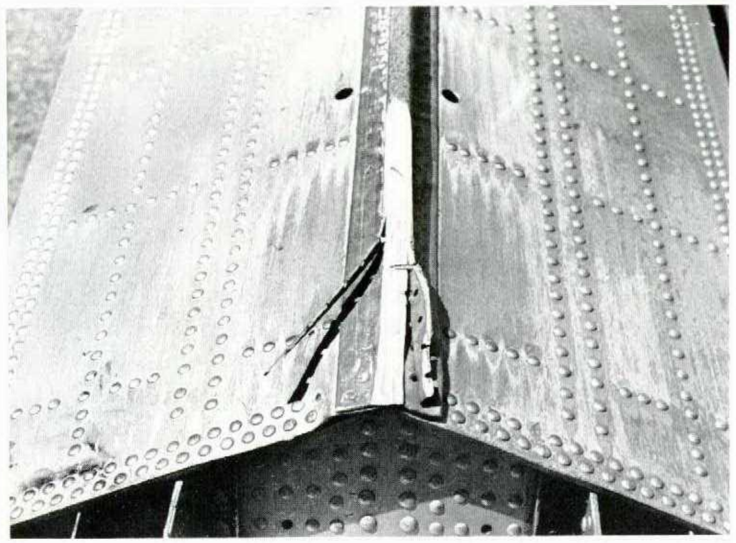
KEEL HAULLED

A student pilot, with an instructor co-pilot, was practising circuits and landings in an Albatross. After a normal takeoff the instructor simulated the loss of the port engine at 500 feet above ground. The student carried out the emergency checks rapidly and accurately and commenced a single engine circuit for landing. On the downwind leg the instructor called for pre-landing check, advising the student to leave the undercarriage retracted until a more favourable position in the circuit was reached.

Turning onto base leg the student selected 15° of flap, but the instructor reselected flaps up and reminded the student that flap was not to be used. Whereupon, the student distracted by this information forgot to lower the undercarriage and call for a final landing check - although the tower had called out "check gear down and locked" and a response had been made.

As the student pilot was actually rounding out for landing, the crewman called out over the intercom that the undercarriage was retracted. The instructor then advanced full power and assumed control by easing back on the control column. His action was too late as the aircraft hit the runway damaging the false keel. Overshoot was then carried out with a subsequent normal landing.

The accident was assessed "Aircrew Carelessness" as both pilots neglected cockpit routine. The captain was aware that final pre-landing check was missed but did not check the items in this check.



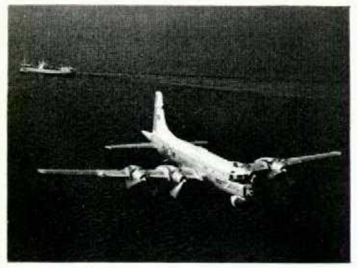
FIRE IN THE HOLE

An airman was removing the heater fuel pump from the hydraulic compartment (commonly known as the "hell-hole") of a North Star. He interrupted his work for a coffee break and during the interval an explosive mixture of fumes and air collected in the compartment. When he returned, as he touched the hatch frame, he was greeted with a small explosion, and flames immediately filled the compartment. He yelled "fire", grabbed a CO2 fire extinguisher, and quickly put out the fire.

Although it could not be positively established why the fumes ignited, the most plausible explanation is that a static charge between the airmen's body and the aircraft made a spark sufficiently large to ignite the highly inflammable fuel-air mixture. The airman did not recall feeling the "jolt" that usually accompanies a static discharge from the body but this may have been due to the fact that he was wearing a ring on the hand that first touched the aircraft.

This airman was at fault initially for allowing the highly inflammable fuel-air mixture to accumulate. However, his quick action in extinguishing the fire certainly prevented very extensive damage to the aircraft and perhaps even the loss of the aircraft and the hangar as well.

This accident serves as a reminder to us of the dangers of static electricity when working near inflammable materials. It also points up the need for venting enclosed compartments during maintenance.



CHOCK ONE UP

An Argus was diverted from its home base after a maritime patrol. The captain landed and parked on a bit of an incline and put on the parking brakes. The transient personnel at the station placed two chocks, one in front of the port bogey and one behind the starboard and departed without providing any further assistance. After the aircraft had been parked for about forty minutes, its brake pressure released through a faulty maxaret. The aircraft rolled back, breaking the fuel connecting line on the adaptor and fracturing the connection to the manifold.

Although there was a material failure, the captain of the aircraft is to be blamed for this accident. He didn't ensure that proper chocks were being used; also he left the brakes on, in contravention of orders.

A Flight Safety Bulletin has been issued on this accident for dissemination to all squadron pilots and ground crewmen.

Letters to and from the Editor are not official RCAF correspondence, and need not be directed through official channels. Unless otherwise stated, statements in letters and replies should not be construed as regulations, orders or directives.

Dear Editor

Those of us who are stationed at 1102 TSD, Canadair, had an early opportunity to see the remarkable photograph of the CF104 test pilot taking the slow way down as shown on page 6 of your May-Jun issue. An immediate reaction was to engage in a "Caption Contest" and samples ran the gamut from "Damn! - dropped my briefcase" to "Hope there's a bus soon."

One point not apparent at first casual glance is the fact that the photo shows all components of the seat pack in order. The container itself is just entering the ditch: above it, and still connected by the lanyard are the pack of goodies, the dinghy, which is partially inflated, the metal radar reflecting plate and one serviceable pilot.

G/C GW Reid
Detachment Commander
1102 TSD

Dear Sir:

Where, oh where, has Flip Phingerin gone? I have thumbed through recent copies of Flight Comment to find some news of this interesting and intrepid character, but alas, nothing!

I was looking forward to reading of the exploits of this not-too-distant cousin of the late P. O. Prune. I'm sure his light-hearted approach would emphasize many unsafe conditions and questionable practices.

Over the years I have been a keen observer of this fearless chap and a collector of his brilliant deductions. Below is a list of some of his more or less illuminating observations which could only be described as Flip Phingerisms. Perhaps the readers of Flight Comment would find them enlightening - more or less.

F/L HA Fawcett
AFHQ/DFS

Dear Sir:

Although temporarily employed on a ground tour, I am still an avid reader of Flight Comment, and am surprised at the number of "finger trouble" accidents reported, particularly those in "from AIB files" and "Arrivals & Departures", in your July-August issue. I have a suggestion which I am sure would cut these type of accidents down to nil in very short order, that is transfer guilty parties to a tour in Ground Environment. I can guarantee you that after such a tour any pilot will feel himself so lucky to be back on flying duties that his flying habits are bound to improve. Another incidental advantage is that some new blood in the system may expedite the return of some accident free pilots such as myself to flying duties.

F/L RW Ainsley
SGTO Stn St Sylvestre PQ

Editor's Note:

What happened to those tip tanks on a T33 flight back in Dec '53. —Ed.

"A fatal accident could kill you", said Flip gravely.
"The airframe isn't bent", said Flip incidentally.
"The brakes seized", said Flip tirelessly.
"Lightning strikes can be minimized", insisted Flip ex-statically.
"Snowbanks don't bother these aircraft", insisted Flip flippantly.
"That firewarning is probably false" protested Flip hottily.
"I'm a bird", chirped Flip flightily.
"If the barn hadn't been there I wouldn't have hit it", groaned Flip resignedly.
"I never worry about hydraulicing", countered Flip crankily.
"Another drink will improve my judgement", leered Flip gin-gerly.
"I enjoy making holes in the blue", Flip droned boringly.
"I thought the runway was longer", said Flip arrestingly.
"I'll bet I can fly under that bridge", harped Flip.
"Those aren't fuel fumes", Flip explained explosively.
"Bold pilots never die", countered Flip crypt-ically.
"I rounded out too high", said Flip loftily.
"I can't read this code", said Flip re-morse-fully.
"I didn't think you were closing the canopy", moaned Flip offhandedly.
"Surface-lock checks don't bother me", sobbed Flip uncontrollably.
"It won't cost much to fix this aircraft", insisted Flip brokenly.

Unfortunately F/O Flip Phingerin has been transferred but we hope to hear from him time to time. Perhaps other readers know of some Flip Phingerisms (Alias Tom Swifties) that they would care to send in. —Ed.

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1963

Species reported by: F/L WI GOULD, SOFS
Stn Penhold

BIRD WATCHER'S CORNER

THE RED BEAKED, YELLOW BELLIED GROUND LOOPER

This bird was prevalent throughout most of Canada, but is now rarely sighted except in Saskatchewan and Alberta. It is easily identified by its yellow plumage, and the latest reported hatchings have a brilliant red beak and silver feathers at the wingtips.
This species is usually observed when winds are light and variable, but is occasionally seen at other times. Its favourite manoeuvre is a dazzling display of pirouettes which it often terminates by perching on one leg like a crane. It has a loud, raucous call, and is usually heard long before it is seen.

CALL: DIDN'TBRAKESOONENOUGH SHOULDAUSEDPOWER SHOULDAOVERSHOT

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