RCAF FLIGHT COMMENT

JULY • AUGUST • 1964

FLIGHT COMMENT

COVER PHOTO: Five hundred knots . . . seventy five feet: this excellent photograph of a section of the flight line at Cold Lake was taken from a low flying CF104 using the vicom camera pod.

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

Flight Comment is produced by the RCAF, Directorate of Flight Safety. The contents do not necessarily reflect RCAF policy and unless otherwise stated should not be construed as regulations, orders or directives.

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

G/C AB SEARLE
DIRECTOR OF FLIGHT SAFETY

W/C D WARREN
ACCIDENT PREVENTION

W/C JT MULLEN
ACCIDENT INVESTIGATION

Articles

Features

ROYAL CANADIAN AIR FORCE
DIRECTORATE OF FLIGHT SAFETY

ROGER DUHAMEL, F.R.S.C., Queen's Printer and Controller of Stationery, Ottawa. 1964

W/C JT Mullen
Accident Investigation Branch

The Accident Investigation Branch of the Directorate of Flight Safety contributes in many ways to the over-all flight safety program, but its most effective contribution results from a determination of accident cause, and in subsequent rectification, in order to prevent recurrence.

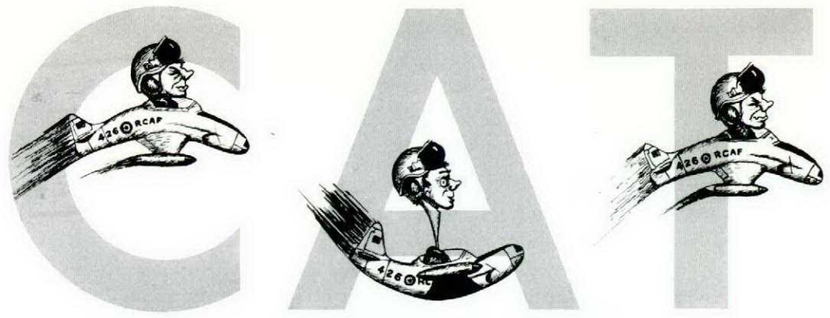
The aim of the investigator, therefore, is to resolve the accident cause as quickly as possible, so that timely corrective action may be taken. In theory this procedure bears a striking resemblance to that of "locking the barn after the horse has fled", but in practice this is fortunately not usually the case.

We should all be interested in reducing the number of major accidents, for reasons too evident to require stating again. The RCAF's safety record for 1963 does in fact reflect a slight reduction from the previous year in the number of major accidents. However, the reported number of minor accidents and incidents shows no significant change over the 1962 record. While we can agree that a reduction in major accidents is a cause for some satisfaction, the minor accident and incident picture should be of concern to every flying unit.

Our records, and those of other Air Forces, illustrate only too well that many major accidents result from a combination of events; a relatively minor malfunction coupled with one or more other errors of omission or commission. We can only hope to reduce the probability of major accidents by reducing or eliminating the minor.

And this is exactly where every flying unit can contribute more effectively to our flight safety effort. Ensure that all personnel recognize the importance to your program of reporting minor accidents and incidents; and of examining these occurrences as closely as they examine the major ones; of establishing the cause beyond reasonable doubt; of considering all possible contributing factors, and then for recommending positive and effective corrective action. Don't be satisfied with the apparent—resolve all probabilities.

A "lower score in 64" can be realized—and effective unit investigation can lead the way.



CLEAR AIR TURBULENCE

by Paul Kowal
Meteorological Officer
RCAF Station Gimli

Experience has shown that present day aircraft are liable to fly into a turbulent area irrespective of speed and cruising altitude. It makes little difference whether the plane is a slow low-level RCAF trainer like the Chipmunk or a high-speed experimental aircraft like the X15 flying at 80,000 feet. Sooner or later, most will experience the sharp, hammer-like blows of turbulence. This discussion will deal primarily with high-level turbulence (CAT) and its effects on aircraft flying at these levels.

A list of accidents attributed to turbulence reads like this: During the course of a severe turbulence condition an elderly passenger dies on a flight from Edmonton to Vancouver. A plane disintegrates over the Everglades, killing 43 passengers. A pilot loses control in turbulent air and the aircraft plummets two miles before recovery, ripping off a two-ton engine in the pull-out. Three B52s plunge to the ground due to structural failure resulting from turbulence. The USAF alone reported over 380 accidents and 5000 incidents in a single year, where turbulent weather was a contributing factor. Although the RCAF has no recorded accidents attributed to CAT, the significance of turbulence to the RCAF will depend on the aircraft being flown, the height and the mission. There is no doubt that this insidious phenomenon has grown in status from that of a nuisance 20 years ago to that of a potential killer today.

Clear air turbulence occurs when the smooth and regular air flow breaks up into irregular and chaotic eddies, much like water waves break up on a beach (Fig 1a) Also, there may be a small narrow helical or corkscrew-like flow that develops in the main air stream which results in turbulence (Fig 1b). Vertical currents of 3000-4000 ft/min and accelerations of an aircraft of four "g" are not uncommon.

CAT areas are very variable in width, length, time and severity. On the average they are 50 miles long, 10-20 miles wide, 2000-3000 feet thick, light to moderate in intensity and last for 30 minutes to two hours in time. The severity will be directly proportional to the aircraft speed; the higher the speed the more vicious the bumps. Their cause and detailed structure are still unknown. Although forecasters can easily locate likely areas for turbulence, it is still not known why it will occur with certain conditions at one time

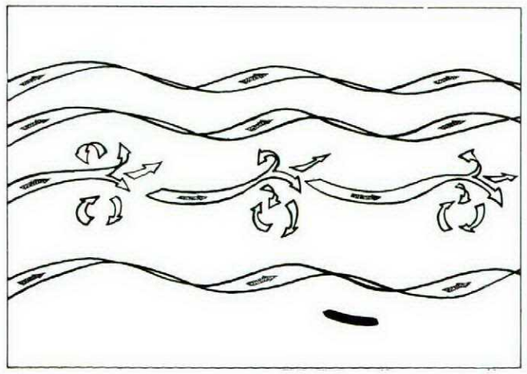


FIG 1 (a)

and place and frequently not occur at other times with similar or more favourable conditions. Studies of CAT have been difficult to carry out because of the small size of the turbulent areas in relation to the sparse network of upper air sounding stations.

The chaotic and irregular flow will cause rapid and sudden fluctuations of the aircraft speed, altitude, and angle of attack of the wing. When a pilot attempts to maintain altitude and airspeed, he may make rapid and sudden movements of the controls which could place the plane in an extreme nose-up or nose-down attitude. If at this moment a severe draft strikes the aircraft so that the vertical current direction complements the aircraft attitude, the machine will stall if it is in a nose-up attitude, or plunge into a high-speed buffet if it is in a nose-down attitude, or the pilot may lose control and find it most difficult to recover.

WHERE WILL YOU FIND IT?

Studies carried out here and in Europe, together with reports gathered from pilots to date, show that two out of three cases of turbulence are a result of wind shear (change of wind speed with horizontal or vertical distance). Since wind shear is part and parcel of the jet stream and the jet is normally found within a few thousand feet of the tropopause, the area of maximum occurrence of turbulence is delineated by these parameters. A more precise location can be made by recalling that the maximum wind shear zone associated with the jet is in the quadrant below and to the Low (cyclonic) side of the jet and a secondary maximum zone above and on the High (anti-cyclonic) side of the jet (Fig 2).

Regions free of CAT are normally found in the jet core and the quadrant below and on the high side of the jet.

Cirrus cloud formation shows a preference for the turbulent regions and could be used as an aid in identifying and locating turbulent areas.

Another meteorological feature that may have turbulence associated with it is the high-level Low or Trough, particularly if the Trough is sharp. In the case of the high-level Low the wind speed and wind shear may be quite light. However, there may be CAT areas located in regions of converging or diverging air flow (Fig 3)

Some turbulence associated with the jet stream appears to have directional qualities. While flying with or against the wind flow, pilots experience moderate to severe bumps whose intensity decreased drastically when they altered course 90 degrees (at right angles to the wind direction). The turbulence intensity reappeared just as suddenly when a change was made to the original heading.

A special case where turbulence of the severe or extreme variety is often found is that associated with standing mountain waves. When a strong wind flow, particularly a jet stream, crosses a mountain range at right angles, standing waves will form and extend for hundreds of miles downwind and well into the stratosphere (Fig 4). Extremely strong up and down drafts are associated with this type of system and great care must be exercised in planning flights in the area.

The rotor cloud at low levels and the familiar lenticular-shaped clouds aloft are signposts of danger and should be avoided.

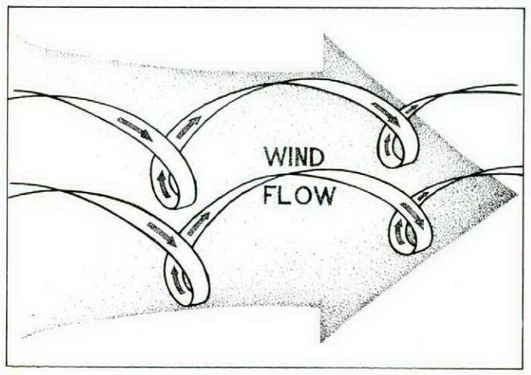


FIG 1 (b)

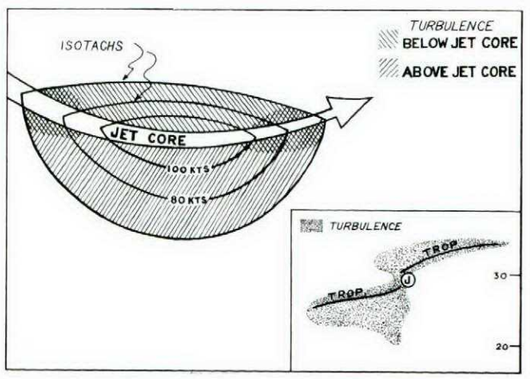


FIG 2 (a) plan view (b) cross section

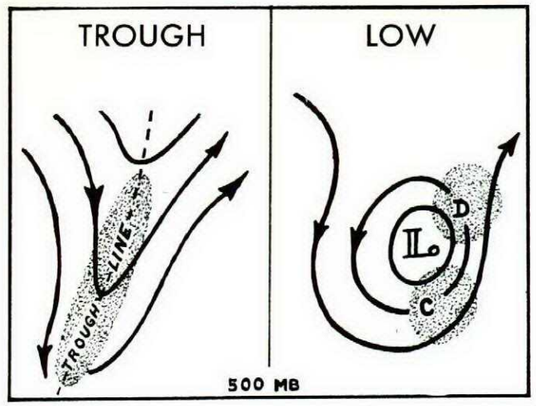


FIG 3

Vertical currents associated with standing waves have been known to manhandle even the largest and most modern aircraft, forcing them to lose or gain thousands of feet in altitude. Manipulations of the controls and power settings by the pilot will be to no avail.

WHAT TO DO?

The procedure to be followed and precautionary measures to be taken on the advent of turbulent air will depend on whether the aircraft is conventional, which normally operates at low or medium altitudes, or a high-speed jet which normally operates above 30,000 feet. FOR CONVENTIONAL AIRCRAFT - Decrease speed, change altitude - concentrate on attitude.

Conventional aircraft operating below 25,000 feet will, with rare exceptions (mountain waves), be operating below the maximum turbulent areas associated with the tropopause and the jet stream. Their cruise speed is normally well above their stall speed. Since turbulence severity increases with increasing aircraft speed, it is advisable to decrease speed to lessen the sharpness of the bumps. The amount of decrease, however, should be tempered by the thought that the more severe the turbulence the greater will be the airspeed and height variation it produces. Care should be taken that the speed is not reduced to a point where a large and complementary drop (40 kts is not uncommon), caused by a turbulent eddy, would result in a stall jeopardizing the safety of the aircraft, crew and passengers.

A change of speed brings relief by softening the severity of the bumps but a change of altitude (turbulence patches are normally only a few thousand feet thick) may take the plane out of the turbulent area altogether.

Although a change in heading may reduce the severity of the turbulence, it should be remembered that a turn will add to the already heavy "g" loadings. Should it be necessary to make a change in direction, gentle handling of the controls and a low rate of turn are in order. FOR JETS - Concentrate on attitude - don't chase height and airspeed variations.

High-speed jets cruise at speeds relatively close to their stall buffet speed. A decrease of speed to lessen the severity of turbulence and "g" loading, will result in a higher angle of attack of the wing and a decrease in stability. The sudden and large change in the angle of attack that accompanies severe turbulence may be enough to bring about stall buffet or loss of control from which recovery could be difficult. Modern airframes are

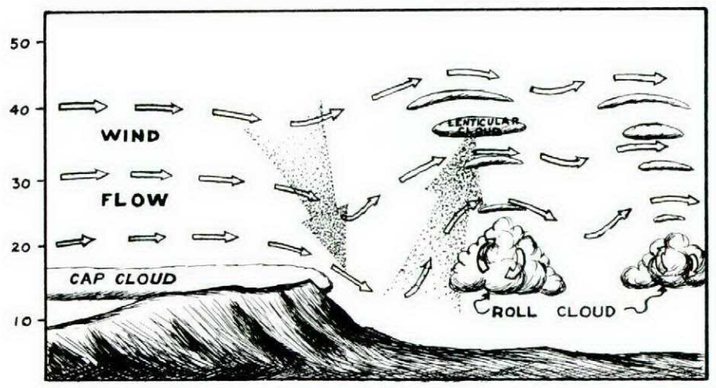


FIG 4 mountain wave

diagrams by Cpl Dean Wright, RCAF Station Gimli

constructed to exceed their design load limits. Since there is strong evidence that it is the loss of control followed by recovery attempts in severe turbulence that is the main cause of serious structural damage and aircraft disintegration, rather than the "g" loading of turbulence itself, the practice of chasing airspeed on encountering turbulence is not advisable. At the onset of turbulence the pilot should adjust his speed (or power setting) to that recommended for turbulence penetration and then his primary concern should be to maintain correct attitude by smooth manipulations of the controls. Large variations of speed and height should be disregarded as the violent shakes will make it difficult if not impossible to read the instruments and they most likely will be incorrect because of the severe vibration. Changes of altitude should only be attempted in cases of light to moderate turbulence.

MOUNTAIN WAVE—BEWARE!

Flying in a standing wave is dangerous and careful flight planning is required. Sufficient altitude must be attained before crossing the mountain to allow for the large variations in height that should be expected when the aircraft enters the standing wave. It may be necessary to fly away from one's intended heading to attain this goal if the departure aerodrome is too close to the mountain range and the climb leg of the route is under the influence of the subsiding air column associated with the standing wave (departure from Calgary with a strong westerly jet aloft). The rotor and lenticular clouds are signposts of impending turbulent flying conditions and precautionary measures are in order.

PROCEDURES IN A NUTSHELL

Obtain location of forecast turbulence areas from the weather office and flight plan accordingly.

When turbulence is encountered:

- Adjust speed to that recommended for turbulence penetration for aircraft type.
- Fly attitude by smooth and gentle manipulation of the controls. Don't chase airspeed and altitude!
- Weigh all pertinent factors carefully (eg, location of mountain wave or jet stream height and nature of mission) before making a change in altitude.

Pass report of occurrence to nearest weather office as soon as possible.

WHAT ABOUT THE FUTURE?

The heavy loss of life and aircraft attributed to CAT has airline and other interested agencies working on methods of detecting and tracking this insidious phenomenon. A number of methods have been suggested in this regard and they include the following:

A radio or optical device that will detect the discontinuities of the index of refraction that is associated with areas of turbulence.

A sophisticated instrument that will serve both as a detector of turbulence and also as an anti-collision warning device. This method would employ a narrow laser beam as an energy source and a detector sensitive to the change of backscatter that would result when the laser beam strikes turbulent air, be it CAT or the wake behind a huge aircraft.

Will future travellers get a milky-smooth ride? Very unlikely. When our scientists solve the airflow CAT problem, there will still be problems concerning cosmic showers, meteorite showers and of course, rocket landings will likely be out of this world.

Paul Kowal, a wartime navigator-bomb aimer, is a BSc graduate from the University of Manitoba. After post graduate training in meteorology he served as a met officer at Trenton, Rivers, Zweibrucken and Gimli, filling senior positions at the latter three stations. In his many and varied training and operational assignments, Mr Kowal has always been a frequent visitor to the flight line and he has accumulated hundreds of hours of flying experience, much of it on jets. This broad background of technical and practical experience is evident in his discussion of the clear air turbulence problem.

GOOD SHOW

O/C RJ ZEMEK

Officer Cadet RJ Zemek was signed out solo in a Harvard to do a number of clear hood sequences in the local area. All was normal until at 9000 ft, inverted at the top of a loop, there was an explosion and sudden loss of power. O/C Zemek completed the manoeuvre, did a "fuel-mixture-switches" check, headed for base, and advised the tower of his predicament. The engine would deliver no more than 15 inches manifold pressure without cutting out completely; he continued in a gradual descent to base from about 17 miles out. At base, O/C Zemek completed an excellent forced landing on the 3000-foot runway in use, by making a very smooth three-point touchdown, and stopping at the 2000-foot mark.

A technical investigation revealed that the exhaust rocker arm for number six cylinder had failed. What could have been a most serious accident was reduced to an incident by skill and fine airmanship. Flight Comment is pleased to award O/C Zemek a "Good Show".

F/L FP BELLIVEAU

F/L FP Belliveau, RCAF Stn Cold Lake, had just taken off for a test flight in a CF104. The takeoff was normal and at about 4000 ft above ground, as the throttle was retarded through 96%, there was a loud bang accompanied by airframe vibration and unsteady instrument readings. Loss of thrust, high EGT, and too wide-open nozzles confirmed a compressor stall. Quickly, F/L Belliveau using the prescribed procedures, flamed out the engine, cleared the stall, and obtained a successful relight. Power was left at 98% and a successful precautionary landing was made.

Later investigation revealed that a half-inch bolt had passed through the engine at some previous time. The bolt caused sufficient damage to the turbine blades so that the engine stalled as the throttle was retarded after takeoff. The swift and correct actions of F/L Belliveau under very adverse conditions saved a CF104 and for this example of professional flying, Flight Comment is pleased to award F/L Belliveau a "Good Show".

LAC DO. MAYES

LAC MO Mayes, RCAF Stn Chatham, was finishing a morning BFI on a T33. Another airman who was assisting, inadvertently pressed the airstart button. Suddenly there was a "boom" which sounded like an aircraft start. LAC Mayes immediately recognized a fuel ignition in the plenum chamber. He climbed to the cockpit, closed the high pressure cock, jumped down, grabbed a CO_2 fire extinguisher and proceeded to extinguish the fire through the ignitor plug access door. At the same time he directed the towing crew to get two other

T33s out of the way so that the burning T33 could be removed from the hangar. The fire hall was alerted to stand by and although LAC Mayes nearly had the fire out, it flamed up again. Finally the aircraft engine was rotated with the starter to blow out the fuel and the fire was completely extinguished with no damage to the aircraft.

It was later determined that the high pressure fuel cock had been left on all night and a considerable amount of fuel had pooled in the bottom of the aircraft. The prompt and efficient actions of LAC Mayes may have saved an entire hangar and several aircraft. Flight Comment is pleased to award him a "Good Show".

CAPT JR PUGH

Capt JR Pugh, CJATC Rivers, was returning to the landing pad in a CH112 helicopter after giving his student an hour instruction on pinnacle approaches, confined area work, and autorotations. The student was at the controls, when suddenly there was a loud bang, a violent shudder, and a yaw to the left. A connecting rod and piston had disintegrated, bursting a large hole in the engine casing.

Capt Pugh quickly took control, went into autorotation, and transmitted MAYDAY. The altitude was only 150 feet above the ground and thus he had no alternative but to land straight ahead. In spite of a 22 mph tailwind, the run-on was smooth and the aircraft came to rest with no further damage.

The student commented that he was indeed impressed with the need to practise autorotations and that this skilful demonstration had been a most effective climax to the instruction he had just received! Also, Flight Comment is impressed by the professional skill displayed by Capt Pugh in making an emergency landing under adverse circumstances and is pleased to include him in our "Good Show" column.

CAPT RA BURPEE

Capt RA Burpee, a USAF exchange officer at RCAF Stn Portage la Prairie, was giving a routine T33 checkout to F/O G Gelley. On the overshoot from an instrument approach a loud bang was heard accompanied by severe engine vibration. The altitude was approximately 50 ft, airspeed 140 kts, and the aircraft just passing the upwind end of the runway. At full throttle, only 85% RPM was available. A compressor stall with complete loss of thrust appeared imminent. Capt Burpee quickly took control, declared an emergency, and nursed the aircraft into a gentle climbing turn to the left aiming for a low key position from which they could either bail out or make a forced landing. At low key the engine was still running and consequently a successful landing was made.

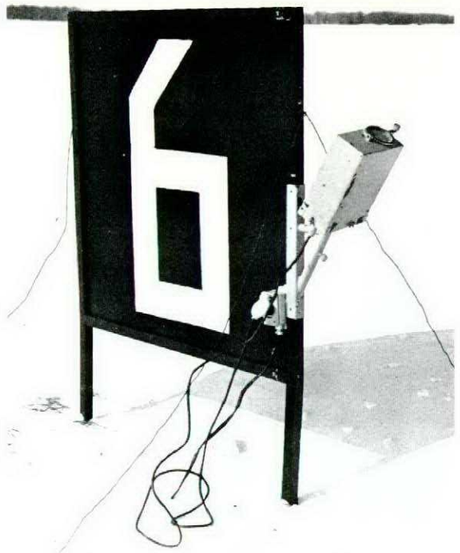
Technical investigation revealed that a piece of the rotating guide vane had broken off and gone through the engine causing considerable internal damage. For the professional manner in which Capt Burpee handled this partial engine failure at a very critical stage of flight, Flight Comment is pleased to award him a "Good Show". His quick thinking and skill is indeed commendable.

Station Portage has a flare for preventing accidents

Flight Safety is all too often just talking about flight safety. It's a pleasure therefore to see a station produce a local "fix" to a flight safety hazard. The problem at Stn Portage la Prairie was the possibility that students in the classical wheels-up configuration on final, might miss a Very flare fired from a tasker situated at the end of and between two runways. Pictured here is this station's solution to their problem - a remote control Very signal gun.

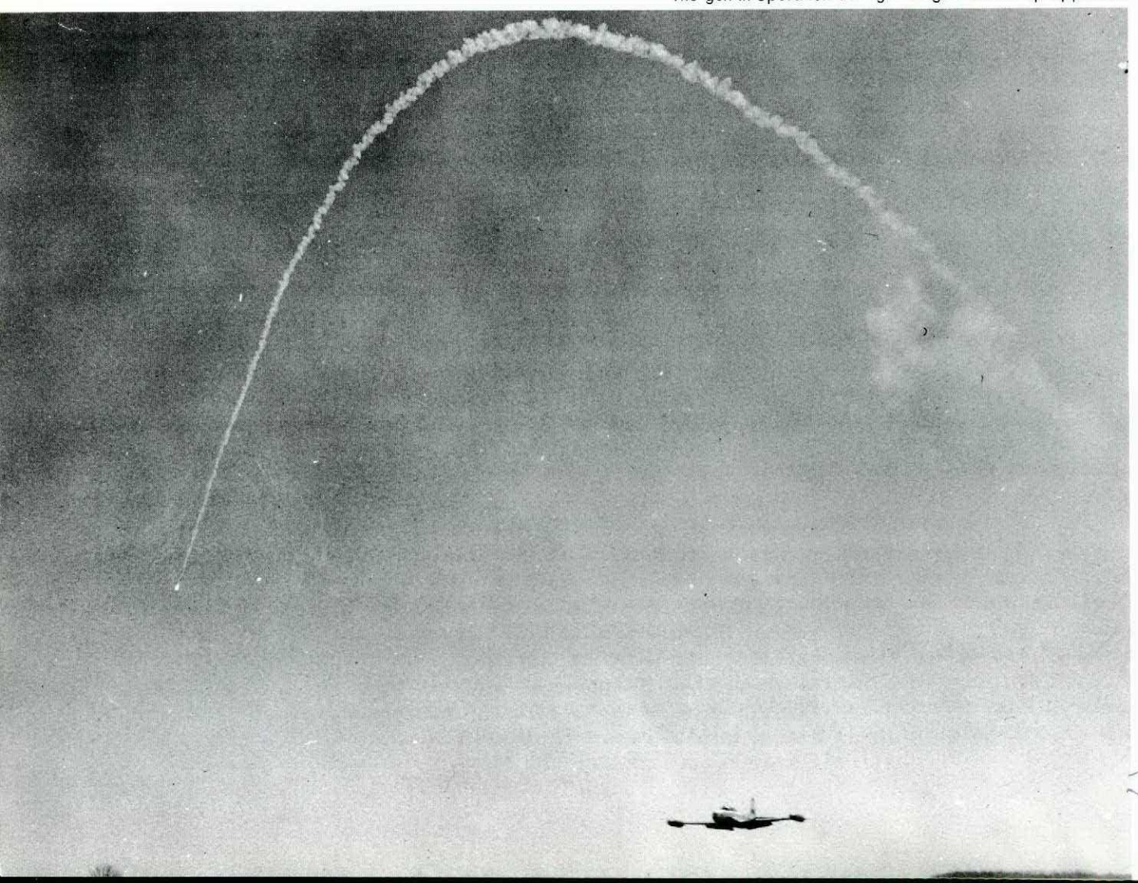
The unit itself costs $7.00 to manufacture; these were attached to a runway marker and wired, one at each end of the double runways, making four units in all. The units were wired to the tasker sites.

The station claims that already this installation has saved one crash. All those connected with the project particularly F/O J Blocha and Cpl WH Naugler who created this innovation, deserve hearty congrats; this is real flight safety in action.

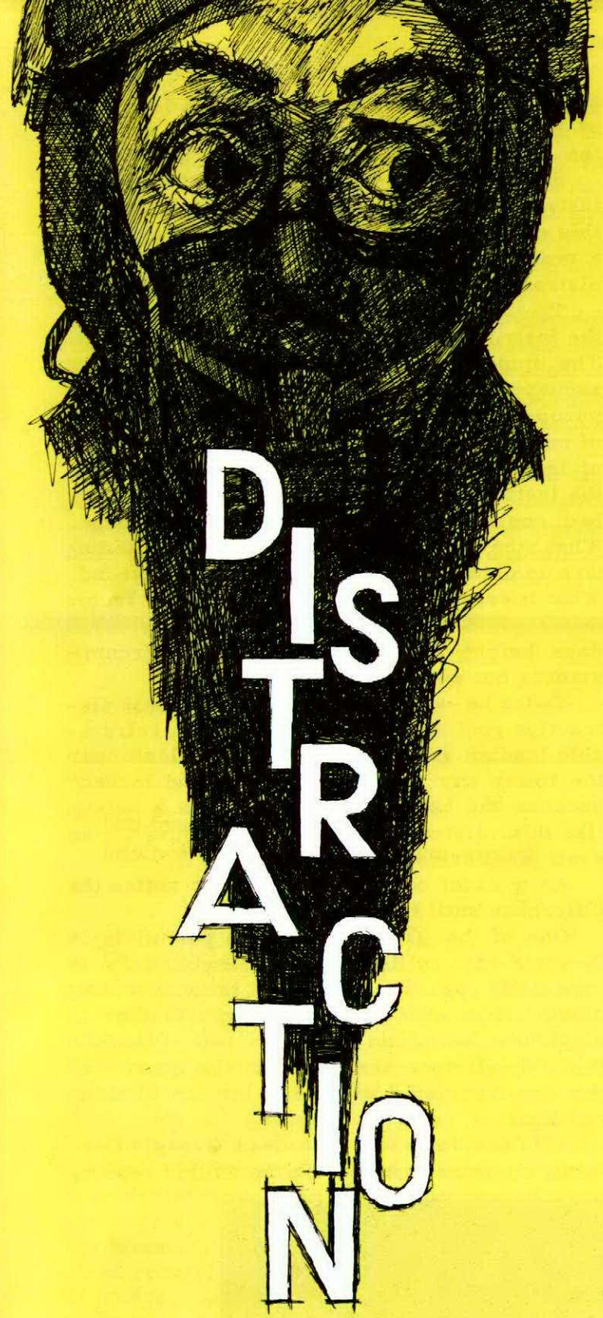


Position of gun on the runway distance marker board.

The gun in operation during a staged wheels-up approach.



JUL/AUG 64



A pilot was preparing for an afternoon local flight on a fine sunny day. An airman from maintenance asked to go along. The pilot agreed, and off they soared for a few practice "touch-and-goes".

After one landing the pilot completed the pattern for another. The landing was good, and he applied power for the go-around, pulled up the speed brakes and reached for the flap switch. At this moment the passenger asked a question about the fuel remaining. While checking his fuel gauge, the pilot unintentionally placed his hand on the gear handle and made a slight upward movement. He immediately realized his mistake and slammed the gear handle back down.

But, alas, it was too late!

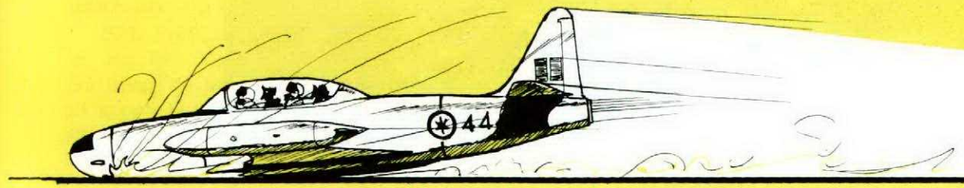
The gear folded. Nineteen hundred feet later the embarrassed pilot and his passenger crawled out.

It is hard to find a more uncomplicated accident. However, there are a couple of points worth mentioning which might save a hunk of the taxpayers' change in the future.

First of all, touch-and-goes were not strictly the "order of the day" in this type aircraft. AOIs are usually explicit for normal takeoffs and go-arounds, but in the area of touch-and-go landings they get a bit incomplete. In such areas local directives and instructions must fill the gap. The pilot did not use the proper sequence of events in making his go-around.

However, on the other side of the ledger we might slip in a word on the pilot's behalf. The word is DISTRACTION. In many public conveyances there is displayed a sign instructing passengers to refrain from talking to the driver while the vehicle is in motion. Companies have found, through the experience of many lawsuits, that driver distraction is a primary factor in accidents.

We think the "driver" of high-speed conveyances like airplanes should be accorded the



same consideration. Certainly the passenger wasn't trying to cause an accident when he made his query concerning the fuel; but during takeoff and landing is a poor time to be making conversation with a busy pilot.

In another case, a pilot took off without securing a portion of his fuel tank caps because his preflight had been interrupted by a man seeking a ride. Fortunately the pilot got the machine down before a serious out-of-balance condition created an even greater problem

But along with our objective in getting passengers to respect the pilot's duties is the entire area of distraction in general.

Sometimes it's a tough fight to get all the way around on a preflight without an interruption of some sort. Pilots must be alert for such distractions and recognize what is happening to them. When the interruption occurs, stop right there, make a mark on your checklist or mentally "mark down" the item number you are on before you walk off to check on the item you have been interrupted for. If you will simply make a mental note of what is happening so you can label it as a distraction, the chances of picking up where you left off are greatly increased.

There have been a number of unexplained accidents recently where items that should have been detected on preflight have been at fault - but the aircrew failed to find them! Since the crew members are now dead, it cannot be proven that distraction was the source of their trouble. But the fact remains, the item was wrong during pre-flight inspection, yet for some unknown reason the crew didn't find it. Was their problem distraction?

There are many types of distraction, and up to now we have discussed only the type that involves interruption of routine procedures.

Among other great offenders in aircraft accidents is the emergency type of distraction. A crew gets so involved with solving one phase of an emergency that another factor slips in the back door to bat them over the head.

Such a sequence of events overtook a C45 instructor during a night training flight. In this case, the emergency was only simulated; a real emergency would have been even more distracting!

To simulate an engine failure after takeoff the instructor retarded the starboard throttle. The student quickly went through the correct sequences and flew a single-engine circuit. He purposely left the undercarriage up until sure of making the runway. Due to the distraction of looking for another aircraft while on final the instructor failed to notice that the student had neglected to lower the undercarriage. What otherwise would have been a good landing was spoiled by a scraping and grinding sound. What is even more remarkable, this instructor was a victim of a wheels-up landing only seven days before under nearly identical circumstances but with a different student!

Twice he was the victim of the oldest distraction goof since the invention of the retractable landing gear. Possibly he couldn't hear the tower say "check gear down and locked" because the horn kept blowing. In a set-up like this, distraction becomes "fixation", - an even deadlier condition.

As a cadet once said, "I didn't notice the difference until I went to taxi in".

One of the great distraction potentials is the mid-air collision possibility. This is especially apparent at night. A crew is tooling along, when one member says, "Is that an airplane closing on us from two o'clock?" Instantly all eyes are glued on the quarter of the sky frenziedly searching for the blinking red light.

This is wrong - maybe dead wrong! Certainly someone must follow up on this report,

The oldest result of distraction since the retractable undercarriage was invented

but not to the complete disregard of all other aircraft in the sky. The man who thought he saw the intruder first knows where to look, so let him do so. But other eyes must scan the rest of the sky. Don't let concentration in the two o'clock quadrant distract you from keeping a wary eye out for the guy who may be approaching at ten.

Solving the distraction problem in aircraft accidents is not simple; but awareness is one of the first steps. Getting you to think about it enough will stimulate your memory so that you stand a better chance of recognizing distraction when it hits you.

As proof of the complexity of accidents, try to think of the ones you know about. Seldom are major accidents the result of one simple emergency. In almost every case one emergency has distracted the crew so much that when the second engine was lost they were unable to control it.

On the other hand, some of the finest "saves" of modern aircraft operation have been executed in very complicated situations when the crew remained alert to the fact that their emergency could develop further. They did not become distracted by one event.

As a crew member, say to yourself, I'll not let distraction kill me! And the mere fact that you are thinking about it will help you to recognize its disastrous effects. Distraction might even be a good word to letter in the margin of your checklist, for a word on the checklist is worth thousands before the accident board.

Adapted from COMBAT CREW

The Sherman Fairchild International Air Safety Writing Award

The staff of Flight Comment take pride in announcing that our editor, S/L WA Smith was recently honoured with a Sherman Fairchild International Air Safety Writing Award. Flight Comment was selected from material published in several parts of the world and it is the first time such an honour has come to Canada.

The awards were announced and are administered by the Flight Safety Foundation, an organization devoted to the promotion of greater air safety and supported by more than 300 corporations in the United States, Canada and other countries. The Chairman of the Board of Judges was Dr Carl W Ackerman, Dean Emeritus of the Columbia Graduate School of Journalism, a famous correspondent and foreign editor and at present a writer on international affairs.

S/L Smith attended the Awards dinner held in the Sky Club of the ultra-modern Pan Am Building in New York to receive a "Certificate of Merit" and $100 presented personally by Mr Sherman Fairchild. The certificate reads "for unusually excellent writing on air safety".

Guests at the dinner included other award winners, members of the Board of Judges, executives of the Flight Safety Foundation, prominent journalists and some diplomatic and military representatives.

In endowing the awards, Mr Fairchild, pioneer aircraft builder and "father of modern aerial photography from airplanes" noted that "constantly increasing air safety in all forms of flight is an objective which constitutes a responsibility not only in the aviation industry but of the press and the public as a whole". He emphasized that constructive writing and reporting for all media has been and will be a major influence for furthering greater air safety.

It's time for a

LONG HARD LOOK

at the TAXI TEST

There are all kinds of ways to bend an aircraft, like deliberately flying through a hailstorm in a glider or flick-rolling a Yukon - to this list add the "high speed taxi test". A pattern is emerging over the past few years of one prang after another resulting from "doing a taxi test". Aircraft from the Argus to Sabre have been involved, so it appears to be about time all units had a good hard look at their operating procedures and to reappraise just what we expect to accomplish by taxi-testing aircraft.

If this appears to be overly-obvious just look at the fuzzy thinking displayed by the supervisor(s) who dispatched a pilot to perform a high-speed taxi test on an aircraft whose brakes were reported dragging. Yes, the port brake was dragging, the pilot found, but with astonishing tenacity in following orders he did as he was told and ran the aircraft to 100 kts down the runway and brought to the dispersal an aircraft avec flaming wheel. The wheel might have disintegrated at 100 kts.... The thinking behind this event must have been: "The best way to determine if the brake is dragging is to taxi test it until it burns (or at least gets mighty hot)". Is there not a better way?

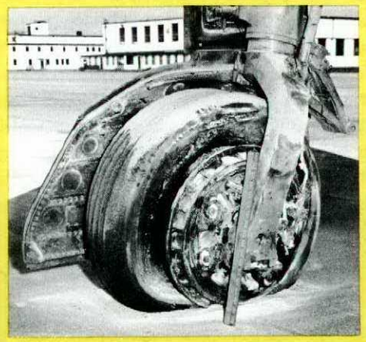
The next accident is similar - a large a[ir]craft is taxi-tested for a post-maintenance check. "Flames and smoke from your port wheels" cried the tower, "abandon aircraft". As the crew abandoned the hapless craft, three of the four tires exploded. Maintenance can take the blame for this one but so can the pilot who failed to carry out a prescribed visual inspection on the walk-around.

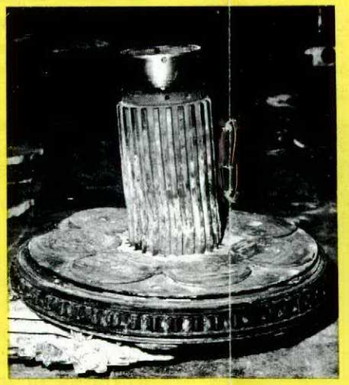
To reproduce a nosewheel shimmy the aircraft was taxi-tested down the runway at near-takeoff speed with no luck. Applying the same determination as the chap above and demonstrating that this was a "play it by ear" (ie, no briefing) exercise the pilot elected to have another go at it. The second dash confirmed the nosewheel shimmy (it was already in the L14!) but it also demonstrated to a shaken pilot that brake fade is no illusion. His close call at runway's end really began in the supervisor's office. The pilot claimed that not having worn a parachute on this ride it was difficult for him to get any feel on the brakes. Again, no procedure and no briefing for a no-purpose job which, in this case, might aptly be entitled "Setting the Wheels on Fire".

The wheels did get fired up about this one. A high-speed dash down the live was ordered to determine if the runway was too slippery for air operations. It was. The aircraft sustained extensive damage and the crew luckily escaped injury. But surely there's a better and less expensive way to find this out. Here, the basic flaw of the reasoning had gone unchallenged - or perhaps unnoticed - until its illogicality was demonstrated. Up 'til that day "the runway check" was considered acceptable practice. Presumably, the presence of the reliable — "no sweat"-type barrier — (which incidentally, failed to function that day) made the decision to go for proof positive of a slippery runway, worth the risk.

Two high-speed runs to check a reported afterburner malfunction resulted in a near hot-brake explosion; fortunately, only the tire blew. With a full fuel load (about seven tons!) and one run reaching 110 kts is it any wonder the brakes were in a dangerous condition on shut-down?

What emerges from all this is a pattern of confusion - at the supervisor's level, the pilot's level and maintenance level. Obviously, some units have no laid-down policy on what constitutes a taxi test or even why it is done. Just as obvious is the grim irony of our damaging aircraft and risking lives because "that's the way we've always done it". The time is ripe for that LONG HARD LOOK at the taxi test.





Wheels—victims of too much heat and too little care.

The braking was poor and the barrier failed to function properly—this "runway check" proved both!

Supervisor Responsibilities

Flight Safety is a constant concern in RCAF operations. Money is invested by the service to ensure that aircrew, ground support personnel and agencies associated with air operations, are fed a steady diet of slogans, pamphlets, directives and other communication devices to foster safe and thus timely fulfillment of our commitments. Unfortunately, no matter how high the aim or how active the campaign, accidents still happen; valuable aircrew and aircraft are lost.

The causes of accidents are varied, but to a large degree the human factor is a major and continuing cause. It would be possible to devote volumes to the complex psychological and physiological aspects of human behaviour, particularly as applied to humans who fly aircraft to gain their livelihood. This article is by no means trying to resolve the human factor to common denominator terms adaptable to all situations. One area will be explored, however the one which may be defined as "Supervisor's Responsibility", or perhaps more aptly "Supervisor's Integrity". As applied to the operational aircrew fields this extends into three major areas: personal welfare, professional guidance and professional assessment of aircrew.

Very little effort is needed to think of at least a few instances in which a supervisor chooses to remain remote and out of contact with the personal hopes, problems and aspirations of his personnel. Remote, in fact from an area vitally related to the effectiveness, morale and SAFETY of the flying operations under his control. A flying supervisor who makes little or no effort to know if his aircrew are faced with personal problems; who fails to recognize fatigue due to disruptions in his rest or nervousness and apprehension due to financial or other domestic problems, is in effect paving the way for an accident.

It should not be construed that this writer recommends that each flying supervisor ought to become a meddler in the home affairs of his aircrew. What is meant is, that supervisors must take sufficient discreet interest in each member of their "aircrew team" to be able to recognize when that member is troubled or upset by personal problems. The reasoning behind encouraging such interest is clear, for the instant a "team" member becomes preoccupied with personal problems to the extent that his efficiency is reduced, he is exposing himself, his crew-members and the Service to the very real possibility of an accident. The supervisor must recognize the situation; he must personally and through proper professional channels attempt to help, counsel, or remedy the problem. In effect, the "personal" touch is needed to help solve a "personal" problem.

The "Professional Guidance" aspect of a flying supervisor's responsibilities is critically important, and the reasons are self-evident - even though all too often they appear to be ignored.

No intelligent observer of an operational flying activity will deny the fact that the flying supervisor may not always be the most naturally skilful aviator. Like all humans he can make errors, and may occasionally miss a relatively easy approach or bog down with a routine navigation problem. The important fact is that the supervisor must know exactly the correct and proven procedures, tactics and techniques of his profession. He must be aware of the pitfalls, the dangerous practices and the unreliabilities inherent in his aircraft and above all else, the supervisor must ensure that his aircrew are as fully conversant with all of these items as is humanly possible. To assure such familiarity, the supervisor's continuation training program must be complete, thorough, and diligently applied. No aircrew member of the supervisor's unit should be placed in a dangerous or unduly difficult situation due to inadequate briefing, or due to the lack of a training program which could have prepared him to react in a safe, intelligent manner to an unexpected development. It would be interesting indeed to know how many accidents assessed as "aircrew error" could have been more accurately assessed as "lack of adequate supervision and training".

Closely linked to Professional Guidance is "Professional Assessment". It is here that the years of experience, the thousands of decisions, and the well-developed airmanship instincts of the flying supervisor can come to the forefront. Coupled to a proven proficiency measurement system they enable him to make a justified and accurate assessment of his aircrews' abilities and shortcomings. The assessment will of course be greatly simplified if the "Professional Guidance" program has been effective; however, a well-developed assessment system will stand alone, since it will point unequivocally at the undertrained, the incompetent and the lazy members of any aircrew team. A supervisor who chooses to dispense with an active assessment program chooses also a one-way road to an accident which could have been prevented. He deprives members of his team of the motivation and the incentive to improve and perfect their professional ability - thus further accelerating the approach of another avoidable accident or incident.

Only three areas of a flying supervisor's responsibilities have been mentioned here. The objective has been to stimulate serious contemplation of the depth and gravity of a flying supervisor's duty to his aircrews and to the Service. If the reader recognizes himself or someone he knows as a result of reading it, this will have not been written in vain, and one more step will have been taken along the difficult road to Flying Safety.

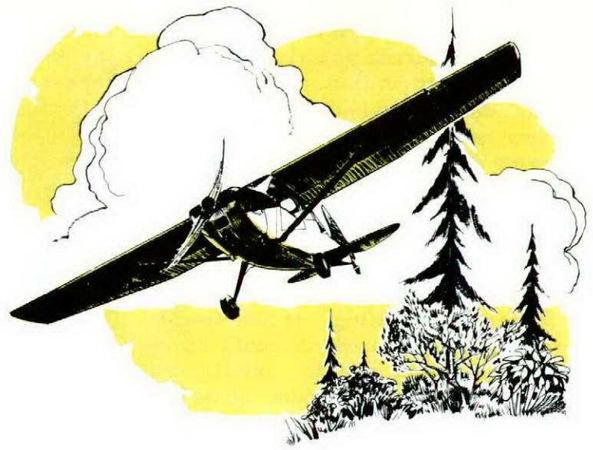
the AUTHOR

F/L WA Gryba, Air Operations Officer at the Electronic Warfare Unit, joined the RCAF in 1951 and after basic aircrew training flew with 407(M)Sqn at Comox as a Radio Officer.

In 1955 he completed the Staff Radio Officer Instructor course and was employed at ANS in Winnipeg for three years as an instructor. He then joined the Radio Navigator Standards flight at the Central Navigation School, and in 1962 was transferred to the Electronic Warfare course at Mather AFB in California.

The Stop-Smoking Pill!

A recent message from the USAF Surgeon General warned against using self-prescribed patented medicines to reduce or eliminate smoking. While these aids to will power may help you cut down to quit smoking entirely, they can also cause undesirable side effects. Many of these preparations contain a drug which acts on your nervous system much the same as nicotine. This drug produces increased tendency to hyperventilate, erratic heart beat, faintness, stomach pains, and vomiting. Check with your Flight Surgeon before you try any of these products. He is equally anxious to have you stop smoking, and will provide some sound advice which won't compromise flying safety.



PANIC POINT

"Flying is Nothing but Hours and Hours of Boredom,
Punctuated with Moments of Stark Terror"

When that moment of stark terror interrupts the routine of boredom, why are some pilots able to come through, while others seem to forget the emergency procedures that have been taught them? In an attempt to answer the question let's look at the various aspects of the problem and see if we can come up with a theory. First of all, what is fear?

Fear is an intense emotional reaction characterized by attempts to withdraw from the situation according to the Encyclopedia Americana. The encyclopedia also explains that panics are fear reactions arising when there has been no preparation for meeting the threat.

And there we have our first clue, "...no preparation for meeting the threat".

Perhaps those lucky individuals who always seem to come through in an emergency are able to see and use the preparations that have been made for meeting an emergency. Or perhaps if we carry this even further, when preparations have been made to meet an emergency, is it still an emergency?

Suppose you are flying along, enjoying the scenery. The air is calm; your engine is functioning perfectly; and below you is nothing but mile after mile of pine trees. Suddenly the engine falters a little - then goes dead.

Are you now in an emergency? Apparently you are. Down below you are trees and more trees. As far as you can see there is not a patch of cleared ground big enough to land in. And here you are with no engine to pull you in to your planned destination.

Is it really an emergency? Suddenly you remember that all you have to do is pull the throttle back a little and change to a tank with fuel in it. You see, preparations had been made for just such an occurrence. Of course, it would have been an emergency if there had not been two tanks or if you had become so excited you forgot to switch. But you did remember and you did act. So, it became just a ho-hum-switch-tanks routine.

Looking into this matter of fear and emergencies a little further, we see another clue. When the engine went dead, you were able to think out the trouble and take corrective action. Thus our second clue is in the matter of thinking during an emergency.

The pilot must know exactly what he and his equipment can do. If he tries to get more out of his airplane than was built into it he is in trouble. Therefore it is important that every pilot must have a will to learn. He must jump at the chance to learn all there is to know about the equipment that he is flying.

When confronted with an emergency situation, each individual pilot arrives at a point where reasoning will be impaired by panic.

Some aviators with extensive experience and background have accumulated knowledge that enables them to have a higher panic point. It is known that lack of familiarity with a condition taxes the brain on taking care of details in emergencies.

Two pilots with the same general background and experience might have a very great difference in their panic points. One pilot, who is continually thinking in terms of emergencies while flying and is mentally covering emergency procedures, is likely to have a high panic point. This pilot will take care of many details automatically and will have a relatively free mind to make sound decisions. Constantly striving to know what to do in advance of an emergency situation also saves seconds that might mean the difference in life or death.

On the other hand, the pilot who is not emergency conscious and who flies with little thought of coping with an emergency situation is likely to become involved in many details that should be automatic. This impairs his thinking out a problem and arriving at a sound decision.

It would seem that it all boils down to being able to think during an emergency. But you can't just stop there. You can't say to yourself, "Something's wrong. I've got to handle it in half a second before I hit the ground".

This kind of thinking is guaranteed to keep any aviator completely confused until the wheels hit the ground and the tail is motionless 15 feet in the air.

You must practice in your cockpit or in your mind just what you will do when the prop does stop turning. And you must know what you and your equipment can do. Then you will do the routine things automatically, and the emergency will become simply an unusual situation.

In this way if you really do have an engine failure, and your procedures do not start it again, your mind will not be cluttered with details. You can think clearly of the situation at hand and what to do about it.

Be aware that those "moments of stark terror" may come, that your hair can literally stand on end. But know also these moments are no time to give way to alarm. It is a time to make the brain keep working.

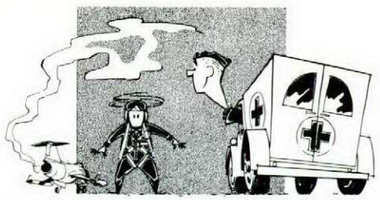
adapted from the United States
Army Aviation Digest

FSO'S FACT, NOT PHILOSOPHY —THE HUMAN SPARK PLUG

A most interesting conversation with an FAA officer divulged the fact that on many occasions ground personnel and/or aircrew have been observed to be standing or crouching under the wing of an aircraft during a heavy rainstorm. It might be said that these personnel know enough to come in or get in out of the rain. Excellent. However, heavy rainstorms have been known to be accompanied by lightning, which in turn has been known to strike an aircraft sitting peacefully on the ground, and finally, such strike has been observed to take the line of least resistance, and, in spite of big rubber tires and a static electricity grounding wire attached to the aircraft, the strike has used the human being as a grounding device.

The wing just overhead acts as the cap on a spark plug and the person as a ground thereto. All that remains to complete the sequence is the lightning strike which, if it hits the aircraft, causes the static electrically originated spark to jump between the wing and the person thereunder; through the person and so to the ground. The result is self-explanatory.

Minutes of Flight Safety Meeting
of 422 Auxiliary Squadron.



NEAR MISS

What Would You Have Done?

We departed North Bay in a T33 at 2083 Zulu for Lakehead on a cross-country training mission. The climb to altitude placed us 48 gallons above our estimate but eight thousand feet lower than our flight planned altitude of FL 390. The congestion of airways, which normally prevails late on Sunday afternoons, prevented a higher altitude clearance.

The upper level winds were approximately 100 kts in excess of those forecasted. This made us quite late by Sault Ste Marie with 70 gallons short of our estimate. Minneapolis Centre was contacted for a report on the upper level winds but prior to a reply both tip tank lights illuminated. Indicated fuel remaining was 384 gallons. The fuselage tank indicator began to lower and the closing of the head and foot warmers had no effect on the tip tanks. The main wing tanks were selected and the Duluth weather was checked. The present Lakehead weather was reported to be five thousand scattered, eight thousand overcast with good visibility. The cloud tops were at FL 250.

At this point our total fuel shortage was 170 gallons. One hundred gallons in the tips plus the 70 gallons shortage over Sault Ste Marie. The fuel shortage, upper level winds and the lower assigned altitude made our fuel estimate over Lakehead quite low.

A fuel emergency was declared and a straight-in RATCON approach was requested from Lakehead Arrival through Minneapolis Centre. A time and distance was completed by Grand Marais and we were passed over to Lakehead Arrival at 2215Z. A RATCON approach was requested three times before Lakehead arrival understood that a beacon approach was not acceptable. We were vectored starboard onto 330° in order to attain positive contact by radar at 55nm. This vector produced no results and a further vector of 030° was requested. We were then informed that they had no contact with us and we were cleared to the Quebec beacon for an ADF approach, to call outbound at 20,000. A descent was initiated and we entered cloud at 27,000 with the beacon on the nose. Our ADF readings and broadcast stations led us to believe that our radio compass was unserviceable. Our gyro compass started to slave to the right. Lakehead was informed and a UHF/DF steer was requested. This was unavailable at the Lakehead. Fuel remaining at this time was 113 gallons.

Squawking emergency, we broke out of cloud into a hazy undercast and the shoreline was sighted shortly after. A VFR descent was requested to enable us to repressurize our tip tanks and possibly orientate ourselves with the coastline. The tips began to feed at the lower altitude and our useable fuel was now 192 gallons.

We were obviously lost. The terrain was unfamiliar and the direction of the airport was unknown. We continued to follow the shoreline at 5000.

A description of the terrain was forwarded to Lakehead and a passing T33 from Gimli monitored our progress and attempted to locate our position on his maps. Our position was determined from landmarks and we proceeded to Lakehead. We landed without further incident with 147 gallons on board. Apparently our descent had commenced approximately 60nm northeast of Lakehead.

This situation could have had different results had the tip tanks not started to feed! The starboard vector, given to us, only placed us further from help. The southern vectors would have been more appropriate because of possible radar identification from below the border.

Watch That Altimeter

An Albatross was eastbound at 9000 ft in thin cloud. The crew were startled to see a MATS C124 pass westbound off their port wing at approximately the same altitude. The two aircraft were opposite direction traffic on the same airway and cleared with the usual 1000 ft vertical separation. The two tracks might well have been identical and a mid-air collision would have been unavoidable.

The crews of the two aircraft were able to contact each other by radio and each confirmed that according to their altimeters they were flying at their cleared altitude. It was then suspected that one of the aircraft must have an unserviceable altimeter but a subsequent check on the ground revealed that the altimeters in both aircraft were serviceable. What was wrong?

For one thing, each aircraft had their altimeters set on the setting given over their last reporting point. The C124 was on 30.07 and the Albatross on 29.62. This accounts for 450 feet. What happened to the other 550 feet is a matter of conjecture but considering the type of aircraft and the pilots' statements it is unlikely that either pilot was more than 100 feet off his desired indicated altitude. This could account for another 200 feet. Thus it might be concluded that the altimeters, although serviceable, had a combined error of 350 feet at an altitude of 9000 feet. A check of altimeter specifications indicates that if the errors are cumulative two serviceable altimeters can have this much difference in reading. At 9000 feet, it is probably quite rare but at 20,000 feet, for example, it is far more likely - and allowing only 100 feet for pilot inaccuracy isn't very much.

This all goes to show that 1000 feet vertical separation is not really enough, particularly at the higher altitudes of the altimeter setting regions. CFP100 para 9.41 states that a pilot must have his altimeter set to the nearest station enroute. In this case the C124 was at fault. However, the pilot did only what many others do: change the altimeter setting over reporting points. And even if CFP100 is followed exactly, the theoretical collision could occur at the mid point just as the pilot of each aircraft is reaching to reset his altimeter.

The obvious solution would be to increase the vertical separation, but the need to accommodate the ever increasing amount of IFR traffic makes this impracticable. Another solution might be to lower the transition altitude so that all enroute traffic is on the standard altimeter setting of 29.92 Some operators argue that this method does not give assurance of adequate terrain clearance unless the minimum enroute altitude is raised so high as to waste too much otherwise usable airspace. Perhaps a compromise is the answer - in fact, there is a possibility that the transition altitude will soon be lowered.

In the meantime there is a need for all pilots to fly their altitudes as accurately as possible and make sure their altimeters are serviceable. Even then, all of the 1000 feet separation does not exist so it's foolish to reduce the margin further by using an improper altimeter setting technique.

Straight-in Approach

A pilot was on a routine flight in a CF100. The aircraft was being flown on auto-pilot at FL 400 and everything seemed normal. However, when the auto-pilot was disengaged, both hands were required to free the ailerons. The controls remained stiff and the pilot descended to FL 250, then was cleared to 6000 feet, 35 miles north. At this point the pilot cancelled IFR and called for a straight-in approach. While downwind, he checked the controls, elevators free, and ailerons very stiff. When lined up with the runway, wheels and flaps down, controls returned to normal. The aircraft landed without mishap.

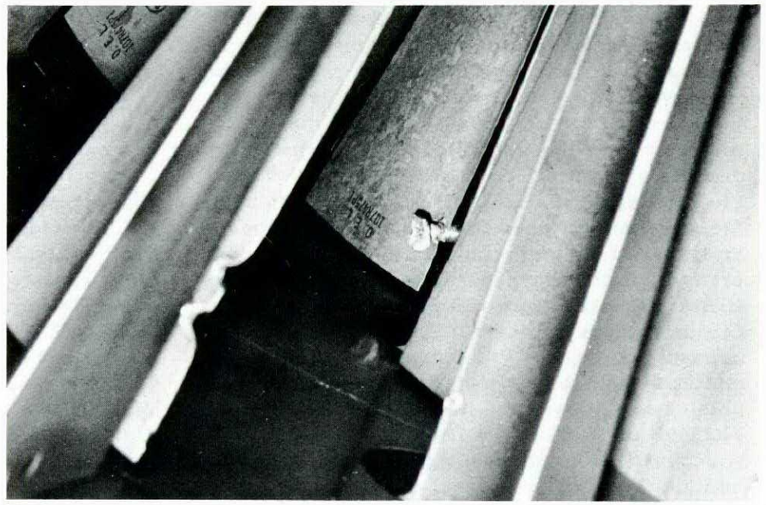
This situation had the making of a serious accident, had the pilot de-boosted the controls. The pilot's action was correct except that he did not report it to some agency prior to entering the control area.

This Near Miss was a direct result of washing the aircraft and flying it shortly afterwards. Ice had formed in flight between the floor and the aileron quadrant and also part of the way along the aileron cable. Aircrew had been briefed of the dangers of having water on the navigator's floor on the port rear side. Local orders have been written to ensure care is exercised during washing and also to restrict flight at least 24 hours after washing. Water could also be introduced into the cockpit by a heavy rainstorm especially if the canopy is left open.

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

ARRIVALS and DEPARTURES

CF104, FOD On an engine run-up the aircraft was heard to give a minor "woomff" and the engine was immediately shut down. Previous maintenance on this aircraft had involved the removal of some screws which had become lost and were replaced. They were obviously left where they could become ingested on startup. A revised FOD prevention procedure following maintenance has been introduced which will involve a much closer inspection of the engine intake area and a more careful accounting of missing screws.



CF104, FOD AGAIN! From an Air Div Flight Safety Bulletin: "On the start-up it was noticed that the rpm increase was unusually slow crawling up from 10% to 40%. At 40% the increase stopped completely for some 30 seconds before the rpm continued up to idle. The takeoff was normal, but during flight, speed and power seemed low in comparison with other aircraft. This oddity had been noticed on previous flights; four flights back the pilot noticed that he needed 2-3% more rpm than other aircraft to keep up with them. However, all pressures and temperatures were normal and a subsequent ground check including a run-up failed to indicate that any problem existed.

Shutdown of the engine was normal but because of the slow start in the morning the pilot requested that a start be carried out by the groundcrew during the BFI to ascertain whether the problem was in the aircraft or in the starter unit. When the groundcrew went to start the engine they found that it had seized during shutdown. Further investigation revealed that a number of turbine stator blades were missing.

The amazing lack of strong symptoms of this serious engine condition, which apparently had existed to some extent during four flights, calls for special attention. The aircraft had only 13 hours flying time since the last periodic inspection. Only chance—or benevolence—prevented the next inspection from being performed by AIB."

This is an excellent example of almost failing to recognize a warning that could have spelled disaster. When one aircraft performs much differently from all others there must be a reason—and that reason must be found even if the abnormality is within the limits prescribed in the EO. Failure to do so could result in a major accident. This applies to all aircraft, not just the CF104.

T33, DROPPED TIP TANKS The student, while strapping into his aircraft inadvertently pushed the panic button and dropped the tip tanks. Like beads on a string, panic button incidents have occurred over the years. The panic button guard was initially designed with a shallow configuration to ensure ease of instant activation in a crisis. This incident initiated some discussion since other "panic"-type switches in the T33 are hinge covered. It seems unlikely that panic can become so urgent that simply flipping a switch cover is too complicated and time-consuming an action.

T33, OXYGEN EXPLOSION An SE Tech was detailed to replenish a visiting T33 with oxygen, a job he was well qualified for and had done many times before. He turned the oxygen trailer regulator on and connected the filler hose to the aircraft. When the valve on the end of the hose was turned on, a hissing noise indicated a large leak due to a poor connection between the aircraft and the hose. As he reached to reseat the connector there was a sudden flash and an explosion. Although the airman quickly jumped back, he received first degree burns about the face and neck. Fortunately his eyes were protected by goggles.

The escaping oxygen torched through the aircraft skin in several places in the vicinity of the filler cap. When the oxygen was turned off, the fire went out.

The investigation indicated that there was some grease on the cockpit fresh air inlet tube which is behind the intake skin about an inch above the oxygen filler valve. The escaping oxygen probably came in contact with the grease and caused the flash fire. The airman was wearing an anti-static parka so it is not likely that static electricity was the cause.

This accident emphasizes the absolute necessity of ensuring that oxygen and grease do not come together. Even aircrew should not allow their flying gloves to become greasy as this could be a hazard when connecting or disconnecting their oxygen masks.

This accident also pointed out a discrepancy between the T33 EO and the oxygen trailer EO. In this case the airman was following the oxygen trailer EO and opened the valve on the trailer before plugging in the filler hose and then turning on the valve at the end of the hose. The T33 EO states that the valve at the trailer is the last to be turned on. This would seem to be the safer method and action is being taken to amend the trailer EO to conform with the T33 EO.

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 aircraft 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.

ARGUS, MAXARET FAILURE These are the four main wheel tires from the left bogie of an Argus. The main hydraulic pump had failed causing the maxaret brake units not to function and the emergency brake system had to be used. The landing was normal and there was no need for harsh braking or propeller reversing. However, the captain inadvertently locked the port wheels—it just goes to show you how easy it is to blow the tires when the maxaret units you are accustomed to are inoperative.

CF100, TWO MEN INJURED The canopy was removed to provide access for an intercom snag repair. The two sears which were uncovered by the canopy removal were by oversight or neglect NOT safetied. Apparently, during removal of the locking wire from the seat charge retaining nut, the sear was withdrawn from the canopy firing unit, resulting in the canopy firing unit being discharged, the canopy links fired and the canopy rails ejected.

The explosion threw one man back on the wing; the rail struck the hangar rafters and rebounded striking another man in the back. To help us understand accidents of this sort it certainly would be of help to have a text book on "The Psychology of Carelessness" as the man at fault had removed many canopies before.

CF100, FUEL JETTISON On a night target mission following the climbout the pilot selected tip tank transfer—at least he thought he did. Actually, he had by mistake selected the tip tank jettison. To complicate the situation one of the tanks failed to jettison fuel and cross-feed was necessary to drain the full tank. This mistake was the second incident of this nature at that unit and was attributed to selecting a switch without visually checking. The fix was made by rotating the jettison switch 90 degrees. Familiarity often breeds contempt; the cockpit of an aircraft is no place to be blindly flicking switches.

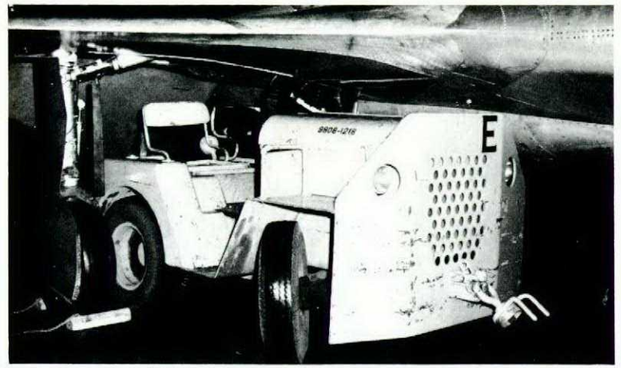
F86, NOSEWHEEL SNAPPED OFF While awaiting a planned takeoff time at the end of the runway the pilot engaged the parking brake. On releasing the brake, power was applied to commence taxiing. The aircraft with nosewheel steering engaged, started a turn to the right. The pilot thought he had lost his nosewheel steering and applied power and left brake to re-engage the nosewheel. In actual fact nosewheel steering had not been lost; the tendency to turn to the right was because the right parking brake had not been completely released. Thus the high power and left brake were forcing the still engaged nosewheel at right angles to the direction it was pointed and finally caused the oleo strut to fail.

While the pilot may have erred in applying too much power, this accident points up the poor design of the Sabre parking brake. Although there is normally little need for a pilot to use parking brakes in a Sabre, if he does, he should ensure that both release properly before taxiing.

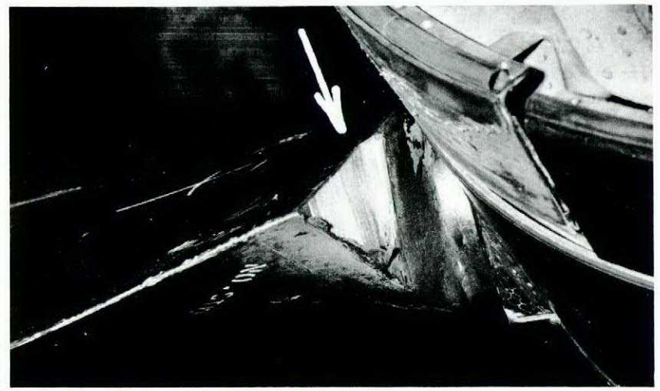
CF101, TOWING A Voodoo was being towed down a slight grade on a wet surface between hangars. A turn to the left was commenced and the inertia of the aircraft caused the mule to commence skidding sideways. The towbar snapped as the mule jack-knifed. The aircraft continued rolling toward the mule and came to rest in the position shown in the photograph. Skin and minor structural damage resulted as the mule was jammed beneath the aircraft wing.

Several mistakes were made. The mule was too light for the weight of the aircraft. The brake rider had pulled the emergency brake but the investigation revealed that the accumulator had been bled previously leaving only 600 lbs available for braking. In addition the brake rider pumped the brakes, thinking that this would increase brake pressure. In fact, this procedure bleeds off pressure in the system.

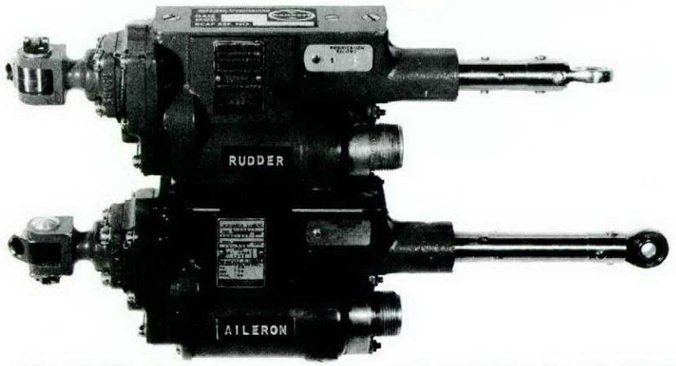
Violation of towing instructions using the wrong type of mule and improper emergency braking technique caused this ground accident. An aircraft was damaged as a direct result of disobedience of orders.



HERCULES, CREW FATIGUE It was 4:30 in the morning when the job was completed. The repair crew had reported for duty at 1700 hrs the previous day after being given three hours to return home between shifts. The long hours of weekend work took their toll when two bolts of the propeller hub assembly were not installed. During the subsequent runup the propeller sustained blade damage. In an attempt to have the aircraft available for alert the repair crews were pushed beyond sensible limits. The supervisor was obviously to blame.



YUKON, MURPHY'S LAW After takeoff full aileron trim and some physical force was necessary to keep the aircraft straight and level. The aircraft was landed without incident. Someone had installed a rudder trim actuator in the aileron trim mechanism! The photo shows the vitrually identical appearance of the two trim actuators. The component had been incorrectly labelled from the contractor but should have been positively identified by part number. We should have seen this one coming a long time ago.



The identification labels were placed on the actuators for identification on the photograph.

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 Sir:

After a close scrutiny of the article "Prepare for a Letdown" (Mar-Apr 64 Flight Comment) I think a few cautions should be emphasized.

It is true that three or four shroud lines in a row can safely be cut but it should be emphasized that it is definitely a last resort and the lines should be cut only when all other attempts to free yourself have failed. The cut lines will cause rotation and slide-slip and consequently an increase in rate of descent. Three or four may be alright but if enough of them are cut, the 'chute will collapse.

Trying to beat the auto mechanism if you eject at low altitude is sound advice because if you do beat it, it wasn't working correctly to start with. However, if you do then you must remember that you have to pull the "D" ring (CF101, CF104 and Tutor) because the 'chute will not automatically be armed. There was even an example of a pilot (in another Air Force) who undid his lap strap prior to ejections. This of course is obviously foolhardy! So try to beat it only after ejection and if you do, then don't forget to pull the "D" ring.

The section on steering and turning your parachute also needs a few cautions. In the first place, manoeuvreing is difficult so don't expect much success. The chutes used for emergency descents are smaller and less manoeuvreable than those used by professional parachutists. Secondly, most people on their first parachute jump find it very difficult to estimate where they are going to land. Usually you touch the ground short of where you thought you would. Manoeuvreing could actually cause you to hit the very obstacle you are trying to avoid. Also, manoeuvreing increases the rate of descent and more important, if done by a novice, it is quite likely to induce oscillations which may cause more problems on landing than the manoeuvreing was intended to overcome. To reduce the possibility of oscillations it is extremely important that the procedures be done gently. Manoeuvreing within 300 feet from the ground is especially hazardous and should be attempted only as a last resort to avoid a really dangerous obstacle.

S/L LD Allatt
AFHQ/DAEng

Dear Sir:

The reaction of at least half a dozen aircrew members who have taken the trouble to call regarding my recent article - "Whatever Happened to Old Charlie..." - is one of disbelief.

It is unfortunate that the following paragraph, which was meant as a preface, was lost on its way to the printer and I hasten to assure your readers that the article was anything but a work of fiction:

> "Although this story is not autobiographical, it is nevertheless based on an actual case history. It is being printed to acquaint aircrew with what is considered to be an unusual, yet very real side-effect of the smoking habit".

F/L P Nyznik
SNavO, 408(R)Sqn

BACK UP TO AN ACCIDENT

To save time, a driver of a refuelling bowser reversed his vehicle to the next aircraft to be serviced. He opened his left door to see better, and in passing close to the aircraft, the door struck the nose cone, causing damage.

The driver was relatively new to the section and apparently was not aware of the regulations in use regarding reversing vehicles on the flight line. He may also have been influenced by the effort involved in reeling and unreeling hose lines and that aircraft were being refuelled in order of priority of use rather than in sequence.

Are the drivers around your flight line properly briefed and aware of the dangers of shortcuts? Are section orders readily accessible and/or prominently displayed?

HOT WEATHER LIFTLESS DODO

Although nearing extinction, this migratory bird is occasionally sighted around airports on very hot summer days at which time it becomes readily identifiable by its unusual antics on takeoff. Ignoring the effect of high temperature on takeoff distance this dim-witted Dodo foolishly attempts to get airborne on too short a runway.

Vigorously, but in vain, it flaps its inadequate wings to the runway's end, and although reaching a high speed it cannot get airborne. Consequently it comes to rest in the overrun, battered and bruised in a disarray of feathers, flesh wounds and fowl words.

Throughout the last stages of its futile flapping it emits its characteristic call:

CALL: STALL STALL STALL THERE'SNOLIFTATALL!

SUMMER Vacation!

- Thorough maintenance check before departure
- Pre-flight checklist — (bathing suits, golf clubs, fishing tackle)
- Survival equipment (first aid kit, suntan lotion, life preservers)
- Drive as you taxied on your first solo (stop for a break every couple of hours)
- Take it easy, enjoy yourself
- Come home refreshed and accident-free