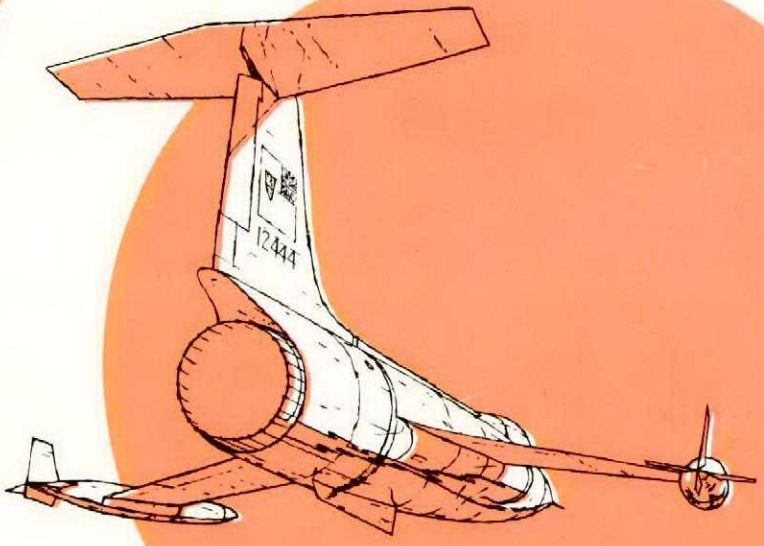
RCAF

FLIGHT COMMENT

64

LOWER THE SCORE IN SIXTY-FOUR



JANUARY • FEBRUARY • 1964

FLIGHT COMMENT

Editor-in-Chief—Squadron Leader W. A. Smith

Editor—Miss A. V. McIntosh

Editorial Assistant—Miss R. Mayhew

Circulation—Flight Lieutenant O. G. Amesbury

Artists—J. A. Dubord
H. K. Hames

C O N T E N T S

Articles

Features

ROYAL CANADIAN AIR FORCE

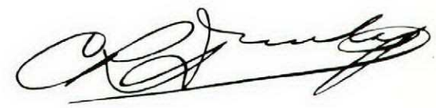
DIRECTORATE OF FLIGHT SAFETY

A preliminary review of the 1963 aircraft accident statistics indicates no new major areas of great difficulty but rather a repetition of well known accident causes. Some successes were achieved by dedicated professionals whittling away at the difficult task of attempting to lower an already low accident rate. The complexity of our new equipment and the fact that our old equipment is one year older emphasizes the magnitude of such achievements. But in some areas we have regressed. There is a need for us all to give even greater support to our flight safety program.

Flight Safety is a product of doing something correctly. In nearly every accident there is evidence that someone somewhere did something that was not exactly correct. There are some risks anytime an aircraft takes off and there are some missions which warrant a greater risk than others. As members of the RCAF we accept these risks. But we must be continually alert to spot incidents and hazards, and take corrective action before they cause an accident.

The focal point of any flight safety program must be centered on the individual. Professionalism and discipline must be the keynotes. Individuals who do not possess this professional attitude and sense of discipline must be recognized and eliminated. Some cases are clearly evident, others less so. Commanders at all levels must diligently exercise their responsibility in bringing these cases to light so that the quality of our personnel remains high. Aggressive leadership is of paramount importance in the prevention of accidents.

High standards of Flight Safety are the synthesis of the quality of our equipment, the leadership of our commanders, the talent of our crews, and the dedication of our airmen. I commend all members of the RCAF for the good safety record of 1963 and I urge continued effort and vigilance to improve it still more in 1964.



(C R Dunlap)
Air Marshal
Chief of the Air Staff

64

ACCIDENT PREVENTION

CAN WE LOWER THE SCORE IN SIXTY-FOUR?

Are you aware of at least one aircraft accident in 1963 that could have been prevented by better supervision, better design, better maintenance or a better pilot?

Stop and think a minute, we have had accidents that should not have happened. But they did, and we are that much poorer in manpower and aircraft because of them. This is the impersonal view but we all regret and are shocked at the loss of our colleagues and friends. Let us review our accident prevention program with the purpose of improving to make it more effective. We are not interested in change for the sake of change nor do we consider it effectual to run about waving a big FLIGHT SAFETY banner.

Basic to our thinking is the concept that the Commander—and here we mean from Flight Commander to the Chief of the Air Staff—is responsible for flight safety. The CAS has the final responsibility and he must report on flight safety and accidents to the Minister of National Defence. After a major accident the CAS forwards as quickly as possible to the Minister a statement of the facts as known at the time. It is therefore acknowledged that there is a deep concern displayed in accidents at our highest echelon.

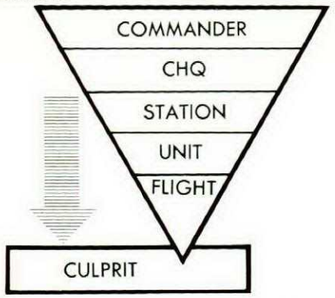
Unfortunately, there are many demands on the CAS's time and flight safety is but one. The same can be said for all senior staff officers. The interest in flight safety is in ratio to the gravity of the accident. When a major accident occurs flight safety comes to the fore but much of the attention is directed towards finding the cause and apportioning the responsibility. After a serious accident, which of the following thoughts are most likely to leap first into a supervisor's mind:

WHO IS RESPONSIBLE?
HOW CAN WE PREVENT ANOTHER?

Perhaps we realize what should come first, but what likely happens is what I call the phenomena of the reversed pyramid. We all know chain of command, and how authority and responsibility flows from a broad base up to the commander. What happens after an accident - this flow is reversed in effect, and responsibility, righteous anger and perhaps some "buck-passing", flows down. The meaning of this is illustrated below.

Before an accident

After an accident



We don't wish to lead you to believe that this is a bad thing, certainly the cause must be found, and responsibility must be allocated. We firmly support all activities in this regard, and the whole basis of our accident prevention program is based on experience gained in previous accidents. But we also suggest that when an accident happens, the kind of supervisor we respect is the one who will conscientiously ask himself.

HOW MUCH DID I CONTRIBUTE TO FLIGHT SAFETY IN THE PAST MONTH?

HOW MUCH DID I HELP TO CAUSE THIS ACCIDENT?

If this self-examination proves it necessary, he takes corrective measures.

Now some will say: What was the Flight Safety Officer doing? It must be his fault. Think a bit, the FSO is only an adviser, he has no executive authority, and perhaps he might have done more to assist his commander, and this will have to be determined. One must also check to see if the commander has supported his FSO and implemented worthwhile suggestions.

Most personnel in the RCAF are doing excellent work in the flight safety field and our accident rate compares favourably with other major Air Forces, in so far as such a comparison can be made. However, aircraft are extremely expensive and although they can be manufactured, personnel are irreplaceable. Obviously a more effective flight safety program should reduce our overhead and pay big dividends.

Now is a good time for us to look at Flight Safety and plan to do so at frequent intervals during 1964. What are some of the things you might see?

A Command HQ where one lone officer is the Flight Safety staff. Perhaps this is the correct number. I don't know. But I do know that the Flight Safety Officer of that Command is a very busy man. Has he time to think and plan, or is he too busy just "pushing paper"?

Stations where the "slip-crews" of long range aircraft find it nigh impossible to sleep during the day because of lack of adequate facilities.

Stations where lack of transport, frustrating delays, and lack of co-operation discourage stop overs and encourage "get-home-itis".

Pilots who choose to ignore instructions and orders, thereby hazarding themselves and their aircraft, plus anyone who is with them.

Technicians who disregard EOs because they are in a hurry, or know a "better way".

Supervisors who only allocate time and effort to flight safety AFTER an accident.

In conclusion, many supervisors are making substantial contributions to flight safety. But why not another conscientious review of our efforts at this time? Remember, it is the supervisor, at all levels, who is ultimately responsible.

ACCIDENT PREVENTION - CAN WE DO MORE IN 64?

(D Warren) W/C
AFHQ/DFS

LOOK OUT BEHIND

Although aircrew protective helmets are designed to give valuable protection for pilots within an aircraft, they are of little use against such hazards of a busy flight line as whirling propellers, jet blasts, or snowblowers. There was a case last spring (when the snow was still around) where a pilot, after shutting down his aircraft, walked across the flight line still wearing his protective helmet. Since these helmets are quite effective sound reducers, he failed to hear a snowblower approaching from behind. Luckily he was not ingested and only received head lacerations, broken ribs, and bruises from the encounter. In fact the helmet prevented more serious head injuries. On the other hand, had he not been wearing it, he would undoubtedly have heard the snowblower and been able to get out of the way.

Wearing an aircrew helmet while walking across a busy flight line doesn't seem very healthy.

FLIGHT LINE FASHIONS

by McINTOSH
and MAYHEW

F/O Sam Sonic the speedy pilot nipped quickly out to his T-Bird to do the run-around. The temperature was -25°F and wind was a steady 20 knots from the North. After a fast look-around he climbed into the cockpit and was chagrined to find that his hands were so cold and stiff inside his gloves flying (outer) that he could not put on his helmet over his frost-bitten ears.

He looked over at the next T-Bird and saw F/O Frank Smith Oliver, that upstanding paragon taking his time and with a pleasant smirk on his face, get into his plane. Frank knew his CAP 602/B2, had equipped himself fully, and having taken advantage of the winter flying clothes available to him, was not suffering from the cold as was Sam. He carefully considered which items of clothing were necessary for specific missions.

What is your attitude to proper flight clothing, especially winter? Are RCAF aircrew becoming more conscious of the safety implications in dress? Take a closer look at your fellow aircrewmen and judge for yourself. You will see that the latest flight line fashions still include an occasional hotrock wearing half-Wellington boots, the manly type who unzips his flight suit to expose a hairy chest and the bare-handed character who thinks gloves are only for formal occasions. What if he has to bail out, or make a forced landing in zero weather?

Let's take a case from the records.

Moe Muddler had muddled again and his instructor Brian Benden was slightly annoyed as they drifted down to earth 'neath their shimmering silken canopies. Absently picking some thorns out of his nether regions Brian trudged over the hard gravelly ground to where Moe lay. "Knave" quoth he "let us hie to yonder tavern and reflect upon this mishap over a flagon of mead". "Sire" quoth Moe smiling weakly "both mine ankle joints hath broke and, happens I could not traverse this rocky thorny ground anyway since mine footwear (Oxfords) departed when by canopy deployed".

In all fairness we don't see as many of these types as much as we used to. More equipment is available now and although some aircrewmen are reluctant to make use of it through old habits, or negligence, the sensible approach is generally considered better than the blasé.

Clothing designed for the RCAF is essentially functional. A combination of smart styling and functional makes a well groomed aircrew but this is sometimes difficult to achieve.

Winter flying clothing is designed for a very simple reason, to keep aircrew warm. It must be suitable under a variety of conditions. The clothing must be light enough to be comfortable in the cramped quarters of modern aircraft and must also provide an adequate protection under survival conditions. A few years ago this dual problem was easily solved. If aircrew wore all the clothing required to keep them warm while airborne, they could probably survive the coldest night if they bailed out.

Times have changed. Aircrew no longer need to worry about the cold in their new heated cockpits. The heating system of the CF101 is good and even on the coldest night one is comfortable. Since much flying in that aircraft takes place at night, it is quite possible that if you bail out you would not be found until at least the following morning. The airlines advise tourists to dress for their first stopover rather than for the climate they are leaving. In the cockpit, is where you go and hope to stay - but there is always the probability - you may be forced out - so dress for where you might be going - in Canada in the winter - brrr - usually somewhere very cold, at least from October until April.

What can be considered the minimum flying clothing acceptable for Voodoo aircrew? The two-piece thermal underwear is warm, light and available in quantities. The heavy grey wool socks have been in the RCAF for years and one pair should suffice. The two-piece flying suit has replaced the single one and is as warm and much lighter. It has another good point, in that the jacket can be removed, thus providing a modicum of comfort indoors. The blue wool turtle necked sweater fights off that cold wind that blows down your back. Next your hand, nylon inner, leather outers and mitts are the most suitable. The latter has found to be practical on walk-arounds and while strapping in.

Perhaps one of the most important items is footwear. The rubber overboot is worn over the felt or leather boot and should be used more in the Fall and Spring. During the daylight hours of these seasons, the temperature rises and rain and melting snow make the station area and countryside extremely wet. At night the temperature falls and a person with wet feet trying to last the night in the bush could end up like our fictitious Moe Muddler. During the winter, the nylon mukluks, and liners are still the best bet for warm feet. Nylon is superior to the old cloth variety since the latter are extremely difficult to dry even when only slightly damp.

Air Transport Command has its peculiar problems regarding winter flying clothing. Crews engaged in passenger service, special or routine flights, are unable to wear issued flying clothing because of its unsatisfactory appearance. Environmental protection is provided with a parka, long underwear, and flight boots, depending upon conditions. Because of various factors, it is impractical to wear heavy clothing in the cockpit. The use of service dress has however, created the problem of crew (authority) identification on the Transport aircraft and no satisfactory solution to this has yet been implemented.

The crew of aircraft engaged in cargo, tactical, training, reconnaissance and other flights wear flight dress depending upon the nature of the flight and the type of aircraft. Environmental clothing is carried in the B-25 kit and worn when necessary. Local orders issued by the unit commanders govern the wearing of flying clothing, and a degree of standardization is maintained within each individual crew on any one particular operation.

ATC's biggest demands are for flying garb that is smart in appearance, practical in weight, and durable in finish to provide standardization, particularly among crews engaged in passenger flying. The difficulties are to find an outfit that will satisfy all the strong individual preferences expressed on the subject and be functional and smart.

The job of the ferry pilot requires operation in most climates in Canada, of aircraft types ranging in variety and size from the Chipmunk through the T-33 to North Star. Assuming he takes advantage of all available items, he will have a certain amount of choice in selection of gear from a particular ferry operation.

A typical trip might be to move an Expeditor from Trenton to Winnipeg and return in a T33. Typical weather conditions might well be rain at Trenton, 20 below zero and snow at Winnipeg and you name it at Lakehead. In this hypothetical situation, which, alas, occurs every winter, the pilot selects the best combination of available items to avoid overdressing at "A" and freezing at "B" while allowing for best cockpit efficiency enroute. He will balance the practical consideration of flight over open water and frozen wilderness against the sartorial consideration of a possible overnight stop at Winnipeg.

From the feet up his essential issue wardrobe would probably be: rubber overshoes, felt flying boots, woolen socks, two-piece cold weather underwear and two-piece winter flying suit.

Optional accessories would include sun glasses, aircrew toque, winter hood, glove inserts and outers, mitts, woollen sweater and suitable officer's hat.

Variations from the public issues are most likely to be with footwear, underwear, gloves or mitts and headgear. Many pilots feel that the existing issue of gloves is inadequate for winter.

Footwear is a contentious subject because of the impracticability of the mukluk combination anywhere except on actual winter survival. The new felt flying boots are just becoming available. The aircrew toque is another welcome item which only recently appeared on the scale of issue.

Keeping presentable for overnight stops will remain a problem. Because of the versatility required in ferry work no hard and fast standards for winter flying clothing can be set. Much will be left to the individual's preference and good judgment.

The vast majority of flying in Maritime Command is conducted over ocean, therefore the worst survival environment conceivable is a ditching in the North Atlantic in winter. A glance at a survival time limit graph indicate that death comes within a very few minutes unless special protective clothing is worn. Unfortunately the flying suit material that would be suitable for such an extreme condition and at the same time be acceptable for wear during a patrol has yet to be invented. The extremes are just too great and the specification of the ideal for each occasion conflicts to such an extent that it may be impossible to produce such. This has been a problem for many years and the object of much study and trials. The answer of course is to carry special ditching suits which are permanently installed in the aircraft to be donned as soon as a ditching is deemed necessary. This takes time but is acceptable because when considering a four-engined aircraft in almost any possible situation it can safely be assumed that there will be at least a few minutes available for the distribution and donning the ditching suits.

No attempt is made to supply clothing adequate for winter bush or arctic survival as when MAC aircraft have occasion to penetrate those regions the standard B-25 kits are carried for that trip only. For the regular Maritime patrol the standard RCAF issue clothing is used but here there are problem areas. These are more related to aircraft design than to the suits themselves but nevertheless it may well prove easier to redesign the flying clothing rather than aircraft components.

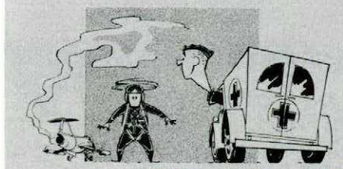
The main concern in MAC, and this is probably true of all large aircraft, is the marked temperature difference throughout the aircraft at any one heater setting. This matter is complicated by heat radiated by electrical equipment and sunshine through perspex in some areas in contrast to the cold and draughty sections of the aircraft. It is hard to set a temperature that wouldn't cause at least a third of the crew to grumble (crew of fifteen for twenty-four hours is a lot of binding). It can easily be seen what this condition leads to eventually; after a few hours nobody is dressed the same, as they have shed their clothing in varying degrees in an effort to be comfortable.

All things concerned the closest possible approximation to the ideal for winter operation on a normal patrol is the regular flying suit. It is entirely adequate to maintain body warmth in case of heater failure and will provide adequate insulation inside the ditching suit for cold water for a long period.

Styles can't change overnight and even from one season to another because of procedures involved. First and foremost in the system is the quantity purchasing which must be made by the purchasing authority to obtain an article at a reasonable cost. Once this purchase is made, a complete attrition must be accomplished before the introduction of a superceding article.

Flying clothing is constantly under review regarding improvement, and the design authority personnel at AFHQ work closely with the requirements staff to co-ordinate research and development carried out by the IAM. Once a new design has been evolved, user trials are conducted to obtain aircrew comment and a reading on the acceptability of the new item. This process can take considerable periods of time from the origination of a new development until its acceptance and introduction into use. A means of reducing the bulk of the winter flying clothing while still retaining the protection required, is under study at this time. To do this, new materials must be found which will withstand the many tests considered necessary prior to their use in protective dress. In addition to the facilities of the IAM being used for development, the Department of Interservice Development has a direct input to the project. This department has access to and knowledge of the materials available in the textile manufacturing industry, and assist in specialized research as necessary. The process of a suggested modification or improvement is usually originated by the user aircrew in the form of a UCR and although each UCR is individually actioned a surprisingly small number of UCRs are received.

What of the forecast for flight line fashions? Navy blue summer flying suit, made of a good textured fabric, modelled after Golden Hawks? One piece crash helmet? Zippered mukluks? New aircrew watch? Distinguishing coloured life jackets for aircrew and passengers on transports? Any suggestions?



NEAR MISS

THIMK

After a routine OTU training mission in a Voodoo, a clearance was obtained for a TACAN/GCA approach. Under VFR conditions during handover to GCA final controller, the 5000' descending check was initiated. When the navigator called for "pusher off" the pilot turned off a switch and shortly after the starboard engine flamed-out. He immediately overshot and made three unsuccessful attempts to relight, and was just calling the tower to tell them that a normal ground crank would be attempted when he discovered the engine master switch was in the off position. With the switch on, a normal re-light was carried out and the aircraft landed safely.

This Near Miss points out the necessity for pilots to be completely familiar with cockpit layout and most important they should know exactly which switches they select. This pilot did show presence of mind in that he overshot immediately and climbed to a safe altitude where he could properly assess the problem and take corrective action.

SGT WRG WOOLCOTT

Flight Comment is pleased to award a Good Show to Sgt WRG Woolcott for his exceptionally fine work in handling an emergency situation involving an F102, call sign Hotel Lima 20, on 4 Sep 63. HL20 declared an emergency when the front starboard side panel of the windscreen blew out while it was at altitude approximately 150 miles North of Goose Bay. The aircraft was immediately descended and vectored by GCI to a position 50 miles North of Goose. Here at 15,000 feet a random radar pick-up was initiated by Sgt Woolcott. It was evident that radio communication would be most difficult due to excessive cockpit noise created by the missing canopy panel. At a range of 35 miles, two-way communication could not be maintained with HL20 due to this noise and control instructions were obviously not understood by the pilot.

At this point the aircraft's altitude could not be determined; GCI could offer little assistance due to moderate precipitation interference on radar within the local area. A second F102 returning from the same GCI mission was contacted by Sgt Woolcott who attempted to vector it onto the emergency aircraft at 15,000 feet. This pilot reported that he was in and out of cloud at 15,000 and that he was unable to establish visual or radar contact with the emergency. After two more unsuccessful attempts at this manoeuvre, a blind transmission was received from HL20 advising that he was climbing to 17,000 to remain in the clear. With this information a successful vector was completed and a normal radar approach and landing was carried out.

During the recovery of HL20 Sgt Woolcott displayed a most calm and professional manner, leaving no doubt that he had the situation under control at all times. Additional pressures were evident in Ratcon, for a search was being conducted in the local area for a crashed aircraft prior to and during the above operation.

Sgt Woolcott's action, his keen appreciation for this particular problem, and the handling of same under adverse conditions was exemplary.

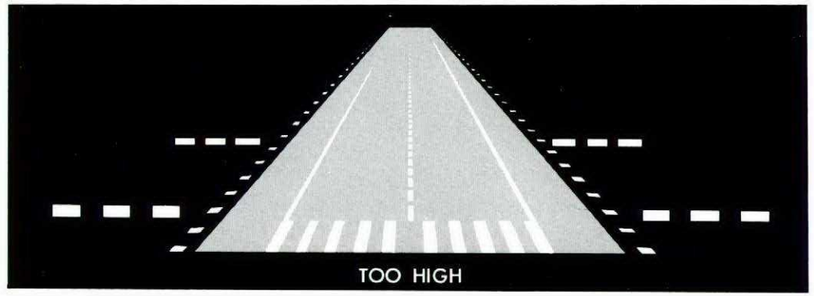
VASIS

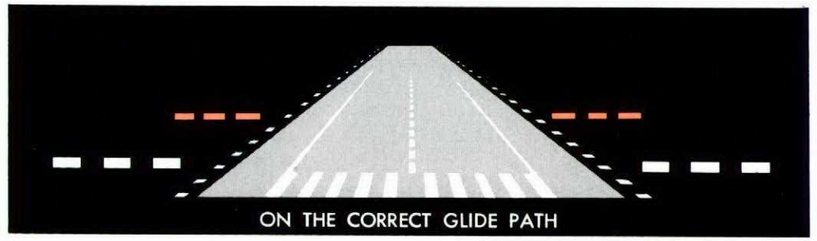
VISUAL APPROACH SLOPE INDICATOR SYSTEM

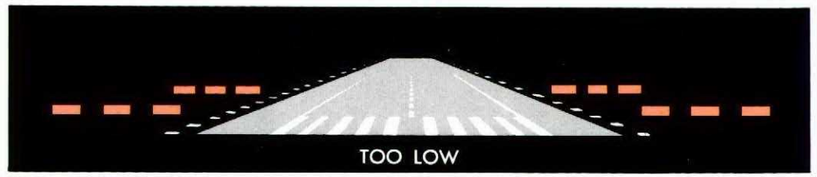
Facing an accident board as a result of a short landing is rather conducive to an inferiority complex. Even more damaging to the ego is the victim's own impression of what others think of him. Pilot error is the verdict and one's only defence is "But I had it made." Sure he had it made or he wouldn't have landed; so what did happen? It's not enough to just say that the pilot goofed. Even the old heads do it, so there must be more to it than that.

This is the pilot's impression of his short landing: On completion of a high altitude airborne interception mission in a CF101B a TACAN approach with radar vectors and GCA was carried out onto Runway 32. The approach and GCA were normal. At the transition point (from GCA to visual conditions) and 1/2 mile from touchdown the aircraft was on the glide slope and on the center line. Airspeed was 190 knots (5500 pounds of fuel remaining), fuel flow 4000 pounds per hour per engine, undercarriage and flaps down with speed brakes extended and a rate of descent of approximately 600 fpm.

The runway was partially plowed and the proposed touchdown point was visually anticipated to be on this dark appearing portion. The undershoot area appeared very white; there







was very little contrast and I do not recall seeing any approach or threshold lighting.

To my surprise the aircraft touched down prior to any attempt to flare out. Until a ground check had been made I did not know whether I had touched down on the unplowed undershoot area or the white concrete button.

After the transition to visual reference, the pilot was faced with a white-out depth perception loss which he did not suspect. The reason for this loss was the visual merging of the falling snow, the fresh snow on the ground and the partly cleared white concrete button. This expanse of white was unbroken by any markers which would give a depth indication.

As a result the aircraft struck the ground approximately 165 feet short of the runway button in about three feet of snow, bounced and touched down again, this time on the runway. The pilot had not reduced power nor had he attempted to flare prior to striking the ground.

This and many other instances of pilots touching their aircraft down short of the runway have demonstrated the need for an aid which will enable pilots to observe the desired glide path without relying entirely on their depth perception. This need was recognized even during the war and a few old sweats will remember the glide path indicators then in use at some airfields. These consisted of a single source of light which changed from amber to green to red according to whether you were above, on, or below the glide path. The trouble with this indicator was that its accuracy was not dependable and it was useful only at night. For the past several years many agencies have searched for a simple, reliable and inexpensive means of providing pilots with a visual glide path which could be used both day and night. In recent years with the advent of higher performance aircraft which are much more critical in the approach phase prior to landing, it has become all the more important that a satisfactory glide path indicator be found. Also, the greatly increased cost of modern aircraft makes the consequences of a short landing far more expensive.

Of the several systems developed, the choice narrowed down to either an Australian developed "Tee" Bar system or the British Visual Approach Slope Indicator System (VASIS). The two systems are nearly equally effective but the RCAF as well as the UK, USA, and other countries have chosen VASIS as being the superior of the two.

A complete VASIS installation comprises four wing-bars of light (of three light sources each) arranged in two pairs. The first pair with a wing-bar on each side of the runway is located 500 feet from the threshold and called the downwind bar. The second pair is located 750 feet further down the runway and is called the upwind bar. The distance between the two pairs can vary from 500 feet to 1000 feet to suit local siting conditions. The visual glide slope reference point is midway between the two pairs.

Basic principle of the VASIS is that of colour differentiation between red and white. Each light source consists basically of a flat rectangular box with a slit in the face presented to the approaching aircraft. The light sources emit beams which converge in the vertical plane, the cross-over being at the slit. Just in front of each source is a red filter covering the upper half of the converging beam. As a result, the diverging beam emitted is red in the lower half and white in the upper half. The absence of a lens means that there can be no possibility of colour mixing due to condensation or frost on the surface of the lens. The intensity of the lights is controllable, and adjustment in intensity can be made at the request of the pilot in the approaching aircraft. The lights are so arranged that the approaching pilot will see:

If above the glide path:	WHITE	WHITE
	WHITE	WHITE
If on the glide path:	RED	RED
	WHITE	WHITE
If below the glide path:	RED	RED
	RED	RED

The glide path angle can be adjusted and will normally be set at either 2-1/2° or 3° incline to the horizontal to coincide with the ILS or GCA glide path. The lights can be seen as far as the existing visibility, up to a maximum of 4 to 6 miles by day and better than 15 miles by night. Under bright snow conditions or when looking into the sun this range decreases to about 3.5 miles. The beam is fan-shaped and covers about 30 degrees in azimuth and about 8 degrees in elevation.

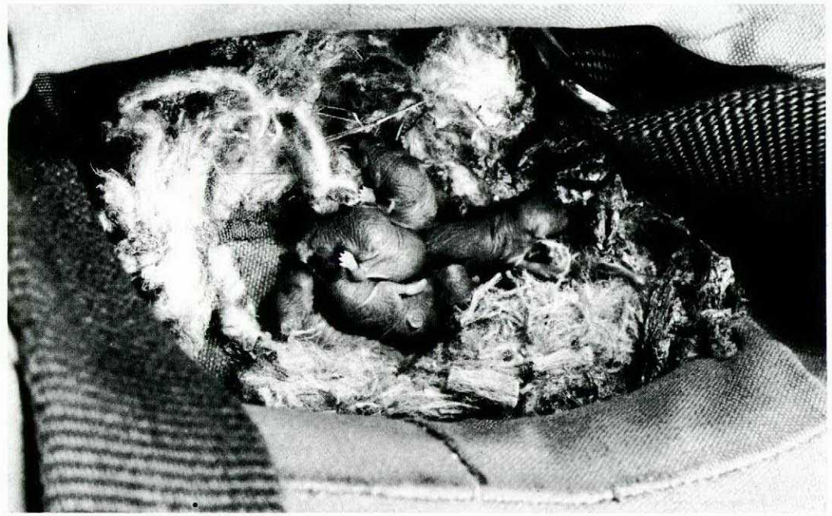
The proper procedure for a VASIS approach is to fly inbound on the centre line using the runway lights for azimuth information and maintaining a constant altitude. When the glide path is intersected the downwind bars will change from red through pink to white. The pilot should then begin his descent keeping the upwind bars red and the downwind bars white. If deviation from the desired glide path occurs, the lights will change colour. If the pilot starts to go low, the lower bars will change from white through pink to red and if he goes high, the upper bars will change from red through pink to white. The system provides easily usable glide path indications right down to the height at which flare-out begins.

Most pilots who have flown a VASIS approach agree that it is very easy to fly, and practice to become familiar with it is not necessary. There is no chance of ambiguity, the indications are easily interpreted and the transition from one colour to the other is not abrupt; there is a pink transition sector which subtends about half a degree and gives warning of impending departure from the nominal corridor.

VASIS installations have been approved for Comox, Cold Lake, North Bay, Bagotville, Chatham, Zweibrucken and Soellingen, and is under consideration for seventeen other RCAF airfields. In addition, DOT installations will be made at some of their major airfields.

During the period 1 Apr 52 to 31 Mar 61, accidents caused by pilots undershooting or overshooting have cost the RCAF approximately $15,000,000. Every one of these might well have been prevented by a VASIS installation.

OF MICE AND MEN



The housing shortage is being felt even in the animal kingdom. Here is a case where a parachute served as a maternity ward. The parachute in question was placed hanging up in a locker but with the seat part resting on the bottom of the locker. This occurred on a Thursday and the student pilot did not fly until the following Tuesday.

On taking the parachute out of the locker the student's curiosity was aroused by a small squealing noise. This is when he discovered he had become a god-father to six little mice. Needless to say, the parachute was returned to the Safety Equipment section to be replaced with new nesting material.

Of course this is an isolated case but if possible, parachutes should be hung up on the pegs provided. By doing this, parachutes can be kept clean and also out of the way of pregnant animals, unless of course, they carry their own ladder. Take care of your parachute, you may need it someday.

STN MOOSE JAW

WINTER CHECKLIST

FLIGHT PLANNING

- Clothing and Survival Equipment.
- Sun Glasses.
- Runway conditions & Braking Action
  - Base of departure
  - Destination
- Icing conditions require more power fuel.
- Check Pilot reports.
- Notams on obstructions & hazards.

PREFLIGHT

- Preheat batteries, APU's, engines.
- Airfoils free of ice, snow & frost.
- Static vents & drain holes clear.
- Microswitches free of ice.
- Anti-icing & de-icing equipment.
- Ice grip chocks.
- Wheels & brakes not frozen.
- Operate flaps & controls full travel.

GROUND OPERATION

- Ground handling equipment & vehicles clear of the aircraft.
- Oil temperature & pressure limits.
- Taxi slowly—nosewheel steering less effective.
- Avoid throwing slush and snow over aircraft surfaces on runup.
- Watch for sliding during runup.

BEFORE TAKEOFF

- Re-check flight controls—unlocked and full travel.
- Instrument letdown plates available.
- Navigation radios tuned.
- Flight instruments—set for departure procedure.
- Takeoff data—computed for existing conditions.
- Brief crew on departure.

TAKEOFF

- Do not overboost engines.
- Check nose steering after lift-off for indication of frozen strut.
- Exercise wing flaps and gear.
- Make radio calls when safe to do so.

CRUISE

- Operate flight controls and trim tabs periodically.
- Pilot reports on conditions.

APPROACH

- Obtain weather and runway data
  - Temperature & braking action.
- Check landing data for actual conditions.
- Brief crew on approach.
- Clear windshield.
- Ask tower for obstruction briefing.
- Cross check altimeters throughout aircraft.
- Co-Pilot call altitudes on descent.

LANDING

- Landing flap setting to prevent slush damage.
- Use reverse thrust judiciously.

PARKING & SECURING

- Use wing walkers if ramp markings are obscured.
- Taxi cautiously.
- Oil dilution requirements.
- Ice grip chocks in place.
- Release brakes to preclude freezing.

AQUAPHILIA
AQUAPHOBIA

Eight minutes before the accident the weather was 300 feet scattered, estimated 700 feet broken, 2000 feet overcast, with visibility four miles in rainshowers.

The 7000 foot runway was wet.

The speed was 140 - 145 knots before touchdown.

The aircraft landed between 800 - 1000 feet from the threshold.

Touchdown was normal, flaps were raised and the brakes pumped. There was no braking action. The airspeed was going through 100 knots. The brakes were pumped harder and the engine flamed out. Speed did not decrease much below 90 knots. The aircraft ran off the runway, through wet soft grass and mud and rested tail up and nose down.

This account seems familiar. We've heard it before, with verdicts of "Pilot Error", and "Materiel Failure" or both.

Examination of all the data indicated no mechanical fault. The tires themselves told the story = "Aquaplaning" (may be called hydroplaning). "If you don't know what aquaplaning is, take heed, for whether you drive a car or plane the mess you could get into would be the same".

Rolling or skidding tires on a wet smooth surface will aquaplane when water is squirted in the direction in which the tires are moving. This aquaplaning occurs when the tire presses against the water and there is an equal and opposite pressure from the water. At high speeds the pressure of the water against the tire rises and equals the inflation pressure. Then the tire is depressed, or cupped inward, and rides on the water.

A simple formula is your guide, neglecting certain tread designs, which describes the start of aquaplaning.

$$V_1 = 8.6 \sqrt{P} \qquad (1)$$

where V_1 = lowest velocity, in knots, at which aquaplaning will begin, and

P = air pressure in the tire in pounds per square inch.

Aquaplaning will start at V_1 knots or at any higher velocity and will continue until the conveyance slows down to roughly 15% below V_1. This is also dependant on tread design but 15% usually fits aircraft tires since those least likely to cause aquaplaning are used.

The full aquadynamic pressure developed by giving the squirting water a velocity equal to the running velocity is apparently not available for the initiation of aquaplaning. Some of the energy of the supporting water film is used up in the development of hysteretic heat which causes the peculiar melted surface of the tire. There is usually only one such spot. Experiments show that the pressure available to initiate aquaplaning is equal to 0.7 of the fully hydrodynamic pressure and equation (1) incorporates this factor.

The end of aquaplaning is described by the equation.

$$V\ (Min) = 7.2 \sqrt{P} \qquad (2)$$

Aquaplaning will continue at velocities lower than V_1 once aquaplaning starts.

The factor 0.7 becomes gradually inoperative by approaching the value of one with decreasing velocity. The thickness of the supporting water film increases with decreasing velocity and the tire becomes farther removed from the influence of the runway surface. Hysteresis of the rubber ceases to effect the equilibrium as aquaplaning stops. If the brakes aren't on, the tire begins to revolve. If the brakes are on, the spot already melted by aquaplaning gets scraped on the runway and the bottom of the tire may be further abraded by skidding even to the point of complete failure.

Tire pressure is a factor in considering prevention of aquaplaning. Figure 1, equation (1) shows that if a tire is moving at 140 - 145 knots the pressure must be 290 psi to prevent aquaplaning. In the case cited, the tire pressure was 158 lb/in^2 and according to equation (2) this tire, once aquaplaning, would not stop until 90 knots or less was reached. The ultimate high pressure of a tire is limited but the importance of maintaining the correct tire pressure is very evident. Similarly equations can be derived specifically for cars. However, the figure shows the aquaplaning of a car tire could start at 43 knots (48.4 mph) if the tire pressure is 24 lb/in^2 and continue to 35 knots or 40 mph.

Tread design is another factor in aquaplaning. The best design for avoidance are plain continuous tread grooves. The number is of course limited due to other factors.

The surface texture of runways apparently has little effect on the speed at which aquaplaning begins at velocities above 90 knots. A smooth sand or rough aggregate finish of asphalt appears to give better coefficients of friction than concrete surface below 90 knots.

Tires which are aquaplaning do not rotate, or if turning, when aquaplaning starts, will stop rotating. This explains why there is usually only one melted spot on the tire. Braking is not effective or are devices such as maxaret units which normally prevent tires from locking, since tire rotation has already been forced to cease. Brakes should be off so that the tires can spin up to avoid 100% skid when aquaplaning stops (remember less than 60 feet of skid can take the bottom off a tire).

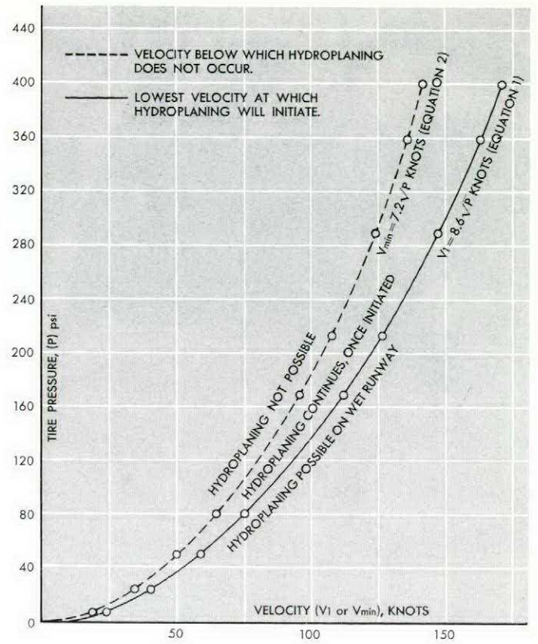


FIG. 1. RELATIONSHIP BETWEEN HYDROPLANING VELOCITY AND TIRE INFLATION PRESSURE. (TIRE TREAD DESIGN NEGLECTED.)

Gentle even pumping of brakes could give the desired effect, once tire rotation restarts.

In the absence of suitable provisions for preventing aquaplaning the following guides are essential:

- Immediately determine if runway conditions are such that aquaplaning can occur.
- Make positive contact with the runway to delay or avoid aquaplaning.
- Make maximum use of aerodynamic drag to reduce speed below aquaplaning velocity.
- If aquaplaning is evident slight bouncing of the aircraft may help.
- If necessary, overshoot, while speed, power and runway are still available.

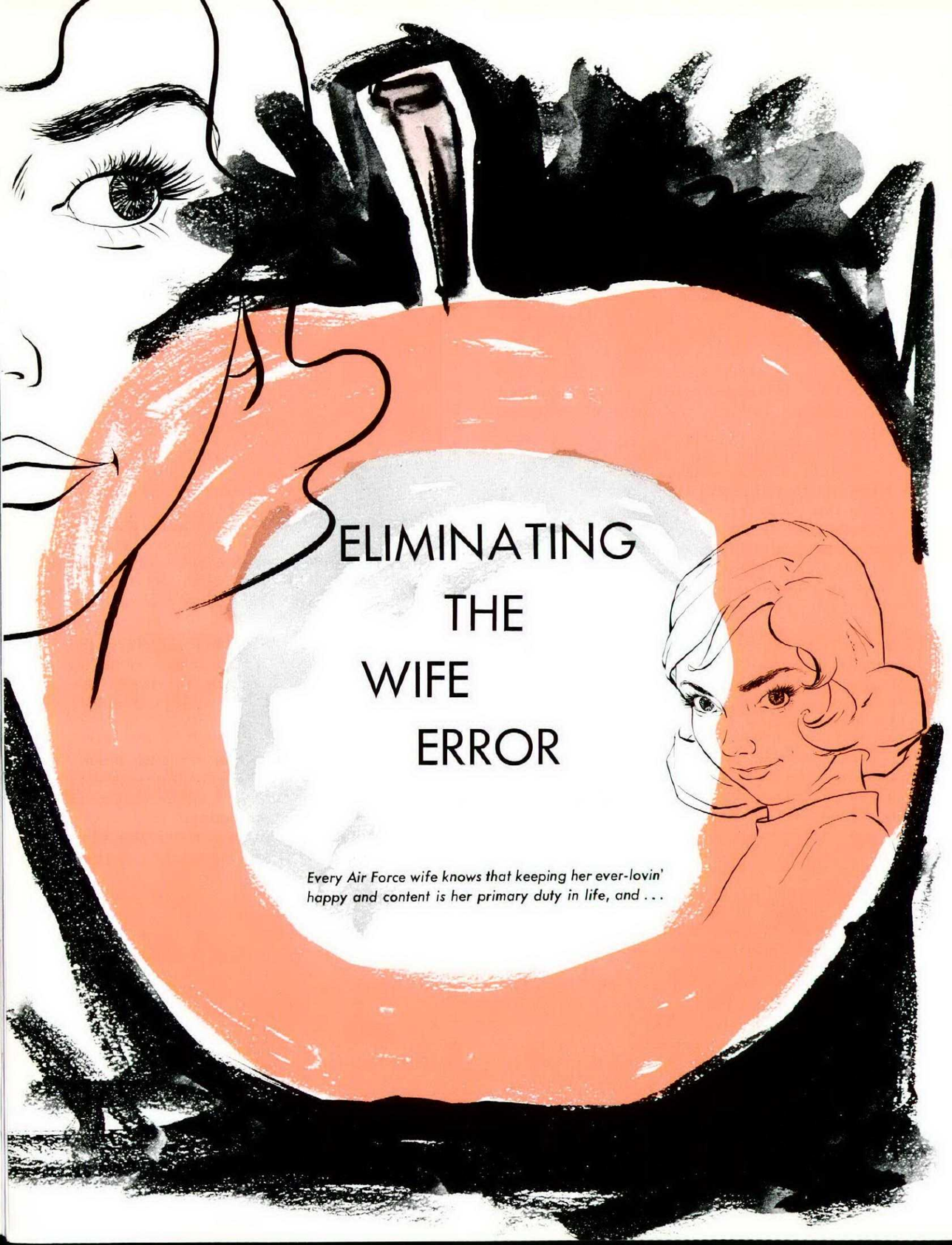
Avoid Aquaplaning Your Car

Aquaplaning instability in a car is easily detected by the feel of front end floating and apparent drag in the rear. Any positive movement of the wheels or braking will put you in a spin. Avoid the critical aquaplaning speed or gently reduce speed below the minimum critical velocity for aquaplaning.

About the Author

Paul D McLean is Chief Chemist at the RCAF Materiel Laboratory, Rockcliffe. During the war he was a flight engineer on Lancasters from 1943 to 1946. After graduating from Acadian University, Wolfville, N.S. with a Master of Science degree in 1951, he came to his present position.

The data for the article is based on the work of TR Griffith, Section Head in charge of the Rubber Laboratory of the Applied Chemistry Division of the National Research Council, and his staff. The information was obtained during the investigation of an aircraft accident in conjunction with the RCAF.



ELIMINATING THE WIFE ERROR

Every Air Force wife knows that keeping her ever-lovin' happy and content is her primary duty in life, and . . .

....that any additional duties thrust upon her, such as birther of babies, pumper of bicycle tires and dispenser of meals, medicines and money, are strictly her own puddle of mud and fer gawd sakes don't splatter Hisself with family problems, particularly before he hits the blue. And if this were fact instead of wishful fancy, all Flying Safety Officers could retire to Peru and raise wart hogs.

Since it has long been the contention of Flying Safety Officers that preoccupation with family problems oftentimes causes upset aviators to bend or even bust their birds, which in turn causes everyone from the Commander to the guard at the gate to get in a royal snit, it is obvious that something has to be done to eliminate the chain reaction resulting in "pilot error", or if you prefer the more honest term, "wife error."

And since it is impractical to abolish all existing MATS marriages, and wives will innocently or otherwise continue to muddle up Hisself's mental state before, after and during missions, it is suggested that a mandatory indoctrination course be held for wives of all flying personnel, briefing them on the hazards of hubby's home life, with particular stress placed on the importance of Twelve Hours Twixt Fight and Flight. Naturally, this course should be taught by a highly qualified instructor —someone with years of intimate knowledge and experience in creating these hazards...me, fr' instance.

Having been a veteran Air Force bride for seventeen years, I have been thoroughly orientated, indoctrinated, inoculated and regulated in all things military...I wear white gloves through receiving lines; I demand crew rest after birthings; I medicate my family with the standard Air Force prescription of APC's and orange juice for every ailment from vertigo to obese ear lobes; I have never driven a Follow-Me jeep into a parked aircraft; and above all, I keep a calling card tray near the front door—where it seldom collects anything but cigarette butts, flight lunch can openers and balls of rug fuzz. The important thing is, it's there.

It seems that in spite of this excellent Air Force training and background, I find that as a perfect wife, I ain't much. I find this, thanks to the snide remarks of a Flying Safety bohunk whom I shall bite in the neck at the first opportunity. Now, I'm actually aware that Hisself should go beanless before a mission, but how was I to know that rutabagas are lethal? There's not one word in the Flying Safety Manuals concerning rutabagas! It seems that rutabagas cause Hisself's gastric juices to over-gast something fierce, particularly when he's shooting landings; and the high cholesteral content riles up his fatty tissues to a fare-thee-well, also particularly when he's shooting landings and when these two evil forces collide in or around the old gump's pituitary, well...all hell breaks loose. And because of this slipshod oversight by Safety Manual Writers, one airplane is AOCP for a year, the runway is undergoing extensive repairs, and a mangled RB-50 tire now reposes in my living room as a plastic covered hassock.

Aside from being responsible for the home menu hazards, there's no doubt that we wives are held accountable for the daily problems of marital bliss that mayhaps miff an aviator to the point of being a potential wing-buster. Contrary to popular opinion, Hisself does not become a snarling beast only when his flaps won't flap, or his rudder won't rudd, or he wasn't promoted when he by-gawd shoulda been...no, these routine problems don't put our Sky Kings into an accident-prone mental state.

Actually, it's the little things that cause Hisself to come unglued...which is why a wife should always check the flight schedule before she indulges in an indignant account of why she turned the hose on the Base Commander's wife this morning and just who does she think she is anyway! And say did I mention that Junior stuffed a prune up his nose and don'cha know that he won't get that scuba diving scholarship since no one can scube with a maimed nostril and my gawd that bank should oughta hire bookkeepers who can add because we can't possibly be overdrawn THAT MUCH.

And many a wife has been the cause of a feathered engine or, at the very least, a kinked relief tube, because of her unguarded reactions to Hisself's blue funks, which usually develop in every normal husband at two critical periods of the day--breakfast and dinner. Although the dinner hour at our house has all the serene atmosphere of the Dempsey-Firpo fight, ("git

yer elbows off the table, don't eat so fast, clean yer plate, my-gawd this kid will be eating with his fingers when he's thirty-five years old, git the cat off yer lap..."), I would say that of the two, the breakfast hour is the more critical period.

This is when, if we wives are to be instrumental in keeping the accident rate down, we must repress the overpowering urge to clout our roommates with their jump boots when the pre-dawn conversation consists of, "and what cooking secret do you use to make these eggs taste like Ben Hur's old sandals" ...and/or "my, my dear--you look about as sexy as a stopped-up sink in that flannel puptent." Husbandly remarks such as these are usually the signal to square off and have at it. But to insure a tranquil pre-mission mental state in your sky-jock, remember to say absolutely nothing. Indignant rage and revenge can be subtly expressed in other ways...possibly you can jam all the zippers on his flight suit or go retch on the seat of his Lambretta.

It goes without saying that family problems occurring during an extended TDY have caused more than one airplane driver to come nose to nose with an unexpected object--like a mountain.

This is a period in his life when he must be spared all worries other than will he win at bingo tonight and how soon can he get an R & R to Waikiki.

Naturally, a long TDY is a bucket of worms to the wives left sitting on their hassocks, and unless Hisself pacifies the little woman with more letters than a once-a-week note, (usually as romantic as the daily bulletin and as short as commissary hours), she will discard all efforts at morale building and manage to let him know that simply because he's three thousand miles away he needn't think that kids, mumps, fights and bills don't still exist fer heaven sakes and a pox on your mental state and what about mine!

Although many a TDY wife is blessed with a husband who, though he reads fairly well, doesn't write, and has often wished that her roving roommate was as prompt and eloquent in writing love notes as he is in filling out his per diem voucher, it is suggested that she refrain from penning any epistle to her absentee aviator that might possibly result in violent chain reactions. Since crippled aircraft beget Commanders into snits; snitted Commanders begat the nervous dizzies in pilots; the nervous dizzies is what begot Hisself into this damned mess in the first place, and all on account of I wrote him the following letter:

Dear Pen Pal:

Will answer your note of three weeks ago before I get dressed for work. Oh yes, I've taken a job to occupy my time while you're away...the pay isn't much but ZOWIE!! is it interesting! I'm a BOQ Housemother, 8 p.m. to midnight shift.

By the way, did I tell you that our dog is at the Vet's? No, he isn't sick; he's under quarantine. He bit that Air Police Honcho--the same sorehead who gave me a speeding ticket and suspended my driver's license last week when I accidentally ran through a stop sign during retreat in front of Base Headquarters and plowed into a staff car sporting a monogrammed flag the size of a bedsheet. No serious injuries, except to one fella...he looked sorta like your Wing Commander but it was hard to tell with all that blood on him. Come to think of it, it just might've been. Oh well, whoever he is, he sure has a temper!

I won't bore you with the rest of the details --except to say that the damage to our car was slight. Four hundred dollars will fix it up as good as new...which reminds me, the last check I wrote seems to have bounced and I guess that's the reason your name was put on the Control Roster.

In closing, let me reassure you that everything is under control here at home and no need for you to worry. Fly safe and keep in touch, pal.

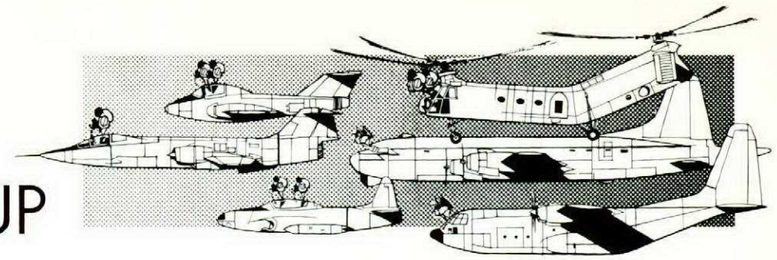
Your ever-lovin' wife

P.S.....Whaddya know! It was your Wing Commander.

Like I say, something has to be done to eliminate the "wife errors" resulting in accidents. And it is to the everlasting credit of one particular Flying Safety Officer that he tried to do his part in preserving the accident -free record of his outfit. However, because of his devotion to duty in attempting to erase "wife errors", the poor bohunk was medically discharged with unusual injuries...neck bites.

Actually, the only solution as I see it, is to eliminate the basic causes of "wife error" ...husbands, fr' instance. Without the old gumps, the problem would be solved and Flying Safety Officers would become as obsolete as promotions and Sam Browne belts.

Mrs Glenn A (Jackie) Starmer
MATS Flyer



HEADS-UP

F/O WJ SULLIVAN

F/O WJ Sullivan, an instructor on Harvards at Moose Jaw, was on a routine clear hood dual review trip. A series of stalls, spins and clear hood sequences were carried out by his student without incident. Just about the time he started a pre-spin stall check it was noted that the carburetor heat control would not move back more than about one inch and at 8,000 feet the aircraft began to run rough. Fuel was immediately switched from left to right tank, an FMS check was completed but carburetor heat would not go to the hot position. All other temperatures and pressures were normal. Oil pressures was 50 psi which seemed acceptable for a rough running engine. F/O Sullivan took control, headed for Buttress and declared an emergency. He advised that he was trying for a straight-in but did not think he could make it. Power could not be advanced beyond 15" without the engine running too rough to obtain power. RPM was left at 2000. Once during the descent the RPM was indicating 1300 and the carb air temperature rose to 150 degrees. Oil smoke was in the cockpit and the student was advised to stand by with the fire extinguisher.

F/O Sullivan continued calling Buttress giving his position and intentions. It was obvious that they were going to be short of the runway so a summer fallow field slightly off to the right was picked and Buttress was advised. A wheels-up approach was made at 90K and touchdown was at 80K or slightly less. All switches and fuel were shut off in the front cockpit. The instructor and pilot abandoned the aircraft immediately.

The accident was assessed as "Materiel Failure", the exhaust valve housing of number four cylinder was broken. This was the cause of the rough running and the jammed carburetor heat control was only coincidental. The pilot did a very commendable job under adverse circumstances and Flight Comment is pleased to include F/O Sullivan in our "Heads-Up" column.

OFFICER CADET JR HUMBLE

Officer Cadet JR Humble at Moose Jaw was at the end of a one hour solo trip on Harvards and was doing circuits and landings. On climb-out after the third landing the engine began running very roughly accompanied by a considerable loss of power. The student declared an emergency and turned towards the airfield. His first selected runway was occupied by taxiing aircraft, so he switched to another and made a successful forced landing.

The cause of the incident was assessed as "Materiel Failure". Considering the officer cadet's limited flying experience he showed considerable skill and judgement in completing a successful forced landing on the runway. Flight Comment is pleased to include Officer Cadet Humble in our "Heads-Up" column.

ARRIVALS and DEPARTURES

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

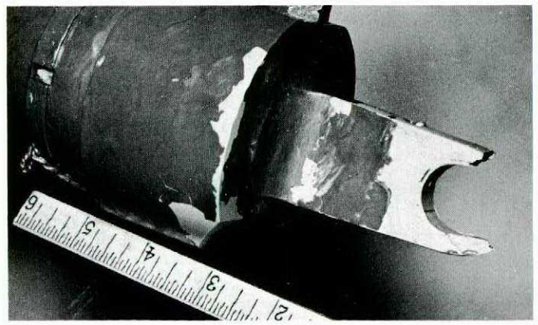
FLAW IN THE UNDERCARRIAGE SYSTEM

A pilot was flight testing a CF101B. During a 'CSL' check, at 15,000 feet, airspeed at 450 K IAS and "G" loading plus 3.5, the undercarriage horn sounded, indicating the wheels in an unsafe condition. The pilot immediately retarded the throttle and the speed brakes were selected out. A very loud thud was heard from the vicinity of the nosewheel well.

The pilot reached for the undercarriage handle and found it in the partially down position. As speed reached 300 K IAS and with no undercarriage lights evident he selected the undercarriage up. Due to complete utility hydraulic system failure, the undercarriage remained in the partially down position. He then lowered the undercarriage by the emergency method. A T33 in the vicinity reported all looked safe and there was no apparent structural damage. The aircraft was then landed smoothly with no further problems.

In this incident the pilot showed considerable skill in making a smooth landing without flaps and using a minimum of runway. Had a rough landing occurred it is possible the nosewheel would have collapsed as it was later discovered that the nosewheel lock was badly damaged. The pilot, however, erred in selecting the undercarriage up after the accidental lowering; this could have caused the undercarriage emergency lowering system to become inoperative. The possibility of hydraulic line fractures in a case such as this is high and it is fortunate that the up hydraulic line fractured, not the down line.

The cause of the accident is "Materiel Failure" and a modification to undercarriage systems has been made to prevent recurrences. Pilots have also been briefed, that in the event of an accidental lowering the undercarriage is to be left in the down position to prevent the possibility of wheels-up landing.



WHOA-BOY

A helicopter pilot was on an authorized training mission practising quick stops into the wind. At 60 K, after climbing 50 feet, he started to flare and was just about stopped when he could feel himself sinking. He started to recover but a sharp bang and a severe vibration, followed by a rapid turn made him think he had lost his tail rotor blades. He decreased his pitch and closed the throttle but in a minute had struck the ground, moving slightly backwards and to the left and then came to a complete stop with quite a jolt, shattering the tail rotor blades.

The accident was assessed as "Aircrew Error" - error in judgement and techniques. The pilot was slow in recognizing the sink rate and evidently misjudged his height from the ground and remained in a tail low attitude too long. The temperature was high and there was little wind. As the severity of his flare increased, he should have applied more power to prevent the helicopter from sinking.

THE LAST SOLO

An Officer Cadet on Harvards at Moose Jaw had completed a dual mission in the afternoon consisting of landing, starts, spins and basic aerobatics. He was then sent solo to practice the same sequences. He took off from Buttress aerodrome, a satellite of Moose Jaw, and flew outside the flying area - about two miles, over the farm of a relative.

The Officer Cadet was performing steep turns, and possibly reversing manoeuvers similar to lazy eights or stall turns. In one of these turns the aircraft stalled after a sharp pull up. The pilot lost control and could not recover from the spin within the height available. The aircraft hit in a vertical position in a small stream and the pilot was killed in the crash.

The final assessment of this accident concluded that the Officer Cadet was to blame for the accident in that, he, as an inexperienced pilot, flew the Harvard over a relative's farm in a manner beyond his capabilities, resulting in loss of control from which he was unable to recover. The distraction of the pilot's attention by events on the ground most likely accounted for the loss of control.

(We recorded a similar accident to this one in the May-Jun 63 issue of Flight Comment - end of story - Lady and the Tiger. These two RCAF pilots were lucky--this Officer Cadet was not).

LOOKOUT!

A pilot taxied a Harvard out from the line and stopped for a brake check. He applied power to roll forward and looked left, unlocked the tailwheel and started a turn. After about a 30 degree turn and taxiing about 50' the aircraft came to an abrupt stop against a chock rack, battery cart and fire extinguisher with resulting damage to the aircraft.

This is obviously a "Pilot Error" accident. There is just no excuse for taxiing into something as conspicuous as a chock rack.

FOR WANT OF A CHECK

An Officer Cadet on Chipmunks had been signed out by his instructor for a dual trip post solo to be followed by a one-hour trip solo in the circuit. During taxi back to the hangar the instructor warned the student that the right tank was low on fuel and selected the left fuel tank on to ensure that the fuel change was made. During the pre-takeoff check the Officer Cadet recalled that a tank change was necessary and he carried this out by placing the fuel again on the right tank. The flight was then carried out for about six circuits and on the downwind checks, the contents of the left tank were checked, without reference to the fuel selector level.

On the overshoot from the sixth circuit landing, the aircraft was climbed normally at 80 knots. As the altimeter approached 1400 feet, the engine rpm began to decrease but without any missing or faltering. The cadet put the carb heat control on "hot" as he believed carb ice was the cause of the rpm drop. He then put the aircraft in a gliding attitude, in order to maintain airspeed. After a further wait of about 15 seconds, the engine had not responded further and the rpm fell completely back to idle. The magneto switches were checked all on, but by this time, the aircraft was so low that there was only time to select a field before touching down. Because of trees in the way he turned the aircraft about 45 degrees to the right into another field. He turned off the front magneto switches and pulled back the throttle; the aircraft touched down and rolled towards a fence at the end of the field. He applied brakes and the Chipmunk was stopped just short of the fence.

The cause of the accident was neglect on the part of the Officer Cadet to carry out proper and thorough fuel checks. However, we must admit he did a very commendable job on the forced landing.

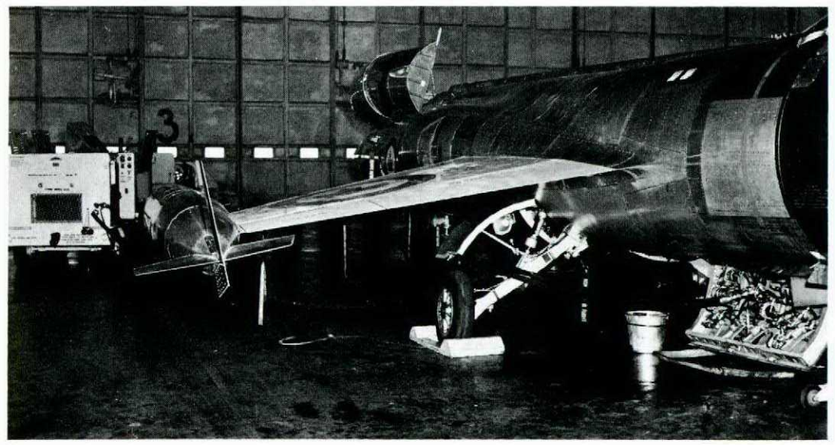
ON THE JOB?

An airman had been assigned to drive a shop mule which was parked in the hangar. He failed to notice that the mule was attached to a hydraulic test stand which in turn was connected to a CF104, and drove away, thereby damaging both the aircraft and the hydraulic test stand.

Prior to this incident, a corporal technician had been detailed to carry out an aircraft inspection which required the use of the hydraulic test stand. Assuming the inspection would take only a short time he left the mule connected to the stand and went on with his work. On discovering another major unserviceability, he left the work area unattended and went to the control room to enter the unserviceability in the L14.

During the corporal's absence, the airman having been assigned to the mule in question, went to the area and drove the mule away without noticing it was connected.

The primary cause of the incident was assessed as "Groundcrew" - personnel carelessness - failure of the airman to ensure that the mule was free before starting the engine and driving away.



LETTERS TO THE EDITOR

Burrow Three,
Infield,
RCAF Stn Bendum.

Dear Editor:

Since I belong with a group of worms living on an airfield, and on an RCAF one at that, I am naturally interested in the flight safety business and in a parallel cause—worm safety, with the idea of protecting our earthworks from the airworks as it were.

So—I would refer you to a report recently published that discusses worms and some of our habits—but only some of our habits you will note. And I emphasize this because we worms are aware that not all our activities are understood or even appreciated by you chaps.

But first to establish how the report got around in the first place. It's all tied up with the problem of bird strikes on aircraft, and how to discourage these types—we call them "Gulpies" by the way because of their appalling eating style—from living on and around airfields, and how there might be fewer gulpies if there were fewer of us chaps to draw on as rations. I like the term "draw on", it sort of describes the table manner of these characters when they get us for the main course.

Now, the report notes, among other things, that after a spell of rain, we worms leave our places of residence because said residences get a bit waterlogged—like as though our basements get flooded. Fair enough, but don't knock us on this one, because we know for a fact that some of you guys are paying around a hundred and fifty bucks a month for the privilege of enjoying the same troubles. And, the report goes on, once out, we tend to wander about, get on to the runway surface and from there we sort of lose our bearings and get lost. Again Mr Editor, don't knock us--there is a parallel I could use here but in the interests of friendships I won't bring it up.

The fact is, you might often see us moving around far from our homes but it doesn't mean we are lost. For instance, Irma and me, (you'd like Irma, the boys call her Irma the Squirma and believe me, it's a joy to see that kid go) well we often take a wriggle over to one of your messes to watch T.V. We like most of the programs and we even like one of the commercials, it's a chewing gum ad with a catchy jingle, sort of a favourite with us. But what I wanted to lead up to, is a part of the report that suggests a spray to be used to make us unattractive to birds. Now, this sounds good and we'll back the idea right to the hilt; by all means lay on a spray parade, and we'll be there—but—and this is important—we want some assurance that the spray won't make us unattractive to each other. We like each other as is, and after watching the T.V. ads and seeing how you types carry on with your washing, soaping, showering, shampooing, gargling, deodorizing and all, just to make yourselves nicer to be with, well! Only last night Irma turned, as we worms sometimes do, and said to me. "You know Willie, after watching all that I'm glad I'm a worm!" Right away I threw a couple of loops around her and told her I too am glad she's a worm. Like I said, we take each other as is. You should try this approach. Believe me, it sure takes the worry out of being close--and it can save you money too. Anyway, see what you can do about this spray angle--the very thought that Irma might find me unattractive just makes me writhe. And in any case, we worms do our bit you know, turning over the land, and grubbing around in general. And as a well-known Italian once said: "A worm in the land is worth two in the spaghetti".

But what we liked most of all in the report is the idea of building a little fence, 2" to 6" high, intended to keep us off the runways--yes, the idea is good, very good--but don't stop at six inches, make it six feet. And strong enough to stop an aircraft. Now you can see I'm thinking about flight safety, and worm safety--killing two birds with one stone, as it were--that's a favourite saying with us by the way. Not only would the big fence help you guys to stay on the runway but it would keep you out of our real estate. And if we really wanted to get to the runway we could burrow under the fence. (And here I would refer you to an excellent pamphlet: "Burrowing for Fun and Profit" McIntosh and Mayhew--DFS, 1963).

And there's a big point against the little fence. The report says it maybe could get ingested by a jet engine--well there's certainly

fod for thought right there, and I imagine this could happen before you could say Nematology.

Like you, we have thought a lot about the bird problem, and you can count on our support on any project that will at the same time benefit worm safety. At least we could give it a whorl.

If you are down this way, drop over for a bit of splendour in the grass--but then we may be seeing you first. We're planning a protest wriggle up to Ottawa because of something we heard recently. A couple of Air Force types mentioned there are quite a few cans of us guys at AFHQ which nobody wants to open--it's liberation time, so tell the Chief to stand by.

Yours in Safety
Willie the Worm

Editor's Comment:

The movement of earthworms at airports is the subject of a serious study by the committee on bird strikes, but our correspondent couldn't resist making light of a down to earth problem. --Ed.

Dear Editor:

Reference the excellent issue of the Sep - Oct Flight Comment I would like to raise the following observations. The first article "Flight Safety in MAC" mentions and I quote "Combine this task with hours of grueling day and night low altitude flying in any weather and you get the picture of aircrews in anti submarine warfare patrol which is part of Maritime Command operations. This is not for me, you say, especially if you have been flying jets for the last couple of years".

I have been flying jets, CF101B aircraft, for the last couple of years, flying in all kinds of weather, day and night, subsonic and supersonic, and holding grueling long periods of standby alert, however I have no objection to doing a tour in Maritime, flying at 300', and I am sure that these thoughts are shared with many pilots, who like myself, are now flying a desk.

Also the picture on page 24, ground collision between T33 and Dakota is rather confusing, could it be that it is printed upside down and reversed?

(JW Stants) F/L
ADCHQ

Editor's Comment:

You're right about the picture. -Ed.

Dear Editor:

Many thanks for your letter....in view of your interest, I am enclosing a copy of September's issue in which we reproduced "the Word...." I've also scrounged copies of our previous two works for you to catch up on our trends, and I've put you down for a copy of future issues (one of our precious 500 per edition).

"The Word...." made an impact beyond R.A.F. Germany, for I've just received September's "Air Clues" (from D.F.S.) and they are carrying it too though translated into English for the sake of illiterates. Perhaps Flying Officer Faulds should have taken out copyrights!

S/L Jack Stirrup
RAF Germany
(Second Tactical Air Force)

Editor's Comment:

S/L Jack Stirrup edits another magazine called "Flight Comment" which is produced by Second Tactical Air Force, RAF Germany. He originally wrote to say that he was reprinting F/O Jack Fauld's article "The Word the Book and the Yik" and also queried us as to who adopted the name "Flight Comment" first. As we changed the name of our magazine from "Crash Comment" to "Flight Comment" January 1955, we beat him by a year. --Ed.

Dear Editor:

The last paragraph in the "Double Trouble" story on page 23 of the Sep-Oct issue of Flight Comment has probably raised the blood pressure of a large number of us in the ATC branch.

A controller at a busy station has his hands full sorting out air traffic without being handed the additional chore of thinking up witty remarks designed to move lethargic pilots to lower the gear in their aeroplanes. Equally important is the fact that when you give anyone -- aircrew or controllers -- carte blanche to ad lib on standard RT patter, you open the door to misinterpretation, confusion, and accidents.

Any pilot who lands wheels up twice in one week is in need of help. But the controller has his hands full flying the tower and is much too busy to reach into the cockpit and lower the gear. That is strictly up to the pilot.

(JC Newell) F/L
RCAF Stn Chatham NB

Touché -- Ed.

Contributed by: S/L J. REGAN—DFS

THE BANG-TAILED BOOM-BASHER

This agile bird is attracted by any congested area and is inclined to be aggressive and independent when choosing his roost. Although he may be seen in all seasons, he is particularly active in winter and has shown a marked affinity for snow banks which lovers of the species often thoughtfully provide for him.

CALL: LOTSAROOM LOTSAROOM LOTSAROOM

ROGER DUHAMEL, F.R.S.C., Queen's Printer and Controller of Stationery, Ottawa, 1963

THE S-TYPE SCAN TECHNIQUE IS WHERE THE OBSERVER OR PILOT SCANS ALONG A HORIZONTAL LINE NEAR THE TOP OF THE VISIBLE AREA, MOVING THE HEAD AND EYES SLOWLY FROM ONE POINT OF REST TO ANOTHER, THE DISTANCE BETWEEN SUCCESSIVE REST POINTS BEING ABOUT 10°, AND THE DURATION OF EACH PAUSE 1 OR 2 SECONDS. AT THE END OF EACH HORIZONTAL SWEEP, THE LINE OF SIGHT IS DEPRESSED OR DROPPED 10° TO 15°, AND THE SAME PATTERN IS REPEATED BUT IN THE OPPOSITE DIRECTION TO THE PREVIOUS HORIZONTAL LINE. IN THIS WAY A RELATIVELY LARGE FIELD OF VIEW CAN BE COVERED IN 10 TO 30 SECONDS, DEPENDING ON THE SPEED OF THE SCANNING. THE CHOICE OF SCANNING SPEED DEPENDS ON THE EXISTING CIRCUMSTANCES, WHICH MAY CALL FOR CAREFUL COVERAGE AT THE EXPENSE OF SPEED, OR FOR FREQUENT SWEEPS WITH SOME SACRIFICE OF ACCURACY.