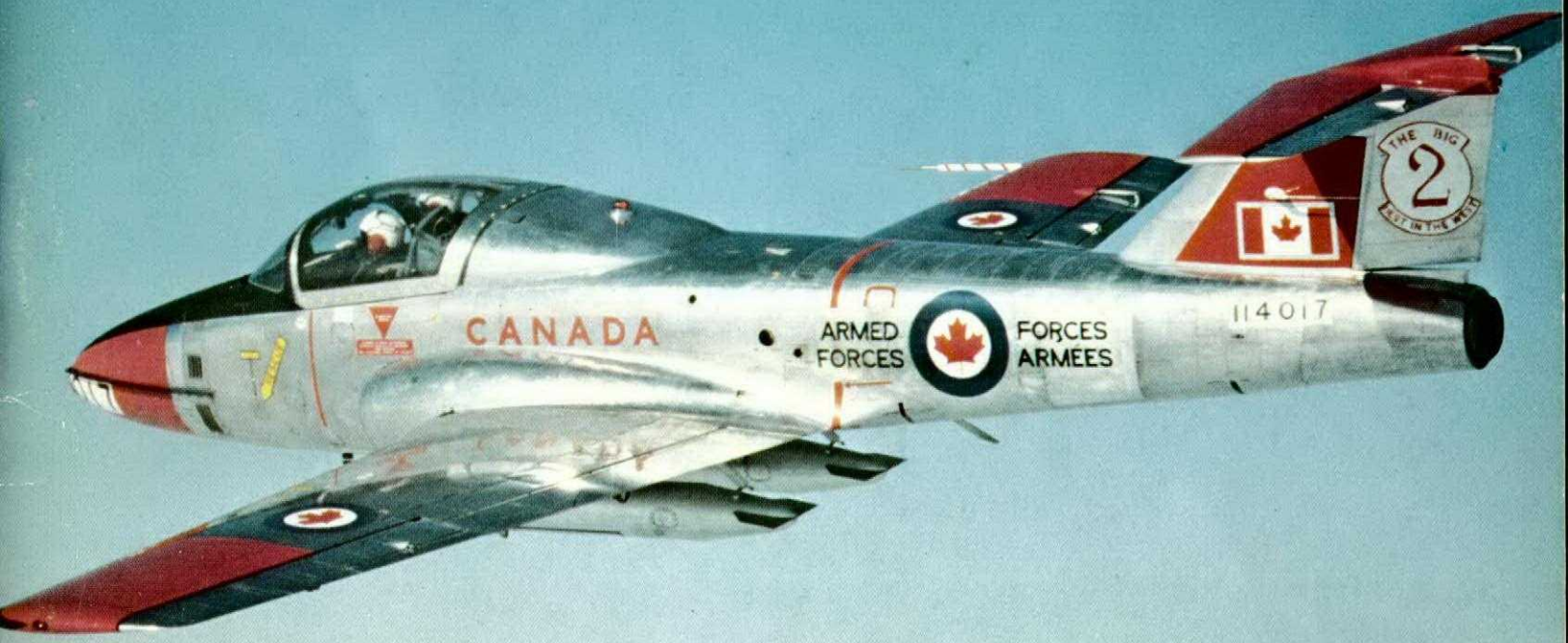
FLIGHT COMMENT

THE FLIGHT SAFETY DIGEST OF THE CANADIAN ARMED FORCES

EDITION 2 1978



ACES UP THE TAILPIPE

by Lt D. Swanson
410 Sqn, CFB Bagotville

How do you run a flying operation without having any accidents?

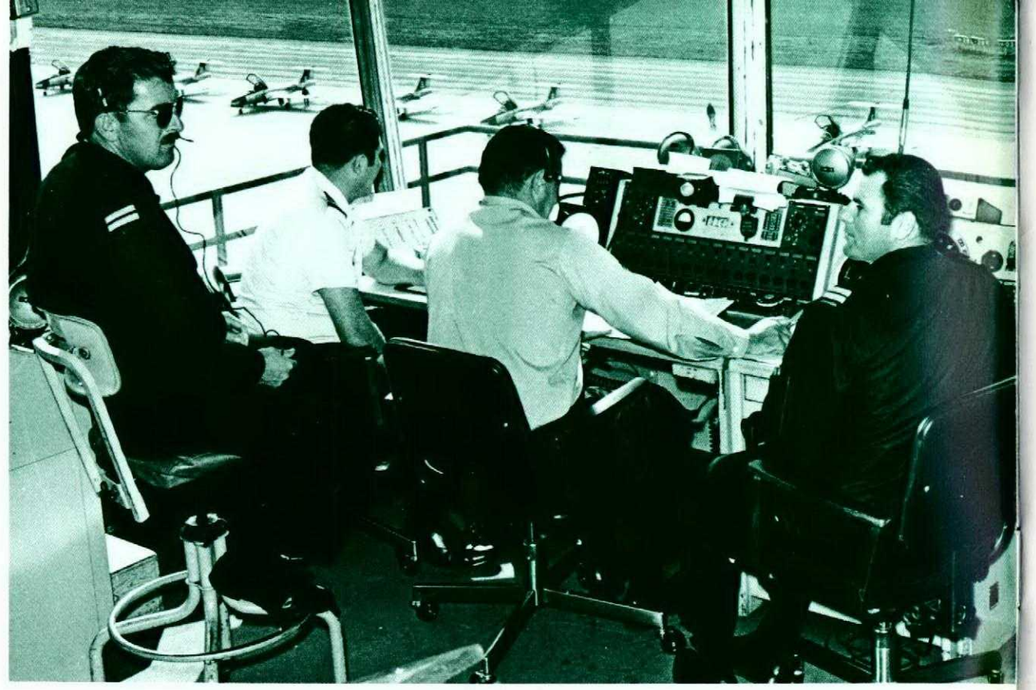
You lock all the aircraft in the barn except one, and that one you bring out only on sunny days and you let each pilot in turn go flying with the Base Commander while the Base Flight Safety Officer watches from the tower through binoculars.

Ah yes, perhaps I should be more specific; how do you log over 44,000 hours by 300 pilots (whose experience ranges from 15 hours to several thousand) all year round, all over the North American continent and maintain a zero accident rate?

I personally would suggest investing in a large shipment of rabbits feet.

1963 through into 1964 saw the introduction of the Tutor into the training system and the Big 2. 1977 was the first year since that time that the Big 2 has not had a Tutor accident. This commendable achievement cannot be isolated from a good bit of luck, furthermore I am sure that the operational types will lose no time pointing out the simplicity of the Tutor and the basic nature of our flying mission. Nevertheless, 13 percent of all Armed Forces aviation, and 30 percent of all jet aviation in 1977 was done by the Big 2 – at the busiest (over a quarter of a million aircraft movements last year) military base in Canada, and all this without an accident.

There is no denying that luck plays a part in any flight safety record; bad luck when you have accidents and good when you don't. Very seldom is an accident attributed to only one cause factor, in fact more often than not, the flying accident is the climactic result of individually minor events which through the worst kind of luck combine to affect one mission, one crew, and one machine. Chances are that black smoking hole between the runways would still be pushing up grass if only one link in the chain of events, which brought about the crash, had been missing. Many of those possible events, bird strikes for instance, are purely a hit and miss proposition, (if you'll excuse my poor pun) but the fact that the aircraft was in the air, at low level, during a period of predictable high bird activity is an example of an accident ingredient which we mere mortals can control.



It is quite easy to describe the aviation business as a gamble at the best of times. But, even gambling can be removed from the realm of luck to a certain extent (as anyone who has been to Vegas will assure you). The river boat gambler's bet is as safe as money in the bank; he deals himself two aces, hides one up his sleeve, and draws the fourth from a marked deck. It might not be in the best interests of my career to start drawing comparisons between the Commandant of the Big 2 and a river boat gambler; however, both these men practice a risky profession which they do their best to control.

The river boat gambler has his ill-gotten gains at stake and is counting on his four aces to win. The Commandant of the Big 2 has the lives of the people under his command at stake and is counting on the four aces of accident prevention.

Awareness of the potential hazards of aviation and their avoidance is the first ace in the hand, and the formal or informal discussion of the past experiences is the best way to achieve that awareness.

Fortunately, pilots love to tell war stories, so a good deal of a new pilot's second hand experience is spontaneous. In order to supplement this however, the Big 2 allows for fourteen hours of classroom discussion for the students, as well as seasonal briefings and weekly debriefs on supervisors meeting for all flying personnel. When pilots aren't talking about flying they're reading about it. This avenue of information is not overlooked either and along with the latest well thumbed copies of Playboy etc lying about the flight lounges – the Big 2 pilot has access to all the Flight Safety magazines from France, England, the U.S.A., and of course our own. Practise emergencies are an important part of the students' training, and the "what would you do if" type question is a part of every briefing. This proves beneficial to all concerned as it keeps the correct emergency procedures at the forefront of everyone's mind, instructors included. During 1977, 378 airborne emergencies were handled by 2CFFTS pilots, staff and solo students, of which 3 resulted in individual citations.

The support roles are certainly not overlooked when it comes to flight safety here at Moose Jaw. Bad weather days

and coffee breaks are used to schedule flight safety movies and informal discussions on flight and ground safety for maintenance personnel.

ATC requires little formal briefing about airborne incidents because man for man they probably witness more of them first hand than anyone else . . . Have you ever been number ten at initial? Have you ever flown 1.5 hours and logged ten overshoots out of eleven approaches due to traffic? If you have, you probably did it at Canada's second busiest airport, which incidentally, has no Radar display in the tower, search Radar that stops turning in winds over 30 knots and PAR which can't see through rains; ATC at Moose Jaw could write books about the hazards of Aviation.

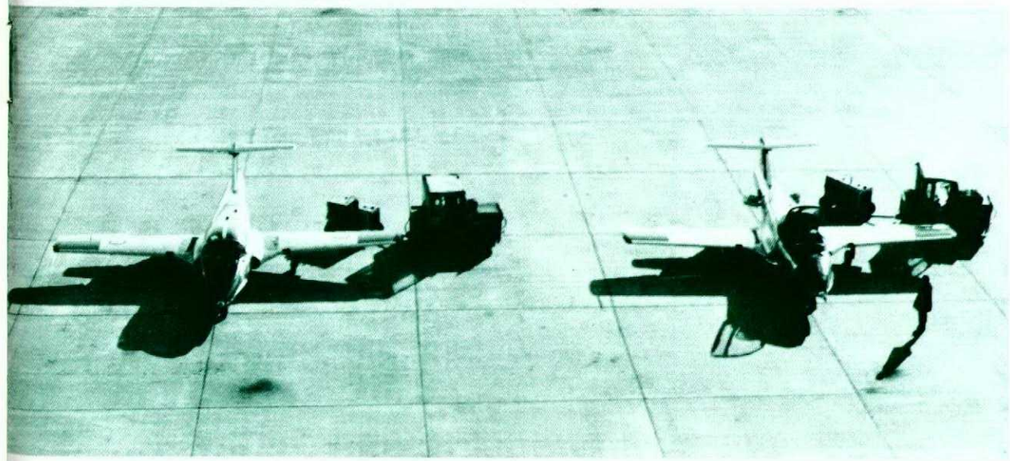
Supervision, the ace of clubs, finds it way into the Commandant's hand every time the cards are dealt. From the Base Commander on down to the Master Corporals in servicing; competent informed supervisors are essential. Regular meetings at all levels insure prompt reaction to problem areas and the timely availability of information to those who need it. An example of this would be the Big 2 weekly quarterback club which includes the bosses from all flights and squadrons within the school as well as the BAMEO, BATCO, and BFSO. Information from this meeting, such as bird counts, new recurring snags and their solution, or changes in procedure are usually general knowledge that same day.

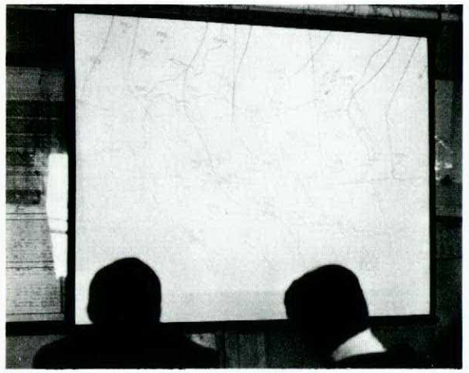
The flying mission of the Big 2 is unique and is administered in a manner which would no doubt be totally unacceptable to an operational unit.

Missions are planned in extreme detail with reference to a rigid syllabus making mission accomplishment rather straight forward. A certain element of danger has been removed through predictability, but this only compensates for the low overall experience levels of the a/c captains. Also, the training role provides its own pressures when a series of bad weather days force the school into pushing for completed trips; todays missions will have to be done in addition to any accumulated from previous days. This can lead to long working days with up to four instructional trips per instructor. Big 2 pilots log around 500 hours a year of the same repetitive flying and complacency is a very real danger.

Day to day mission planning is done by the flights in coordination with the school Ops centre. This organization employs senior instructors who determine the flying state, identify diversion fields and monitor the weather while keeping crews airborne and on the ground advised as to the latest developments. Cross country missions are submitted in detail in accordance with syllabus and school restrictions, and are formally approved at the unit and school level prior to departure. Safety is taken seriously and infractions in air discipline, when identified, are dealt with with a severity commenserate with the experience level and the culpability of the individual involved.

The *Flight Safety* network, the ace of diamonds, is the one card that no commander in the Air Force ever puts back in the deck. Along with preaching the gospel according to the DFS, the BFSO, by maintaining an efficient two-way flow of information, identifies problems and proposes solutions. Perhaps the most important part of his job is investigating





incidents and diseminating the results to the troops. There is nothing worse than having a close scrape and then not really knowing what went on other than what you did yourself, assuming you can even be sure of that.

The *individual attitude* of every participant in the flying operation is the ace of spades in this card game. There's no denying that three aces are a good hand, but the card that makes it airtight is still sitting in the deck. In order to feel confident while playing for the highest stakes in the world you have to draw the fourth ace. Only the pilot, technician and controller can ultimately determine whether he will act according to what he has been taught and what he is expected to do in the performance of his duties. The individual attitude of the people directly involved with the operation is by far the most important of the four aspects of flight safety which I have discussed, no where else can a moments indiscretion or omission bring about such immediate results.

In 1977 the Big 2 marked the cards, stacked the deck, dealt off the bottom and even bluffed a bit. In our card game the grim reaper had better be pretty lucky if he wants to take the Pot.

The enviable winning streak experienced by 2CFFTS from 14 September 1976 was tragically broken on 3 April 1978 with the crash of Tutor 114007 which claimed the lives of the instructor pilot and student on board.

Until that moment, 2CFFTS had accumulated 69,841.8 hours of accident free flying time, a record of which all involved may be justly proud.

Any accident, this one included, may be looked upon in two very different ways. Some may choose to look upon it as the end – the unsuccessful end of a difficult endeavour. Others, we hope the majority, will choose to look upon it as a fitting start point for even greater efforts.

Additional information/comments

- The actual hours flown by 2CFFTS accident free during the 1977 calendar year were 44,175.2 hrs.
- The last 2CFFTS accident occurred 14 Sep 76. From 15 Sep 76 to 3 Mar 78 inclusive, 2CFFTS has flown 65,680.5 hrs without an accident.
- During 1977, 2CFFTS has a student intake of 174, of which 155 were Canadian and 22 Dutch: 119 of the 174 graduated of which 100 were Canadians and 19 Dutch. The School's average instructor strength was 124. The reasons for student CTs, given as a percentage follow:
  - Flying, 74.5
  - Academics, 3.6
  - Medical, 5.5
  - Voluntary, 16.4
- The following 1977 ATC figures for CFB Moose Jaw might be of interest.
  - Total number of aircraft movements; 259,802 makes Moose Jaw the second busiest airport in the country.
  - A total of 24,594 instrument approaches for the year works out to be approximately 100 per working day.
  - This organization was manipulated by 39 controllers; seven tower (VFR), 17 radar control (IFR), 13 PAR; and two ground.
- The following information has been provided by the Base Aircraft Maintenance organization.
  - the average base aircraft strength was 107 for Unit Establishments (UE) of ; 95 Training Tutors, 13 Snowbirds and 3 Base Rescue Single Hueys.
  - 165 Periodic and 177 Aero Engine Periodic inspections were carried out.
  - approximately 400 aircraft with major unserviceabilities were rectified by Heavy Snags.
  - all this maintenance support was carried out by approximately 351 personnel of which currently 20% are OJT.

The author

Born March 1953

Joined regular force in 1972 and commenced flying training Dec 10, 1973.

Graduated from Course 7307 Nov 15, 1974 and after completing the F5 course at CFB Cold Lake, returned to CFB Moose Jaw as an instructor for the Big 2.

Currently posted to the T-33 utility flight 410 Squadron CFB Bagotville.

Delayed Ejection Decision

By Capt. J.D. Williams

Consider for a minute the following scenario as it applies to your aircraft type (jet engine, fixed wing, ejection seat equipped).

You are proceeding cross country on a properly briefed and authorized mission at an altitude of three thousand feet AGL and normal cruising speed when suddenly you experience a loss of thrust. What do you do?

Probably your first reaction upon sensing thrust loss is to "convert airspeed to altitude" by easing the nose up and climbing until best glide speed or relight speed is reached and simultaneously assess the cause of the difficulty and take the appropriate action.

Now lets insert a very important variable into the equation – namely ATTEMPTS TO REGAIN THRUST ARE UNSUCCESSFUL.

That should certainly focus your attention squarely upon the matter at hand – which in such an instance virtually has to be the question of self preservation.

You know from the most elementary study of the physics involved that your flying machine is going inevitably to proceed earthwards. About all you can affect is the point of impact (to a very slight degree) and whether or not you will be aboard at the time.

In the time it has taken to read this far you have zoomed, found it impossible to recover thrust, and descended to your initial cruise altitude. You have also acquired a rate of descent, however your glide speed is sufficient to negate this rate for the few seconds required for ejection – *if you fly the book speed.* This is critical because if you are below this speed you cannot level off completely and are guaranteed a downward vector of some degree if you eject. Best available figures indicate that at a minimum with a "zero-zero" seat and all other factors at optimum you will require an altitude equal to ten percent of your rate of descent for a one swing recovery from a nylon letdown. Complicate this by the probable pitchdown when you let go of the control column (trim will not always keep the nose in the level flight position) and if you're actually descending through this minimum altitude you may well have – in fact most probably have, signed your own death warrant.

Lets put the thing in the simplest possible terms. If your altitude is one thousand feet AGL and your rate of descent is ten thousand feet per minute (not unlikely in a stalled aircraft) you have a slim hope of survival if you happen to be sitting in our very best ejection seat and eject *instantly*.

Also in the simplest of terms – even if the situation is not quite so drastic – what are you waiting for? Your personal situation generally can only worsen through delay. Without getting involved in a lengthy technical discussion we can assure you that if your power source doesn't react to two or three restart attempts it probably isn't going to react to the tenth either and you may in the meantime have landed yourself in deep jeopardy through delay in that vital ejection decision.

At this time it would appear that two of our aircrew died this week because they didn't have a preplanned ejection decision or perhaps they had one and didn't abide by it.

It is simply too late when everything gets quiet in a jet aircraft to begin weighing complex variables. We think we have graphic proof of that on this page. Furthermore we have a multitude of files of parallel occurrences which lead us inevitably – perhaps we should say remorselessly to one conclusion.
"When in serious trouble – Eject"
or even
"When in serious doubt – Eject".
What About Forced Landing?

In an aircraft like the Tutor there may in some specific instances be a case for forced landing – particularly when available altitude precludes ejection though the aircraft is controlable. One must be aware of the possibility however that terrain which initially appears suitable may at the last moment reveal itself as unsuitable. Don't be sucked in. Airfield infields and overruns are one thing and rolling hills are quite another.

If you're considering forced landing simply as an alternative to ejections into a high wind situation, consider the relative risks. We have no history of serious dragging injuries although we admit the possibility, we do have a history – a sad one, of out of control contact with the ground before ejection.

Acquire for yourself a "prefabricated decision" bearing in mind all these variables. We provide for you the finest available ejection equipment and assure you that it will work if given an adequate chance.

Do not be paralyzed into total inaction by the fear that you are throwing away a serviceable machine through what may turn out to be personal error, even though you know your chances of recovery are virtually nil. Know and use the correct emergency procedures within the time available – but no longer.

Consider two recent successful (but just barely) ejections. In one instance a CF5 lost power downwind. The pilot attempted several relights before ejecting and experts in such matters agree that he just about delayed himself right into the ground. In the other instance a CF104 driver encountered compressor stalls initially at several thousand feet AGL and didn't step over the side until he was down to a very few hundred feet. A slow ejection sequence or the need for manual action on the part of either of these individuals would have terminated in ground impact without benefit of parachute.

We appreciate honest efforts to preserve our valuable aircraft, but not at the risk of human life. We are not advocating a policy of wholesale aircraft abandonment as a routine emergency measure. We are simply recommending that "When all else fails – recognize this fact – and save yourself".
Neither you nor we can afford any other course of action.

We can discuss the whole thing later, at length, over a cool brew in the Mess.

CENTRAL MEDICAL BOARD

— *friend or foe?*

by LCol John MacDougall
CDLS, Washington

You fly to live and you live to fly. The dreams of youth have been fulfilled in the arduous tasks of overcoming one anxious moment after another. First, aptitude testing; next, physical testing; then, in quick succession, ground school, solo qualifications and the last flying tests: and now you fly to live and you live to fly!

But, – each year you must prove to your peers that you still have the "smarts" to keep your ticket – *and* – prove to your medic that you've got your health! Aye, there's the rub! It's easy enough to be "bang-on-the-money" when you're making the approach with the UICP sitting in the other seat, but when you're sitting in the nearly altogether on the Doc's examining table you can't help but wonder what Sawbones is going to see that you haven't been able to.

And then it comes! – You have exotic exoticus! Is it contagious? Did you get it from your wife? Can you give it to your girl-friend?

No!

Is it curable? Will you shake it off like a bad cold and put it behind you?

No!

Is it serious?

Yes!

Will it shorten life?

No!

Can you fly with it?-?-?

Then comes the cruncher! Doc starts to waffle a bit and finally says he doesn't know for sure. –

Who does?

CENTRAL MEDICAL BOARD

Yes, CMB has been with us for many years, in one form or another, and has the responsibility of making recommendations on whether or not an aviator may continue to fly while afflicted with various medical problems. It is located in Toronto, at the Defence and Civil Institute of Environmental Medicine, (DCIEM,) – and has a three-fold mandate. Each of the three main functions has an equal weight on a responsibility scale and to speak of one before the other does not negate or minimize the remainder. Logically then, it would be prudent to consider these functions on a chronological basis in terms of a flyer's career.

As was inferred in the opening paragraphs, the ab-initio airman is required to "pass" a fairly rigid medical examination. For the Pilot and Navigator who is declared physically acceptable on the basis of his recruit medical a further battery of tests and anthropometric measurements is required at CMB. Even then, some questionable physical attributes or minor irregularities found by the recruiting examiner may be referred to CMB before a final decision is reached. CMB then, may be said to act as a "clearing house" before the expensive training program is offered to the hopeful flyer. In the discharge of this responsibility several things are achieved. A decision is made on whether the individual is physically capable of fitting into and adequately reaching the main control elements of an aircraft. As well, base-line records are obtained of the body function that may change over the person's career. Such simple things as audiograms, visual status, heart tracings and brain-wave patterns are assessed and entered into permanent record.

The second responsibility of CMB relates to assessment of the established flyer who develops a medical problem whether by accident or as a result of the normal "risks" of living. It's the sort of problem that may turn up on annual medical examination or result from frank disease. Though of no greater or lesser importance than initial assessments it is this area that brings CMB into greater focus in the eyes of the career flyer for obvious reasons. It is therefore in this perspective that CMB's function can, perhaps, be best understood.

In discharging both responsibilities the basic question, that can have only one answer, is whether the man is safe to fly, (hence the reason for this article in this magazine). The question of safety, of course is a multi-edged sword. Is he safe to himself? Is he safe for the expensive machine that has been given to his control? Is he safe for the passengers that may be flying with him? Is he a safe investment for his employer? There is no need to further belabour the obvious responses required to these inquiries.

In assessing the new recruit the factors of proposed training expenses and whether he can perform on an unrestricted basis make "safety" decisions relatively easy. On the other hand, the trained flyer, who now has some obvious and measurable assets, the decisions must be more carefully weighed. In neither area is the decision for rejection taken lightly. In the former situation the individual can be classed as acceptable or not acceptable: – period! In the latter, there is that added classification of restricted category known to all of us as A-3. (At this juncture it would be prudent to point out that referral to CMB is not a "kiss-of-death". Statistics have shown that of all those members assessed at CMB about 25% have returned to full flying duties, 50% have been awarded a restricted category, – sometimes for only temporary periods, and only the last 25% have been permanently grounded. Even in this latter group, re-assessment a few years later has allowed re-instatement of flying privileges in a few, selected cases.)

Though discussion in terms expressed in the above fashion give the obvious impression that CMB has been designed by, and can only serve its own master, (The CAF), there are other considerations that need to be understood. Regardless of what the final decision may be, it is not achieved without thoughtful and careful scrutiny in every case. To achieve the "bottom line" CMB has a battery of specialist consultants to provide assistance in assessing each situation where further investigation is required. For the most part these consultants are located in the Toronto area. Many of them hold appointments with the teaching hospitals. All of them are highly qualified and well respected in their field. It can be seen then that a very personal benefit is to be achieved for the flyer who comes to CMB as a "patient" to be further evaluated by such people. It is of further interest to note that nearly all of such consultants are members of the civilian community and are in no way obligated to The Service. Many of them have been in uniform in the past and, for those who have not, they have been associated with the flying environment for a long time. These associations have given excellent opportunity to provide critical insight into the hazards, (or non-hazards,) of disease as it relates to flying activities. Hence, consultation by these specialists has historically served in several ways. The "patient" has often benefitted by having a second opinion that has factually confirmed, – or denied, – the presence of disease, and, has further had the opportunity to discuss his ailment (if any) with the specialist and with the staff at CMB.

In this respect then, it is the welfare of the man himself that is of paramount importance. The effect of his "condition" upon his flying career comes as a secondary, – but equally important, and necessarily unavoidable, consideration. The two aspects are so closely interacting that they cannot really be separated. Obviously, in situations where a decision must be made that restricts or effectively limits a man's career, then the administrative function of CMB gains an inflated and undeserved reputation.

As has been indicated, most consultations and sophisticated testing takes place in Toronto and/or in the facilities of DCIEM. The rotating chairs, the centrifuge and the high altitude chambers are obvious "tools of the trade" that have achieved high profiles and varying reputations. Lest we be accused of providing too much emphasis to Toronto it should be pointed out that other consultants and facilities across the country are frequently approached to provide guidance in specific cases. Neurological units from Halifax to Vancouver, have been used. Complete work-ups in Urology have been requested from the province of Quebec. As many readers will no doubt be aware, heart specialists in London and Ottawa are frequently asked for their opinion and assistance. In short, much expense is often undertaken in a concerted effort to retain a flying category on behalf of the individual being investigated.

We spoke earlier of three responsibilities of CMB. The third function results quietly, but significantly, from the conscientious discharge of the first two. Since its inception many years ago as the Aircrew Selection Board and during the evolution through Central Aircrew Medical Board and despite its several changes in geographic location, a multitude of files and records have accumulated. They represent a source of Canadian experience in aircrew medical problems that, in concert with the specialized training of Aeromedical Officers in the CAF, assist significantly in the decision processes required. These files, representing some 12,000 cases or more, sobering in their number, help to maintain a dynamic activity that constantly endeavours to learn by its experience.

In view of such records it would seem contradictory, on the face of it, to suggest that CMB has no "policy" in specific cases. In reality, it is review of such documents that strengthens the policy of "no-policy". They serve to emphasize that we must not fall into the trap of rigid interpretation of physical findings and, therefore, each case that comes before CMB is carefully considered on an individual basis and judged on its own merit. After all, it is a much more expensive proposition for the service to have to lose a man than it is to keep him. CMB has therefore been established to make every effort possible to find reasons for retention rather than rejection. If it has come to be known as an adversary then it is hoped that you might recognize it as a *friendly foe*.

GOOD SHOW

CAPT M.P. JEPHCOTT CAPT S.M. MORGAN

On 25 Feb 77, Captain Jephcott and Captain Morgan took off on runway 23 at Theodore Francis Green State Airport, Rhode Island. The weather was overcast at 5,000 feet with two to three miles flight visibility. A short time after levelling off at 5,000 feet with power at 85 percent and 250K, clearance was received to climb to 11,000 feet and full power was applied for the climb. As the nose of the aircraft was brought up there was a loud bang followed by a rise of EGT and a rapid rundown of RPM.

A turn was initiated back towards the departure airfield, all relight attempts were unsuccessful and many electrical systems did not appear to be functioning. The aircraft was now over the city of Providence with no apparent place for ejection and there was insufficient altitude to glide away from built up areas.

A steeper descent was initiated in a futile attempt to attain some engine RPM for a relight when the airport was sighted in a position that favoured a forced landing on the downwind runway 05. The landing gear was lowered manually and as flaps and speedbrakes were not available the aircraft was high and fast for a straight in approach.

The further complication of an airliner taxiing toward the button of 23L and the fact that they did not know that the airport or airliner were aware of their approach prompted the decision to change the approach to runway 34. A hard right then left turn placed the aircraft over the runway about half way down the 6,042 foot airstrip. Landing was effected immediately and full brakes were applied. The aircraft came to rest at approximately 800 feet from the end of the runway.

Captains Jephcott and Morgan are to be commended for their superior judgement and skill in recovering their crippled aircraft under most difficult circumstances. Not only did they prevent the loss of a valuable aircraft but quite probably saved their lives and the lives of many citizens of Providence.

CPL J.S. SMYTH

While changing the nose wheel steering clutch assembly on Tutor 114104, Corporal Smyth, an Airframe Technician, noticed something different in the front part of the nose wheel well. Upon further investigation, he discovered this to be a new cable routed through the wheel well as a part of the recent glide slope antenna installation. Cpl Smyth suspected that this cable was in a bad position and after closer examination he found that the cable had been worn halfway through. He concluded that this was caused by the nose wheel after retraction.

Cpl Smyth immediately reported this situation to the Communication technicians and, as a result of his findings, a Special Inspection was initiated. This Special Inspection required that all Instrument Landing System equipped aircraft have this cable checked for serviceability and re-clamped to a secure position. A total of forty aircraft were subsequently repaired.

Bearing in mind that the discovery of this snag is beyond the requirement of his trade knowledge, this is a positive example of Corporal Smyth's putting forth that extra effort to ensure that an aircraft is completely serviceable. His alertness and professional attitude not only saved many manhours in the otherwise eventual premature replacement of expensive cables, but prevented in-flight failure of glide scope indication which could have dramatic implications should this happen on an instrument approach in cloud.

Cpl J.S. Smyth

Pte J.A. Hogan

Capt S.M. Morgan
Capt M.P. Jephcott

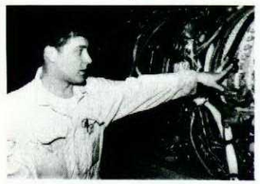
Cpl T.C. Manning

PTE J.A. HOGAN

Private Hogan, an Airframe Technician, on the job training with 417 Squadron Line Servicing, while readying a dual Starfighter for a start, discovered that the front cockpit seat harness locking cable had become disconnected. He referred the snag to a senior technician who immediately put the aircraft unserviceable. Had this situation gone undetected and the occupant of this seat found it necessary to eject, the seat harness would not have automatically locked, resulting in severe or possibly fatal injuries being incurred during the ejection sequence. Through his alertness and thoroughness on the job, even though this particular snag was not related to his trade, Private Hogan averted a potentially dangerous situation and has set an example for others to follow.

Pte W.T. Clark

Cpl C. Heidt



Cpl R. Chiasson

MCpl G.Q. Knudsen

CPL T.C. MANNING

Corporal Manning, a Safety Systems technician, was performing a post-flight inspection on a T33 when he detected a slight restriction in rudder movements as the rudder was pulled through its full travel. On checking with the pilot who had previously flown the aircraft, he was told that no rudder problem had been encountered during the flight.

Still suspecting a possible problem, Cpl Manning continued checking, eventually finding a small worn spot on the upper rudder hinge. Close examination revealed a nut wedged in the overhanging sking of the rudder. He then advised his supervisor. The nut was found to be of the type used on the vertical fin fairing.

Corporal Manning's attention to detail in an area not associated with his trade thus led to the detection of a potential hazard.

CPL R. CHIASSON

Corporal Chiasson had been assigned to disconnect the oil tank from a J79 engine in preparation for the removal of the compressor front upper casing. The engine was in the engine bay for a comprehensive examination, having been damaged by a birdstrike.

Following removal of the oil tank, Cpl Chiasson continued to assist in removing the compressor casing attachment bolts. While doing this, he noticed the absence of the pin which attaches the lever arm to the half-ring connector on the 5th-stage variable stator vane. The fact that the pin was missing permitted the vane to move freely, thereby creating the possibility of a misaligned vane which, in turn, could cause severe internal stresses on other blades.

Corporal Chiasson's professional approach to this assignment, in a detail outside his particular trade, not only averted possible further damage to this engine, but led to the discovery of a similar missing pin on another engine.

CPL C. HEIDT

Corporal Heidt was performing a "last chance" check on a CF104D when he discovered a one-and one-quarter inch long vertical crack on the right side of the fuselage below the front cockpit. The crack was in such a position that it could have been covered by either the ladder or the canopy safety pin flag during pre-flight inspections. This probably accounted for its not having been discovered during the "A/B" checks nor by the pilot on his "pre-flight".

Discovery of the crack led to the mission being cancelled and averted the possibility of the aircraft incurring further damage had it got airborne with such damage in a pressurized area of the fuselage.

"Last chance" checks are primarily concerned with detecting fluid leaks and ensuring that there are no insecure panels. Corporal Heidt's vigilance demonstrated a professional approach to his job well deserving of a "Good Show".

MCPL G.Q. KNUDSEN

While Master Corporal Knudsen was installing panels on the vertical stabilizer of aircraft 104732, a member of his crew was operating the controls to cleanse the hydraulic system for a silt reading. MCpl Knudsen heard an unusual noise coming from the area of the left aileron. Investigation revealed the noise to be coming internally from the aileron. Subsequent x-rays showed no cracks or anything unusual. Still convinced of a problem, he had the aileron and the front beam removed in order to see the internal structure. Very careful scrutinizing revealed minute cracks in one of the ribs. This was causing the cracked area to lap and produce a tin canning noise. The area was thoroughly cleaned of all paint and Liquid Penetrant Inspection test confirmed the cracks.

It was only through Master Corporal Knudsen's thoroughness, attention to detail and dedication to his duty that this potentially dangerous unserviceability was discovered.

PTE W.T. CLARK

While performing a "B" check on a Twin Otter aircraft, Private Clark noticed a strand of grass protruding from the aft fuselage section, close to the port rod assembly control for the rudder. Removal of the fairing covering the rudder bell crank revealed a bird's nest approximately nine inches in diameter. A similar check of the other CC138 aircraft on the line revealed one other nest. Both aircraft had returned from a Search and Rescue deployment where hangar space was not available. It is assumed that the nests were built during this deployment and it is significant that they had not been previously discovered by more experienced personnel during several prior ground checks. Pte Clark is undergoing OJT training for upgrading to a higher qualification.

Private Clark's alertness and professionalism have

effectively contributed to the Flight Safety Programme. While he was, in fact, carrying out his assigned task, it is considered that because of his limited experience, his detection of the bird nest was an exemplary piece of work.

CPL D.K. DENHAM

Corporal Denham, as a member of the CF104 Servicing Organization, was assigned to a start crew on the morning shift. After applying ground power and preparing the aircraft for the pilot's arrival, Cpl Denham discovered a small crack on the towing bridle of the starting unit. He then took an extra few minutes to crawl under the compressor start unit to inspect the crack further. He discovered that the crack had propagated to the extent that only 10% of the frame cross-section was holding the front wheel bridle system intact. Had this defect gone unnoticed at this time, a serious accident could have occurred, which would very likely have resulted in injury to personnel and/or aircraft damage, if the compressor start unit had broken away while being positioned between aircraft.

Corporal Denham's alertness, initiative and attention to detail in this instance are exemplary and deserving.

CPL T.M. CAREY

While performing an "A and B" check on Sea King 2401 at sea in HMCS Algonquin, Corporal Carey noticed a very fine hair line crack on the starboard undercarriage uplock cylinder assembly attachment point. Eventual failure of the attachment point during a subsequent flight would have prevented normal extension of the starboard main landing gear. This would have required the use of the emergency landing gear extension system with possible further damage resulting from the dangling uplock cylinder assembly. The subsequent loss of manhours and flying hours, in an operational exercise, during shipborne operations would have created a very unfavourable situation.

Corporal Carey's professional dedication in carrying out a more thorough inspection of the aircraft than is normally called for by this type of check, prevented a more serious incident possibly entailing hazardous and costly consequences.

MCPL W.P. STEEVES

On 15 June 1977 while performing a pre-flight inspection on Hercules 130315, MCpl Steeves noticed the left rear main tire appeared low in pressure. After re-charging the tire to its correct pressure he decided to carry out a further inspection of the wheel well area. He immediately noticed a bent lower former assembly. Upon further investigation he discovered popped rivets and extensive cracks in the skin forward of the main gear track. This damage was in a primary aircraft structure area.

Should the damaged former assembly and cracked fuselage skin have gone unnoticed, further damage could have occurred resulting in a serious in-flight hazard.

MCpl Steeves' dedication to duty and initiative, in carrying out a more in depth inspection than what is normally required, may well have prevented a serious aircraft accident/incident.

PTE D. PRAUGHT

During the routine calendar inspection of a 10-man life raft Private Praught noticed that the top chamber carbon dioxide inlet connector which attaches the carbon dioxide cylinder to the life raft appeared to be improperly seated. He removed the fitting and cylinder and then applied hand pressure on the connector. This appeared to properly seat the connector but this fact could not be confirmed visually.

Pte Praught still had doubts about the security of the connector and requested permission from his superior to inflate the life raft with a time-expired carbon dioxide cylinder. Upon inflation the suspect connector broke away from the life raft and the stream of CO2 over the top chamber caused the fabric seam to separate for a length of 20 inches. This would have made the life raft useless in an emergency situation.

Private Praught had been in the Service for only 18 months and at this Base for nine months at the time of the incident. His concern, dedication and persistence are highly deserving of recognition.

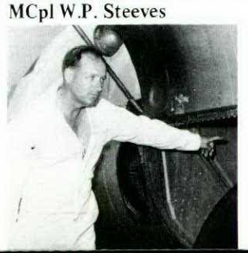
MAJ R. MERRICK CAPT J. MCNAMARA

Captain McNamara and Major Merrick were airborne in a CF101 on a night mission during 22 Norad Region Exercise Fabric Brave 77-4, 27 July 1977. While cruising at 35,000 feet approximately 130 miles North of Bagotville the starboard generator failed and would not reset. An emergency was declared, the aircraft was turned towards base and the crew reviewed the emergency procedures for a

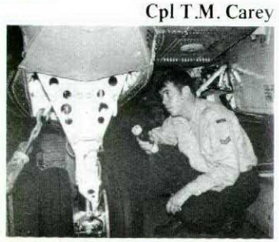
Cpl D.K. Denham

Pte D. Praught

MCpl W.P. Steeves



Cpl T.M. Carey



single and double generator failure. Five minutes later the port generator failed. Neither generator would reset in spite of numerous and rapid-attempts.

Capt McNamara elected to penetrate a medium overcast before his standby attitude indicator froze, picked his way through a lower scattered to broken layer and, keeping a wary lookout for unusually dense air traffic, carried out an "uneventful", blacked out, straight-in, full stop landing.

The knowledge of the CF101 displayed by Major Merrick and Captain McNamara and the professional way in which this emergency was handled averted, what could have easily become a major aircraft accident.

CPL J.H. HIEBERT

On 21 Jul 77, with the Base operating a heavy flying schedule, Corporal Hiebert was conducting routine "A" checks on the Tutor line. The emphasis on the Tutor servicing section was to complete all turnarounds thoroughly but as quickly as possible.

The Tutor "A" check calls only for a visual inspection of the jetpipe interior. Cpl Hiebert came to aircraft CT114067 and by grasping the still warm jetpipe functionally checked it for security. This action revealed what appeared to be excessive side play in the jetpipe assembly. After parking and turning around the next two aircraft, Cpl Hiebert, still feeling ill at ease over the jetpipe in question, returned to 4067. He conducted a closer scrutiny of the suspect area which revealed a locknut on the left hand jetpipe attachment turnbuckle assembly, which had backed off approximately one-eighth of an inch. Because of the recessed area surrounding this locknut its tightness and condition would have gone undetected had he not carried out an abnormally thorough check. At this point Cpl Hiebert summoned an AE Tech who confirmed that the jetpipe was in fact in a very hazardous condition.

Corporal Hiebert displayed true professionalism in

Maj. R. Merrick
Capt J. McNamara

Cpl J.H. Hiebert

Capt D.L. Carr
WO J. Hill
MCpl G.M. Williams

Cpl B.R. McCullough

detecting and reporting a problem that was beyond the requirements of his trade thereby averting a possible future inflight incident.

PTE N.J. LESLIE

Private Leslie is an Aero Engine technician who is undergoing On Job Training at present. While carrying out an A/B check on a CF5D aircraft, Pte Leslie noticed what appeared to be discoloration marks on the compressor blades of the right hand engine. These discolorations are frequently present on CF5 engines, however Pte Leslie felt further investigation was warranted and immediately informed his Crew Chief. The engine was further inspected through the intake but damage to the compressor could not be confirmed. A side panel was removed and by using a large light and a mirror, the marks proved to be nicks in the first two stages of the compressor indicating a seriously fodded engine. Despite his inexperience, Private Leslie recognized a potentially hazardous situation and by bringing this to the attention of his supervisor, he prevented further damage to a valuable engine and a possible serious in-flight emergency thereby making a positive contribution to Flight Safety.

CPL B.R. MCCULLOUGH

A CC115 Buffalo aircraft was assigned for student flight engineer training during a recent 426 Squadron Flight Engineer Course. The inspections had been verified complete in the Aircraft Record Set, and the flight engineers proceeded to the aircraft. Corporal McCullough, a student carried out an external safety check. He noticed a few small abrasions on the edge of the propeller blade. By running his hand along the face of the propeller, he could feel ripples on the face of the number two blade. He reported the damage to his instructor who immediately notified servicing.

Although the damage was not considered extensive enough to prohibit ground running, the aircraft was later declared unserviceable for flight. The propeller was subsequently changed.

The incident demonstrated the alertness of Corporal McCullough and the conscientious level of training the students received during the CC115 Buffalo Flight Engineer Course. His vigilance in detecting a potentially serious problem-causing defect.

CAPT. D.L. CARR
WO J. HILL
MCPL G.M. WILLIAMS

United Nations 304, a Hercules service flight from Ismailia, Egypt to Lahr, Germany, lost complete aileron control while in a level right turn at 20,000 feet. Capt Carr the Aircraft Commander was in the left seat, flying the aircraft on autopilot, when the control wheel moved rapidly to a full left deflection without reducing the right-banked turn. He

immediately disengaged the autopilot and discovered that while the rudder and elevator controls were working normally, there was no feel or response in the aileron control system. He was able to bring the wings to a near level attitude using the rudder. Although he found that he could partially control the aircraft with rudder and very cautious use of aileron trim, Capt Carr elected to declare an emergency to Athens Control, so that the crew could deal with the situation without having to worry unduly about navigation or aircraft avoidance.

Warrant Officer Hill the flight engineer was in the engineer's seat when the incident occurred. After checking that hydraulic pressures and the position of all switches were normal, and that the pilot had reasonable control of the aircraft, he left his seat and began checking the aileron control system and its rods and cables from the cockpit towards the rear of the aircraft.

Master Corporal Williams the loadmaster was listening on headset in the cargo compartment when he heard the emergency declared. He left his position and quickly checked the utility and booster hydraulic systems, reporting to WO Hill that they seemed normal. Learning that there was a control malfunction, he then returned to the rear of the aircraft and began a visual inspection. He observed that the large wheel on the aileron booster quadrant assembly was moving as the pilot moved the control wheel and noticed that there was no corresponding movement in the aileron push/pull rods. He immediately climbed up on the freight load for a closer look. He saw a disconnected rod and pointed it out to WO Hill.

The connecting rod between the follow-up arm and the aileron hydraulic boost assembly had come unfastened, negating all aileron control from the cockpit. Working together, WO Hill and MCpl Williams were able to align the rod, and as Capt Carr moved the control wheel to a corresponding position they were able to insert the bolt, which had not quite fallen free from the boost assembly. There was no sign of the castellated nut and cotter pin that should have secured the bolt in place. MCpl Williams held the bolt in place with his fingers while WO Hill searched for the missing nut. When he was unable to find it, he robbed a self-locking nut from a seat support and installed it on the bolt. After insuring that complete aileron control had been restored, Capt Carr cancelled the emergency and the flight continued to Lahr.

Captain Carr, Warrant Officer Hill and Master Corporal Williams displayed a very high degree of professionalism and co-ordination throughout the incident. In particular, Capt Carr's cool leadership and timely declaration of an emergency, WO Hill's rapid assessment and correction of the situation, and MCpl William's alertness and display of job knowledge far above that required of his position, rapidly rectified what would have otherwise been a very serious situation.

MCPL J.C. REDMOND

On 20 September 1977, while 116 Air Transport Unit was deployed to and operating from Abu Suweir Airfield in Egypt, Master Corporal Redmond, an Aero Engine Technician from CFB Comox was on duty at the Servicing Desk located in a hardened alert hangar 100 yards from the aircraft dispersal area. After start and prior to taxiing the right wing spoiler on a Buffalo aircraft was in the deployed position. Master Corporal Redmond saw the deployed spoiler and took immediate action to notify the aircrew.

Since it is very unlikely that the crew would have noticed anything unusual until late in the take-off roll, Master Corporal Redmond's alertness prevented a serious incident or accident.

SGT D. STEFANO

While conducting a routine pre-flight inspection on a CC115 Buffalo aircraft, Sergeant Stefano, a 426 Squadron staff flight engineer, noticed that the emergency air bottle was improperly installed. The bottle is attached to the right hand side of the nose gear strut and provides an emergency alternative method of gear extension.

Sergeant Stefano observed that the two retaining straps on the air bottle were inverted and facing in the wrong direction. A Caution in the CFTO clearly states that the straps must be installed with the latch side of the straps on the upper side of the bottle with the bolt stem pointing toward the landing gear drag strut. The purpose of the Caution is to prevent the strap latches from damaging the wire bundle to the nose gear weight switch during gear extension.

As a result of Sgt Stefano's discovery, a special inspection was carried out by all units operating Buffalo aircraft. Several other aircraft were found with incorrect bottle installation.

Significantly, the improper installation had gone undetected through many inspections. Thanks to Sergeant Stefano a potentially hazardous condition was corrected.

MCpl J.C. Redmond

Sgt D. Stefano

VISUAL ILLUSIONS ON LANDING

by Maj C. Crymble, DCIEM

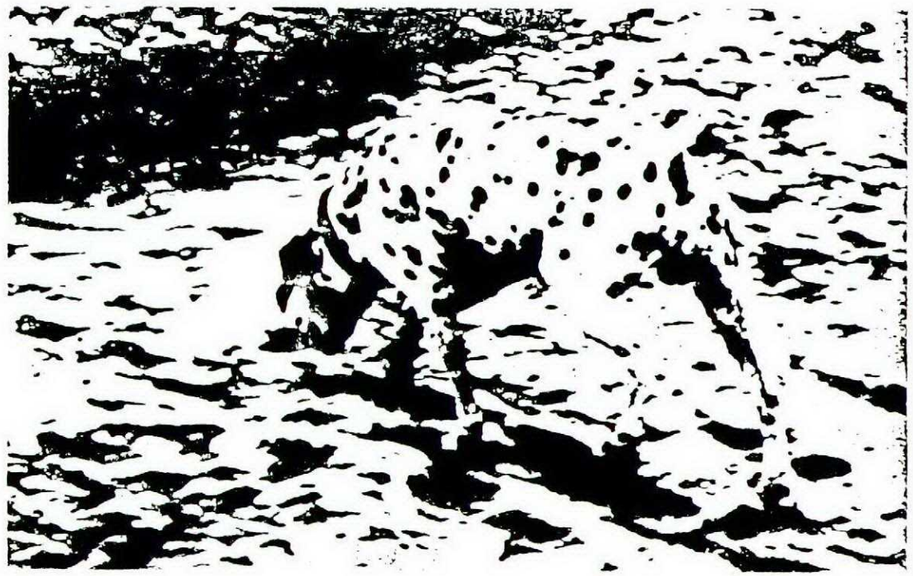
Seeing is believing, but seeing can also be deceiving. For example, have you ever been in the position of admiring a beautiful looking long-haired blonde from a back view, to discover when she turned around, that she had a face which could "stop a clock", or worse, that "she" was a guy! That is an example of a misinterpretation of what you saw and could have led to an incorrect approach and possibly disasterous results.

Pilots can also misinterpret visual cues when flying, which can also lead to a disasterous approach. Visual perception is in essence, a comparison of visual images received each instant with recalled past visual experience. The sight of long blonde hair could prompt the perception "girl". The sight of a line of lights might prompt the perception horizon when in actuality, it is a road running at 45^{0} to the horizon.

On the approach, the pilot instant to instant, is continually comparing incoming visual signals through a complex photochemical and neurological process with past experience to resolve his orientation in space. A misinterpretation of the visual signals which could occur when the pilot encounters unusual topographical features, reduced lighting conditions or degraded visual reference, could result in an illusion which might persist because the required visual frame of reference cannot be readily established. The whole process of seeing, from the one extreme of viewing a blank visual field (fog) to recognizing shadows, to identification of objects, is a complex learning process. Of course, you don't have to see the whole object to recognize that object, a glimpse of a line of lights and the diagonal bars painted on the runway threshold, is enough to prompt perception of "runway". The shadow picture below should be recognized by most people immediately.

In addition to the recognition of objects, the interpretation of what you see into a correct assessment of your relative position to the runway threshold is another visual function which can create illusions. The fact that what you see and assess is not always true, is illustrated by the following familiar illusions: –

Bringing these visual failings to the problem of maintaining



a correct approach can firstly be related to the image which the pilot was trained to expect of the runway at certain distances out on his approach. The pilot may for example assess his altitude and distance from the threshold, from experience, from the following runway image to be 500 feet and two miles.

This image plus ground cues – trees, buildings, etc. give him, when compared to his past experience, an accurate assessment of distance and altitude, but suppose that he was not approaching his normal airfield which had a 150 foot wide runway, but one with a runway which was 300 feet wide. If he was depending on runway visual image cues as he might in flying over featureless approach areas or in restricted visual conditions, then the above image would be encountered at three miles from the threshold and he would be high on the glide path. Conversely if he normally operated from a 300 foot wide runway and was now approaching a 150 foot wide runway then his visual approach would be low on the glide path.

The runways which slope up or down from the threshold compound the problem even further. As this also alters the expected image from a given point in space from the threshold, and could result in the pilot raising or lowering his aircraft altitude until the visual runway image was more in line with what his memory said it should be. This could result in an undershoot or overshoot.

Terrain sloping up to the runway or down to the runway, as can be encountered in mountainous areas, present visual cues from the ground below the approach area which may force the pilot to set up a dangerously low approach in the one case or dangerously high in the other.

The best method to eliminate accidents from these types of illusionary cues, is, of course, a thorough pre-flight planning prior to the flight, and if possible the crew should simulate the landing before actually landing. Some of the factors important in your pre-flight planning to an unfamiliar base, or in consideration of your possible alternate

(a) Runway – width and length
(b) Runway slope
(c) Slope of terrain leading to runway
(d) Topography on the approach
(e) Runway lighting system
(f) Does airfield have VASIS?
(g) I.L.S. and VASIS, G.C.A. intercept point
(h) Time of day or night of approach

Visual cues are reduced at night and most pilots accept that approaches made at night will be more hazardous than day approaches. Such obvious factors as restricted visibility, loss in depth perception and visual interpretation of relative distance have been discussed frequently in scientific articles. Other considerations of the daytime work/night-time sleep cycle, and that night approaches occur usually after a day's activity, with resultant fatigue, heighten the feeling that night approaches are much more likely to result in an accident than day approaches.

However, this has not been borne out in one study of USAF accidents which showed that there was little difference in the accident rate between day and night, in fact the transport squadrons were significantly safer at night than during the day. This would seem to indicate that pilots aware of a hazard, tend to fly in an aware and safer manner. Perhaps the same caution in daytime in restricted visual conditions or on approaching strange or new runways would reduce the daytime approach accident rate.

The American study did show, apart from the comparison of day/night accident rates, that the bulk of night accidents were landing accidents where darkness was at least an aggravating factor in 48% of the accidents. In fact, one type of approach accident at night is so common nowadays that it has been the subject of considerable study. This approach accident type occurs on clear nights over dark terrain, when the runway can be seen at great distances. A series of near misses on the approach to Adak Airport in Alaska when the air controller saw the aircraft radar contact disappear behind the Great Sitkin Volcano on the visual approach, were puzzling to the controllers, and exciting for the aircrew, but the tragic fatal crash of an airliner into this volcano prompted further study into the reasons behind these low approaches. The researchers used a simulator and a scaled city airport model to investigate the factors that could be significant in night-time visual approach accidents. The result of their studies showed that the lack of visual feedback from topography under these conditions led the pilots to fly towards the airport by maintaining a visual null, on maintaining a constant visual angle of the city perimeter lights. This approach path follows the arc of a circle centered above the pattern of runway lights with its circumference contacting the terrain at some point. The diameter is usually large enough to give the subjective impression of a straight line approach; dangerously low altitudes can result by depending on this type of visual cue.

Apart from the Adak disaster, there have been other accidents which involved approaches over dark or featureless terrain or water at night and which resulted in accidents. A major airline recently landed an aircraft in a shallow bay short of the runway under dark approach conditions, fortunately without serious loss of life. The recent Electra crash over an ice surface towards a remote arctic runway may have involved the same phenomena. In Canada's remote military airfields with approaches over dark bushland such as Greenwood, North Bay, Bagotville and Chatham, or approaches over dark water areas which might be encountered at Summerside, Shearwater and Comox, it is advisable to be particularly careful on making a visual approach at night.

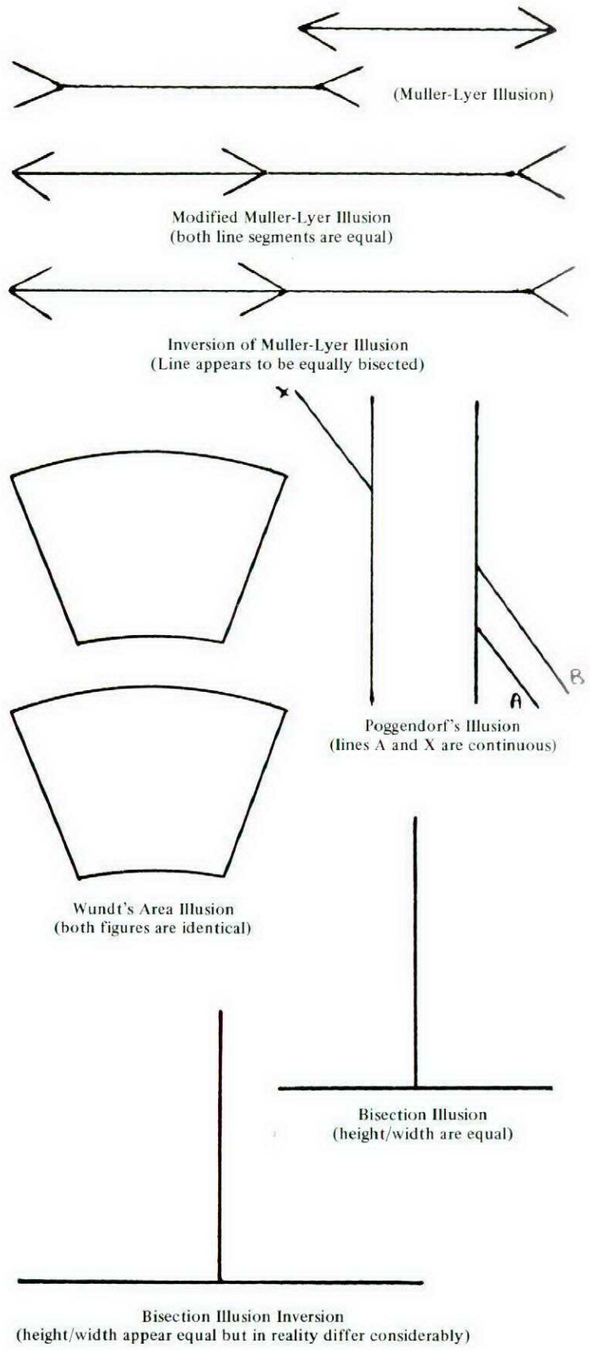
Vision can play tricks in your interpretation of what you see, and create mental conflict. For example, the following picture is either an old lady or a young girl depending on which way you look at it. This shows that the same visual stimulus can be interpreted in different ways.

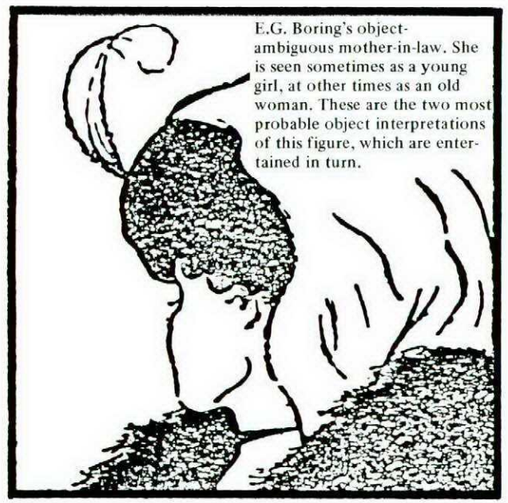
Interpretation of the visual images on the approach is a continuous comparison of the visual image with remembrance of past visual images. It is easy to see how in featureless approaches in poor weather and over unfamiliar terrain that you may firstly not receive enough visual cues to interpret correctly, or be unfamiliar with the approach topography, the result being a dangerous approach.

Weather also, such as rain and fog, can affect your interpretation of what you see. Rain can change the optical characteristics of the windshield. It can reduce vision and render invisible many of the objects which you should be concerned about on the approach, such as trees, powerlines, telephone poles and other aircraft. The ripples and blurs caused by the rainswept windshield act as a prism and could deceive you into thinking that the plane is higher than it actually is.

Fog can also cause misjudgements in distance. A common example is the misjudgement of mountains on a clear day versus a hazy day. On clear days, mountains seem smaller and nearer; on hazy days they seem less distinct, but larger and further away. The error in distance judgement is apparently directly related to the density of the fog. Therefore, a pilot landing in fog will judge himself to be higher than he actually is and may fly a lower glide path than normal. Modern landing aids serve to reduce the hazard, but on final approaches in fog conditions the runway-lights themselves create an illusion. The washed out and indistinct appearance of the lights as it progresses from a vague glow to a recognized light, occurs over a period of time so that the pilot is not aware exactly when he saw the light. In shallow fog the pilot tends to look at the wrong place as the glow first appears on the fog top directly above the lights and the colour of the red barettes and more frequently the green threshold lights were consciously not observed at all in thick daytime fog.

In conclusion the interpretation of visual cues on landing is a very complex process, which can be upset by changes in base, visibility, light intensity and weather. The USAF Air Transport comparatively low night accident rate shows that a wisespread acknowledgement of the existance of a hazard can result in a reduction in the accident rate. Your awareness and acknowledgement of the visual problems discussed in this article will KEEP YOU SAFER.




E.G. Boring's object-ambiguous mother-in-law. She is seen sometimes as a young girl, at other times as an old woman. These are the two most probable object interpretations of this figure, which are entertained in turn.

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Aircrew Life Preserver Flammability

by Maj J.J. Kramer, DAES 4

The flame protection provided by aircrew flight suits has been the topic of many controversial discussions and studies. However, no attention has been devoted to the flammability of the life preserver which is worn on the outside of flight suits, and the flammability requirements for aircrew life preservers have not been stated in procurement specifications in the past.

In September 1976, CFB Comox conducted a local test of the flammability of a Maritime aircrew life preserver. In the test, the life preserver was ignited within 4 seconds by a match held at a seam. During the burning, portions of the fabric dropped away and continued to burn. Fumes given off were repugnant. The entire life preserver was consumed by the flames in approximately 10 minutes. The results of the Comox test were reported to NDHQ by UCR and a project was initiated by the Directorate of Aeronautical Engineering and Simulators (DAES) to investigate the life preserver flammability problem and to recommend a policy for future procurement specifications.

The results of the NDHQ/DAES project will be briefly summarized in this article. For the purposes of this article, the following definitions shall apply:

a. Flammable fabric – one which continues to burn after it has been ignited.
b. Flame-resistant fabric – one which when ignited resists the travel of the flame over the fabric.
c. Flame-proof fabric – one which does not propogate flame when the igniting source is removed. (Self extinguishing).
d. Flame-retardent finish – one which renders a treated fabric flame-resistant.

The fabrics used in the manufacture of life preservers are constructed of a base fabric and a coating. This composition provides an impermeable material which can then be constructed into inflatable flotation chambers. Early life preservers used rubber coated cotton; however, these fabrics were subjected to rapid age deterioration. The next generation of life preservers were constructed of neoprene or polychloroprene coated nylon. These fabrics were more stable and most of the CF life preservers in service today use this fabric. In 1975 urethane coated nylon fabrics were introduced into service in the Maritime aircrew life preserver and the Transport passenger life preserver. The advantages of this material being:

a. stronger seams due to a heat sealing process vice use of adhesive;
b. no age deterioration of seams;
c. approximately 25% reduction in overall life preserver weight; and
d. lower life preserver procurement cost.

To determine the flammability characteristics of the two types of coated fabric currently used in CF aircrew life preservers, the Quality Engineering Test Establishment (QETE) was tasked in December 1976 to carry out flammability tests of both fabrics. It was found that the neoprene coated nylon burned regularly with no melting or dripping and that the urethane coated nylon burned intermittently but strongly with severe melting and dripping. It can be readily concluded from these results that neither of the fabrics currently used exhibit any degree of flame resistance. The only difference between the two is the actual burning process.

Specifications (Military & Civilian) for inflatables were then reviewed to determine what requirements for flammability are in common usage. The US military does not specify any flammability requirements in its specifications for coated fabric; however, most aircrew life preservers in service in both the USAF and the USN are designed so that the inflation chambers are enclosed in a protective pouch or stole. This pouch is normally made of inherently flameproof fabric such as "Nomex". Civilian company specifications for liferaft and escape slide neoprene and urethane coated fabrics state flame resistance requirements of a 6 inch burn length and afterflame of 15 seconds following a 12 second flame application. The Federal Aviation Administration (FAA) Standard for individual flotation devices specify flame resistance requirements for fabrics in that the burn rate must not exceed 4 inches per minute.

CF aircrew life preservers should assist in providing the wearer with flame protection rather than adding to the flammability hazard to which he may be subjected during an aircraft emergency. The ideal solution would be an inherently flame proof fabric; however, this is not readily available in the-state-of-the-art today. The recent advances of coated Kevlar fabric have indicated some promise in this area and DAES is actively pursuing some developments along this line. The next alternative would be to follow the American concept of protecting the life preserver fabric with an inherently flame proof material. In this regard a requirement has been established for other reasons by the Directorate of Air Requirements (DAR) to develop a new CF life preserver concept incorporating a protective stole. A development contract should be awarded in 1978.

The above two solutions are both obviously long term and do nothing for the immediate problem other than dispel some anxiety in that the future will be better. As an interim solution, treated fabrics which render a material flame resistant by means of a flame retardent finish should be a CF requirement. The specifications mentioned above indicate that this is entirely possible.

From the NDHQ/DAES project, the following conclusions were made:

a. The coated fabrics currently used in aircrew life preservers are flammable and offer no fire protection to the wearer.
b. The current state-of-the-art offers treated fabrics which provide some measure of aircrew fire protection. New developments such as inherently flame proof fabrics and other life preserver designs offer promise for the future.

The following project recommendations are being implemented:

a. Future procurements of current life preserver designs will specify flammability requirements such that the fabric must not be susceptible to combustion to the point of propogating a flame beyond safe limits after the ignition source is removed.
b. NDHQ/DAES will monitor advances in the state-of-the-art of inherently flame proof fabrics and pursue the new life preserver design to satisfy future needs.

MY VIEW

by Capt P.A. Growen, BFSO
CFB North Bay

It is probably correct to say that most of our Flight Safety emphasis in these last few years has been on improving supervision of flight. The words "personnel-supervision" seem to be cropping up more and more often. In accident/incident investigations, the supervisor has taken the place of the "butler" as the most likely culprit. Squadron COS, Base Maintenance Officers and all section heads are wondering how much more they can monitor individuals and be responsible for their actions. I for one find it very difficult to figure out what my wife is going to do next, never mind what a whole Squadron or Servicing Crew may do! I don't envy them.

Important though supervision is in influencing human behavior, there is more to flight safety than supervision alone. If we concentrate all our efforts on this one thing alone, flight safety is bound to suffer, for the basic concept of flight safety is to prevent accidents and this covers everything from aircraft design to amending publications and anything else you can think of. I believe that by putting too much emphasis on supervision, we are ignoring the man in the cockpit. We are taking away his decision making ability, and consequently are degrading his performance. As his authority to make decisions is removed and his responsibility for his actions increase, it is no wonder that his motivation decreases. As his motivation decreases, so does his discipline. Remember, motivation and discipline are the keys to safe and successful air operations. Without them, he is betting his life and the lives of others, each and every time he flies.

Flight Safety must be positive. If after each accident, we apply wider safety margins, we will continue to erode aircrew ability. They will become unable to cope when an occurrence pushes them beyond the limits of their experience/training. I am positive that we are at the stage where wider margins will degrade our operational effectiveness. Operational flying and operational training are high risk operations, and some aircraft losses are inevitable. Obviously, we must seek to conserve our limited aircraft resources, but we are deluding ourselves, if, by restricting training to conserve aircraft, we limit our aircrew to a competence level that is ineffective. Crew capability must be recognized as the highest priority. We have found ourselves very well trained for peace and not for war.

What can flight safety do? Flight Safety today is being used as the panacea to all our ills. Under its umbrella, almost all flying decisions are made. When things come unglued, use flight safety to dream up another rule. When things are going smoothly – ignore flight safety. Remember, all that flight safety people can do is advise. If their advice is ignored or acted upon, so be it; however, they do not make the rules, and they do not enforce them. So what now?

Today the emphasis is on closer supervision. I believe that over-supervision is certain to be counter-productive. Emphasis should be shifted back to the individual in the cockpit. Group Captain D.T. Bryant RAF wrote in a recent Air Clues Magazine that, "Flight Safety was a non-subject".

He stated that there are only four things that really matter in fighting from an airborne weapons platform:

1. Operational ability – if you can't do your job, there is no point in getting airborne.
2. Professional pride – if you don't have it, you won't be able to do your job properly.
3. Self control – if you don't have it, you cannot develop genuine professional pride.
4. Self criticism – if you don't have it, you won't know in which areas to exercise self control.

In this four point concept, the onus is firmly on the individual, and in my experience, the sort of individual that we wind up with in our cockpits responds well to responsibility. Two way trust is required. Then let's have it from the highest level to the lowest, not just between aircrew and ground crew. Safe flying will then drop out like the proverbial ripe plum, and executives in flying appointments can revert to being what they should be, airborne fighting leaders with additional management responsibilities on the ground.

So long as we insist on restricting the one person who should have freedom of decision, then so long will we be totally "flight safety" oriented and not job oriented. There appears to be a unilateral crusade afoot – one based on hindsight, theory and absolute control over all thinking and actions. Let's give back some of the decision making to the man who is on the pointed end of the stick, and let's give him the support he is so badly in need of.

As a last thought I believe we need a goal or mission for the Armed Forces and I don't believe that the goal in itself should be "flight safety". Flight Safety must be a most definite personal goal, however, our sole reason for existence is to fly and fight, and we must learn to weld these together and not champion only one.

PIPELINER

by LCol F.R. Sutherland, CD

As I returned to Europe in the 707, I had an opportunity to ruminate about the conference which had just taken place in Winnipeg. The conference, for COs of CF Flying Squadrons, had been organized by Air Command and had proven to be a most beneficial and edifying experience. In addition to briefings presented by senior Aircom personnel on the organization, responsibilities, and operation of that Headquarters, we were given an opportunity for a face to face session with the Commander. During this session he expounded candidly on his views on a number of items of interest to each of us including LRPA, NFA, other capital and personnel programs, chain of command and flight safety. Additionally we were able to air (no pun intended) issues of concern to us as COs and to solicit support at the highest levels.

A special session was also devoted to Flight Safety, including a review of accidents, trend analysis, and considerable discussion on all aspects of this most important area. One of the constant threads throughout the discussion was the subject of supervision and the supervisory roles of the Squadron COs. From this discussion, and from the revelation during the conference that we could expect to see an increasing proportion of pipeliners to experienced personnel in operational squadrons, this article found its genesis.

This article could thus have been written as a treatise on the care and handling of pipeliners; however, I decided to use a discussion of pipeliners as a vehicle for addressing the more pervasive subject of supervision.

Before proceeding I should, as is customary when discussing a subject of this nature, provide a definition. What is this magical creature called "pipeliner"? My forays into the lexicographer's world proved fruitless, for I deal not with the rugged men who work on oil and gas pipelines. Rather, within the context of this paper, a pipeliner is ". . . a person (young or old, but mostly young!) who is newly graduated from the Canadian Forces Flying Training System"."

To go back to the Conference for a moment; the first indication of an influx of more and more pipeliners into operational squadrons was greeted with a very audible and collective sigh as some COs saw their heretofore unblemished flight safety record cast into the gravest jeopardy. Their trepidation was a not unexpected manifestation of human nature; indeed every CO would like to have the maximum amount of experience in his squadron. Such experience is not one of the characteristics of the pipeliner; thus the COs' dilemma. Just what is the pipeliner's experience level?

For those who are not au fait with the new CF Pilot Training System, the pipeliner graduates with some 200 hrs (25 hours on the Musketeer and 180 hours on the Tutor) with his pilot's wings and a white ticket. He then proceeds to one of several OTUs for conversion to assigned aircraft type and for more advanced training. Depending on the training stream he has followed, he arrives on squadron with anywhere from 300 to 400 hours.

How is he perceived? Probably he is viewed as a cherubic faced youth with a large question mark over his head and, as was mentioned earlier, a potential threat to the unit's enviable flight safety record. He is also viewed in some eyes as one who appears to be pre-occupied with retirement plans and investment portfolios, rather than those things which ought to occupy a pilot's non-flying thoughts! On the other end of the spectrum is his perception of himself, probably as a young tiger who will show everyone that his selection to an operational tour was the soundest of decisions by PCO pilots.

What he normally turns out to be, as those of you who have worked with pipeliners will know, is somewhere between these two roles, and amazingly consistent with what you would expect a person of his situation and experience to be. He is first of all, of course, apprehensive and perhaps a bit overwhelmed at the magnitude of the challenge facing him. He also probably displays one, some, or all of the following characteristics:

- a high degree of motivation,
- tremendous enthusiasm, manifesting itself in an eagerness to listen and to learn,
- a healthy inquisitiveness (some have even had the temerity to ask the whys and wherefores of long established, and heretofore sacrosanct, policies and procedures),
- high expectations, and
- timorousness (this is often camouflaged behind a veneer of bravado by playing a role consistent with his image of what he should be, and is a particular occupational hazard of a fighter pilot)!

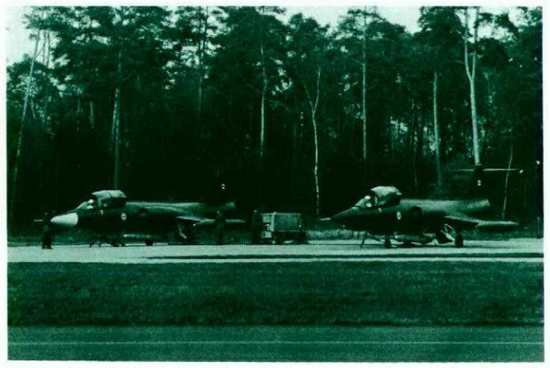
There are, of course, a myriad of other characteristics; however, those cited above represent a reasonable cross-section.

Well, now that we have the pipeliner on board and we have some insight into his experience and characteristics, what then do we do with him? With the indulgence of the reader, I will delineate the program utilized in 1 CAG, the program with which I am most familiar. I would be remiss, however, if I did not, as a precursor to that description, allude to the programs required by other formations to bring pipeliners "up to speed" in their respective operations. There are tremendous differences in the training program required for pipeliners in a single seat fighter squadron from that required for his colleague posted to Transport, Maritime, SAR, or other type flying. Items such as crew cooperation, PMAs and responsibility for large numbers of people (passengers and/or crew) are not part of our requirements. Thus I readily acknowledge that there is no simplistic approach to "indoctrination training". Yet establishment of such training, consistent with user requirements and cognizant of pipeliner experience (or better, perhaps, lack of experience), is of cardinal importance.

Let us look then at the 1 CAG program. First of all, formal requirements are laid down in the Attack Training Directives, a document which covers each of the three facets of training: orientation, indoctrination and continuation. After arriving in Europe, the first task facing the new pilot is to complete orientation training, consisting of a T33 checkout in European instrument procedures and local area familiarization. The five T33 aircraft allocated to the Group Transient and Training Flight (GTTF) provide 1 CAG pilots with a cost-effective means of maintaining instrument flying proficiency. After two weeks flying with GTTF he begins formal CF104 indoctrination training, flying under the supervision of a highly experienced squadron monitor pilot. He requires approximately 2-3 months to become familiar with low level navigation in Europe and to complete a checkout on the three primary weapon ranges on which he will operate while in Europe. Once the upgrading program is completed the pilot is tested by Group Tactical Evaluation Personnel. Successful completion of written exams and a special mission results in the pilot being awarded combat ready status.

Being combat ready qualifies the pilot to fly as number two or number four in a CF104 attack formation. After approximately 8 to 12 months as a wingman the pilot goes through another upgrading process to qualify him to become lead of a two plane formation or to act as number three of a four plane formation. The final step in the upgrading process is to qualify to lead the basic four plane formation.

Throughout the upgrading process the ground school training program is designed to add to and improve the pilot's knowledge of the enemy's defences and his equipment capabilities, the best utilization of the weapons available to the CF104, and the more sophisticated offensive and defensive tactics employed in 1 CAG.



However completion of the formal training requirements is not an end in itself – the so-called putting the "X on the board". Adherance to the program does not necessarily constitute effective discharge of the supervisor's responsibility. Let us look at our newly arrived pipeliner again. For reasons delineated earlier, pipeliners come in all shapes and sizes and, more importantly, they come with different personalities and abilities (which makes them remarkably like all other pilots!!) The following quote describes the situation fairly succinctly:

> "A particularly vulnerable phase in a pilot's career comes in the early stages of his first squadron tour when he is being trained to become a productive operational pilot. Individuals, even of apparent equal ability, progress at different rates; inexperienced pilots generally do not admit to their limitations, even if they know them, and some will have had difficulty making the grade or will have exhibited potentially dangerous traits in their first months in the squadron. Crews need very close supervision if their self-confidence and skills are to be developed without, at the same time, overtaxing their ability and confirming bad habits. It is tragic that this care and protection all too frequently are found missing."

"Control and Supervision of Flying", *Aerospace Safety* Aug 1976 p. 19-21.

Thus, the formal training requirements must be adapted to the varying abilities and capabilities of the new pilot, and it becomes the supervisor's twofold responsibility to:

- be aware of his fledgling pilot's personality, ability, problems, etc.; and
- make sure that the new arrival's training is consistent with these factors.

Some might say that such a program is tantamount to nursemaiding and that we can't afford to carry people. Of course we can't; we all know the tragic consequences which almost inevitably obtain from carrying people who "can't hack the program". We must, however, expect our pipeliner to make mistakes which, once again, makes him remarkably like the rest of us! He must learn from these mistakes and continue to progress; if he does, he is well on his way to becoming an operational pilot, ready to assume increasing responsibilities. The supervisor's role in this area of early training is perhaps best summed up in the findings of an accident board convened a few years ago in the UK:

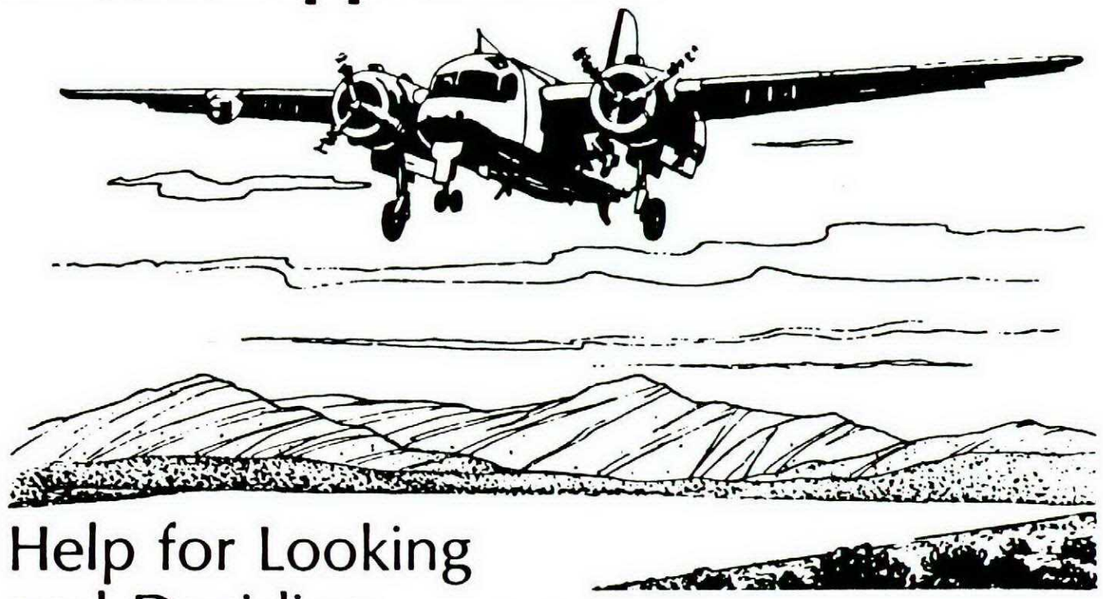
> "The creation within a squadron of an atmosphere in which pride does not prevent open and frank discussion and, in which, different abilities can be recognized without fear of diminishing confidence, will help increase operational effectiveness as well as promote safety".

In summary, the pipeliner possesses many of the same characteristics of his older and more experienced colleagues. He does, of course, lack experience. It is the supervisor's responsibility to know him, to have a training program for him, and to ensure that, within reason, the training program is flexible enough to adjust for differing personalities, strengths and weaknesses.

To look at it another way, that fledgling aviator standing in front of you might well have the potential to be one of our senior airmen in 20 or 30 years. We owe it to him and to the brotherhood of Airmen to challenge him, to stimulate him, and to help him develop professionally – in other words, to get him off to a good start both as an officer and as a pilot.

P.S. The program described above is discussed within the context of training the pipeliner. The principles apply equally to training *every new* member of the squadron.

Missed Approaches:



Help for Looking and Deciding

by Robert N. Buck

Now and then, on an instrument approach, minimums are reached and the ground isn't there. A missed approach should then be executed but pilots do not like to make them. Why?

There are a lot of pressures to land. First is the idea of not getting in; second is the uncertainty of the sort of treatment which will be received from the ATC system; third, fuel may be tight and the idea of going to an alternate isn't appealing; lastly, it gets to be a matter of pride, coming from the mistaken idea that missing an instrument approach is a reflection on one's ability.

Approaches are missed for two basic reasons: (1) the weather is below minimums and (2) the approach was fouled up. As the famous writer, Will James, said, "There ain't a horse that can't be rode, and there ain't a man that can't be throwed."

The same goes for a bad appraoch – all pilots can make and have made 'em. It happens, for one reason or another, when the ground shows up and the aircraft is cattywampus to the runway. At low altitude, getting lined up from offcenter is difficult and dangerous – the faster the landing speed the more difficult. If the needles are much outside the dot at minimums, the geometry and physical laws make getting on the runway close to impossible. The wise pilot, perhaps with a disgusted sigh, pours on the coal and gets out of there to try again.

Why a good approach wasn't made isn't important at the time. It may have been that the pilot wasn't up to par that day, or ATC vectored him in too close, at too big an angle and too fast. There are all kinds of reasons, but the pilot who is clever doesn't much worry about the reasons at minimums – he just knows the approach was bad and he'd better get out. The reasons can be sorted out later over a cup of coffee.

Approaches are missed because the weather is below minimums and the pilot doesn't see the runway or airport adequately. This is the danger area: it's tempting to let down a little more when the ground is visible in little chunks, but famous last words run something like, "Shove her down a little, I think I've got the runway!"

The asininity of sneaking below minimums, when the ground cannot be seen properly, isn't worth talking about – it's stupid! But how the pilot reacts at minimums, decides if he has them, and then lands or leaves, is another matter and not always easy.

A copilot helps – lots! One flies the airplane and the other looks. The one looking out tells what he sees. This is a procedural matter and is worked out to a fine degree by many airlines (*and it can be by military crews – Ed.*) But however it's done, a couple of points need stressing: one is that the caller-out, the pilot looking out the window, should state clearly what he sees so the pilot flying will look up only when he knows he'll see enough to land.

The looker-out saying, "I've got it!" isn't enough. He may say "I've got it!" when all he has is a straight-down ground contact through some holes. If the pilot looks up then, expecting to see the runway, he'll get an awful shock to see that he's still on instruments. He may relax his concentration on instrument flying, then looking back to get on instruments again, he may find he's slipped in altitude, is off the localizer, and has a wing down. He has to get everything reorganized quickly, and at a critically low altitude.

What the looker-out should say is something like, "Ground contact . . . I've got the lights . . , runway in sight." That gives the guy flying a progressive picture of the ground visible straight down, then the approach lights beginning to show, and finally when the copilot says, "Runway in sight," he knows he has enough to land by. Now, not before, he looks up and takes over visually. But if the copilot never sees enough, he says, "Minimums, no runway!" Then the pilot doesn't have to look out – he stays on the gages, opens throttles, and climbs out of there.

Flying alone is another ball game. There isn't time to look out visually for more than a quick glance. So the best that can be done is to go to minimums, take a quick look, and if it isn't good enough to land from that glance, get out. If the visibility is fuzzy and visual orientation is difficult, the pilot simply cannot afford to look out for more than an instant because it's too easy to slip in alittude and attitude and go off to dangerous places. What happens is that the pilot has to make an appraisal and judgment all in one quick glance. That is not easy. Occasionally a missed approach is made when the pilot might have gotten in, but that's the price one pays for not having a copilot – for being safe.

The pressures for trying too hard to get in are often the ones that trap a pilot. First, if there is plenty of fuel there is less pressure. Then there is no worry about going to an alternate if that becomes necessary, and the pilot isn't worried that ATC will send him back to the end of the line with a long delay if he wants to make another try. Generally, ATC will try to fit the aircraft back in for another try if the pilot wishes, but ATC cannot perform miracles. If there is a bunch of airplanes, they have to keep 'em apart – they can't make 'em dissolve. So one can get a 30- or 40-minute delay before the next try at a busy place and busy time.

It is also easy, perhaps due to a long hold or headwinds, to use part of the alternate fuel. This is pretty silly, but people occasionally get in the position of not having enough, or barely enough, fuel to make an alternate. And that puts on real pressure to get in on the first try – a very un-pro operation

There's also psychological reticence to make a missed approach becuase the missed approach procedures are complicated. FAA is being pressured to obtain relief, but for the moment a lot of missed approach procedures are unreasonable. Unfortunately we have to live with them and so the key to doing so is to be prepared in advance. Thinking through the missed approach procedure before starting an approach is necessary. The wrong place to wonder about procedures is when the throttles start up on the missed approach.

There is pressure, too, of the brass wanting to get in for the meeting. Well, the brass ought to know that it's better to delay a meeting than never make it at all, or maybe any meeting, ever.

Missed appraoches are part of the flying business; if we're seriously in the business, we'll make 'em.

Courtesy Flight Operations Magazine

GOOD SHOW

CDT J.A.L. VAN DE WATERING

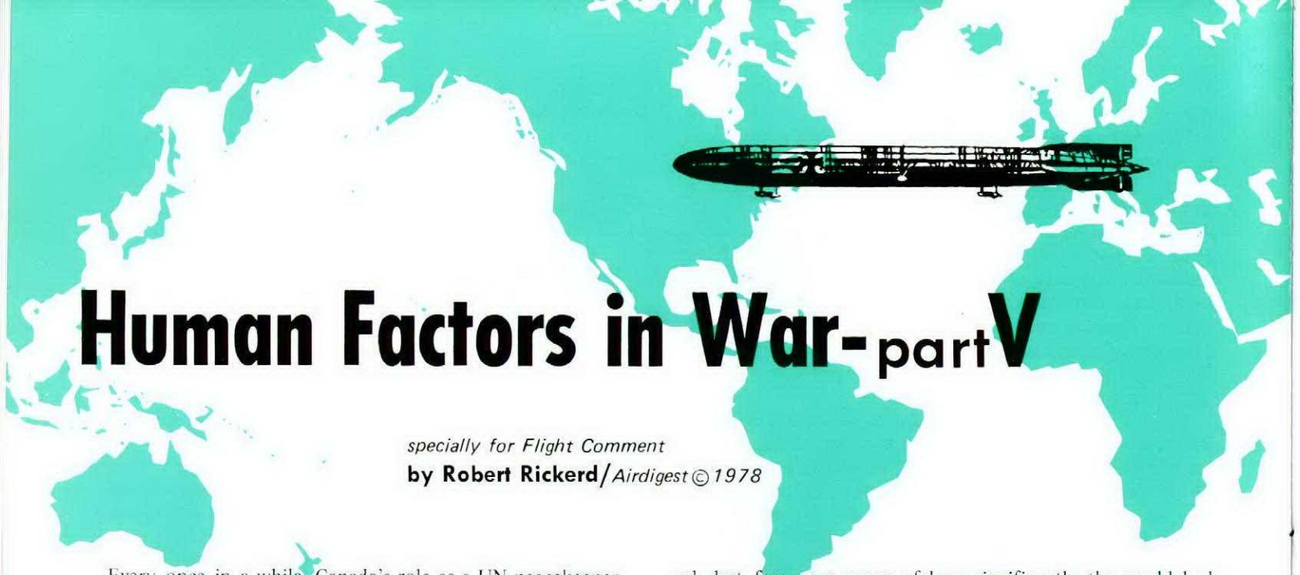
On 28 March 1978 Cadet Van de Watering, a Royal Netherlands Airforce student on his fourth Tutor solo trip, experienced multiple birdstrikes ingesting one of the birds into the engine. This ingestion resulted in a compressor stall accompanied by high exhaust gas temperatures, in the neighbourhood of 800 degrees celsius and a partial relight with a maximum of 78 percent RPM obtainable. Given this situation, downwind in the traffic pattern, Cadet Van de Watering not only correctly handled this emergency but managed to bring his aircraft, Tutor 144101, back to the airfield for a successful and safe landing.

The previous instructional trip, his second since soloing, had been clear hood 15 during which he was introduced to practice forced landings. Cadet Van de Watering, under close supervision, performed one practice forced landings from the Moose Jaw area at altitude: this was the total sum of his forced landing procedure experience. Practice forced landings from the traffic pattern were to be introduced during his next instructional mission, clear hood 16. In fact at this stage of training, it is strongly recommended that solo students with a problem of this nature eject rather than attempt a forced landing.

A post-flight inspection of CT 114101 showed that the aircraft had sustained four birdstrikes; two grazing the right wing, one glancing off the right side of the right hand windshield and the right side of the canopy; while the fourth entered the right hand

engine intake ducting before being ingested by the engine. With the engine removed, but not opened up, extensive damage was found to all visible front end stages of the compressor and bird remains over the engine nose cone and inlet guide vanes.

Cadet Van de Watering's reaction to the bird strikes and ingestion was that of an experienced pilot. He simultaneously zoomed, initiated a relight procedure, turned toward the airfield – abeam the button – and even managed to declare an emergency. The gear was lowered approaching final key, followed by flaps culminating in a safe landing. Given the initial emergency situation with the resultant engine damage and problems, and the very low level of experience of this student, Cadet Van de Watering is to be commended for retaining his alertness in appraising the situation, properly responding with complete emergency procedures and successfully bringing his crippled aircraft in for a safe landing. His prompt, professional handling of this emergency definitely prevented the loss of a valuable aircraft.



Human Factors in War-partV

specially for Flight Comment

by Robert Rickerd/*Airdigest © 1978*

Every once in a while, Canada's role as a UN peacekeeper arouses criticism when some unfortunate Canadian Forces member, perhaps inevitably, becomes a casualty in the name of peace. But Canada's policy makers realize that efforts at peacekeeping are a necessary follow-on to her great sacrifices in World Wars I and II and as an insurance against what may be the third and final holocaust.

In two world wars, Canada has remained territorially unscathed, largely because of her timely and courageous decisions to face trouble while it was still far from home.

In the first world war, technological limitations preserved North America from any serious threat of enemy attack. During the second world war, however, the technology for a major attack on North America did exist. Were it not for the efforts of Canadian and other Allied servicemen serving hundreds of miles from home, who kept the Axis powers occupied over seas and brought the war to an end when they received first-hand knowledge of how Londoners felt during the Blitz.

To be sure, there was also a threat by sea, however limited. A German U Boat sank a transport in the St. Lawrence River as early as May 1942 — and agents were landed on North American shores by the same means. But due to the distances involved, the weather conditions, and more important, the courageous defence of the sea lanes by Allied ships, an enemy invasion was never a real possibility.

However, air attacks on North America had been an ambition of the Germans as early as 1915. The weapon then was to be the Zeppelin. In October 1917 a 4,200 mile round trip flight was achieved between Germany and her East African colony. It was hoped rather naively, that this remarkable long distance effort might influence the United States against entering the War.

On 29 July 1918, the L-71, which had been specifically designed to bomb American cities, made its first flight. This 700 foot long monster cruised at 100 miles per hour and had an incredible 12,000 mile range. Fortunately, the Armistice ended plans for the assault on the U.S.A. although Zeppelins did inflict considerable casualties and damage on London and other English cities.

Britain was the first to achieve a round trip Atlantic crossing with the airship R-34 in July of the following year. In the previous month, Alcock and Brown had been the first to achieve a non-stop one-way crossing with an airplane. The natural barrier offered by the Atlantic Ocean had been hurdled, but few were aware of how significantly the world had shrunk.

Even Charles Lindbergh's own solo crossing of the Atlantic in 1927 and his visit with Goering, Milch, Udet, Heinkel and Messeschmitt in Germany nine years later did not seem to influence his isolationist posture. He visited the Junkers, Focke-Wulf, Henschel and Daimler Benz factories, inspected the Junkers 87 and 88 and Dornier 17 bombers, and flew the Messerschmitt 109 but did not seriously ask himself what Hitler intended to do with all this weaponry. And when he flew the Junkers G38 airliner (larger than the WWII B-29 and later converted to a bomber by the Japanese) he did not realize that this aircraft or others like it might cross the Atlantic and threaten the U.S. one day.

By the time Lindbergh had accepted the Cross of the German Eagle in October 1938 as a reward for his friendly and pacifistic influences in keeping the U.S.A. neutral, a German commercial airliner had already flown the 3,959 miles from Berlin to New York non stop. Fortunately, Hitler's ambitions were becoming apparent to other Americans but it is interesting to note that Winston Churchill had warned Britain of the German air menace in 1934.

In 1933 a requirement for a long-range bomber capable of attacking any point in Britain or Russia was issued to aircraft manufacturers in Germany. The leading entry in this "Ural Bomber" competition, not surprisingly, was also a Junkers Company product. This Company had pioneered the all-metal airplane in World War I and made an enviable reputation for itself between the wars. Germany's bomber development progressed through the "Bomber A" program to the "Amerika Bomber" of 1940, the production of which received increased attention after the United States entered the war on December 11, 1941. Once again the Junkers Company was in the forefront of the competition.

In the spring of 1942, a stretched six engine version of the Junkers "Ural Bomber" design was submitted as a solution to the "Amerika Bomber" requirement together with designs from other manufacturers.

In August and October 1943, the first models of the Junkers design were flown. Capable of 32 hours of non-stop flight, the second example was delivered to a German squadron based south of Bordeaux, France, in January 1944.

It was from this point a short time later that North America came within a few minutes of experiencing its first aid raid alert when this aircraft completed a practise flight which took it to within twelve miles of the U.S. coast north of New York before turning and returning successfully to its base!

Admittedly, the U.S. and Canada were the target of a futile air borne attack by Japanese bomb-carrying balloons in 1944-45 and a tiny submarine-based Japanese airplane dropped bombs harmlessly in the state of Oregon in September 1942, but this flight proved conclusively that North America could no longer isolate itself from the rest of the world.

Fortunately for us, by November 1943 the tides of war had already turned on the Axis powers. Italy had capitulated and had in turn declared war on Germany. Germany was retreating on all fronts and her oil refineries and munition factories were being pulverized by the Allied Air Forces. In the Pacific, the Japanese land and sea supremacy was in eclipse.

So at a time when Germany's technology was nearing its peak the pendulum of her war effort was beginning the swing to the defensive. The aircraft industry was thus forced to relegate bomber development to a low priority and concentrate on fighter aircraft production for home defence. With the exception of the aimless use of unmanned "V weapons" on Britain, sustained offensive action was no longer possible. It had been close and the price had been high.

Britain, which bore the brunt of Goering's bombers, lost 65,000 civilians in air raids and 6.5 million dwellings were destroyed. And that was only part of her loss.

Canadian civilians and their homes on the other hand emerged unscathed. That is why we should not only remember those who gave of themselves in our defence, but thank them that they had the courage to take up arms to fight "somebody else's war" and thus spare our country from attack. Over 110,000 Canadian servicemen never saw their loved ones again and 94,000 of these are buried in 70 countries around the world.

Think about it.

NEAR MISS

Recently a CF Tracker aircraft proceeding on patrol from CFB Shearwater was unknowingly involved in a near miss with a large scheduled air carrier at Halifax International Airport. The Tracker had requested and was cleared by Halifax Tower to pass overhead, turn right and depart the control zone remaining VFR. At the same time the commercial flight was following radar vectors for an ILS approach. As the Tracker passed over the airport and altered course to the right, the pilot chose to descend from 2000 to 1500 feet to remain well clear of an isolated snow shower. It was at this time that the commercial flight penetrated the scattered to broken cloud during his descent and passed within 200 feet of the Tracker's 6 o'clock position. Travelling at approximately 200 knots and descending at approximately 500 feet per minute the commercial aircraft was unable to take evasive action to provide further clearance.

The tower and terminal controllers informed their supervisors of the hazardous situation and an ATS team from Ottawa was dispatched to investigate the occurrence. Although the findings of the board are not known at this time it is unlikely that any violation or infraction was committed by any party. Notwithstanding the incident does exemplify the ATS problem of ensuring separation between controlled IFR traffic and VFR traffic in a control zone. The system is fallible and thus every precaution must be taken to preclude a recurrence.

From the military point of view and in accordance with CFP 100, pilots are encouraged to file IFR whenever practical. If VFR flight is being conducted then the principle of see and *be seen* is on the onus of the pilot. Pilots are reminded that VFR weather criteria are minima and that whenever possible, a greater margin for safety should be allowed, particularly in terminal area. In addition, it is considered prudent to advise the controlling agency whenever heading or altitude changes are taken in efforts to remain VFR within a terminal area.

Maj M.L. Myrhaugen, SOFS MAG HQ

pin it down - write it up

Sgt Rita Patry
— *a guardian angel*

by Capt J.D. Williams

If I ever have to leap out of an airplane, I'll have just two wishes while dropping through the sky waiting for parachute opening. The first one will be "I sure hope this chute was packed by Sergeant Patry", and the second will be "I sure hope she is keeping up her normal standard". And if history repeats itself as they say it does, then my continued longevity will be assured.

To the best of our knowledge no one has ever packed more parachutes used in more successful unplanned ejections. Sure there are skydivers who have "packed their own" for thousands of jumps, and sure there are packers with the Airborne Regiment whose chutes have been successful probably hundreds of times – but we're talking here about emergency bailouts – and that my friends is a whole different ball game.

Sergeant Rita Patry, currently stationed at CFB North Bay joined the RCAF in Vancouver in February 1952. She took her Manning Depot training in St. Jean, P.Q. and then was transferred to RCAF Station Aylmer for the basic safety systems training which was eventually to save the lives of 11 Canadian aircrew. Subsequent postings followed to Claresholm, Portage, Bagotville, Gimli and 3 and 4 Wings of the Air Division.

Sergeant Patry began her string of "saves" in 1953 when a Flight Cadet from Claresholm found it necessary to clamber over the side of a Harvard. Ten years later a Squadron Leader from Portage carried out a successful nylon letdown from a T33 and very shortly thereafter another student followed suit. Three more successes occurred in Training Command before Sergeant Patry entered the CF104 arena.

Serving in Baden in the years 1969 to 1971, Sergeant Patry was responsible for the packing of eight chutes which brought their owners safely to earth after two mid air collisions, one inflight fire and several other exciting events.

Working for years as a safety systems technician is not by any means a matter of constant excitement. For every chute used there are thousands of routine packings, hundreds of seat pack inspections, many helmet fittings, and innumerable workaday tasks to be carried out. The point is, that at any time – completely without warning, the work done may be put to the ultimate life or death test. Keeping up the standard is more than just a matter of duty, it is one of pride, one of professionalism of the highest standard.

Sergeant Rita Patry has earned the respect of those who work with her, and the undying gratitude of fourteen non-voluntary parachutists. Her attitude toward her work and the proven results of that attitude are truly representative of that which is best in this organization. Flight Comment takes this opportunity to salute Sergeant Rita Patry as a fitting example of the many unsung heroes who keep our aircraft flying and keep us alive to fly them. Without them we couldn't possibly turn a wheel.

Don't ever forget it.

On the Dials

In our travels we're often faced with "Hey you're an ICP, what about such-and-such?" "Usually, these questions cannot be answered out of hand; if it were that easy the question wouldn't have been asked in the first place. Questions, suggestions, or rebuttals will be happily entertained and if not answered in print we shall attempt to give a personal answer. Please direct any communication to: Base Commander CFB Winnipeg, Westwin, Man. Attn: ICPS.

This space has been unused for some time now, mainly because we were experimenting with the "ICP Newsletter". For readers that have never heard of the ICP Newsletter, check with your BICP or Squadron ICP. We intend to continue with the newsletter for the immediate future at least. However, to ensure wider dissemination of some of the information contained in the newsletter, we will use "On the Dials".

1978 Instrument Rating Exams

By the time you read this, the 1978 exams should be in the hot hands of your unit's ICP. The format is the same as last year; that is, a MET PIP and exam, and an Air Regulations and Procedures training package plus a closed book exam. The latter is based only on CFP 100 and GPH 204, and is designed to be written after completion of the training package.

Instrument Approach Procedure Identification

During a recent discussion it was discovered that an experienced pilot had flown an ILS/TACAN approach utilizing TACAN only. The person concerned mistook the ILS inbound for his course and the glide path INOP MINIMA for his MDA. This misconception is dangerous.

The navigation aids required to conduct an approach are given in the procedure identification. For example, what is the difference between the following:

(1) HI.TACAN/ILS RWY 30; and

(2) HI.TACAN.TACAN/ILS RWY 30?

Example number one requires the use of both nav aids. The clue to this fact is the oblique stroke connecting the two nav aids. Now consider example number two. A dash separates "TACAN" and "TACAN/ILS" indicating that a straight TACAN is authorized and limits for it will be published. Also, a TACAN orientation to an ILS final is authorized and limits for the full ILS will be published. Glide path INOP and circling limits may also be published, assuming descent gradient criteria are met. In other words, there are two distinctly separate procedures published on one page which may be recognized immediately by the dash separating the nav aids required for each approach.

In the USA, an approach procedure is identified only by the nav aid(s) required from the final approach fix to the runway. For example, if ILS provides the final approach course guidance, the approach will be identified as "ILS RWY 9", even if some other nav aid is required to fly the initial segment of the approach. See HI.ILS RWY 9 at Dannelly Field (Figure 1). It is necessary to have a TACAN as well as ILS when flying this approach but, since TACAN is not required on final, it is not included in the procedure identification.

Since 7 July 1976, USA approaches combined on one approach plate have the word "or" to indicate that either type of aid may be used to execute the final approach. See "HI.VOR/DME or TACAN or ILS/DME RWY 13C" at Columbus AFB, (Figure 2).

An oblique stroke (/) in US FLIPS indicates that more than one type of nav aid *must* be used to execute the final portion of the approach. In Figure 2, both VOR and DME are required if not using TACAN. An ILS and DME combination is another possibility.

In summary, ensure you understand what nav aids are required prior to commencing the approach, then confirm those nav aids are selected, identified, and set up as specified in the procedure.

IFF/SIF Code Changes

Over the past several years we have adopted the procedure of turning the IFF to "standby" prior to changing SIF codes. This procedure was to prevent an inadvertent 7700, 7600, or

Fig. 1

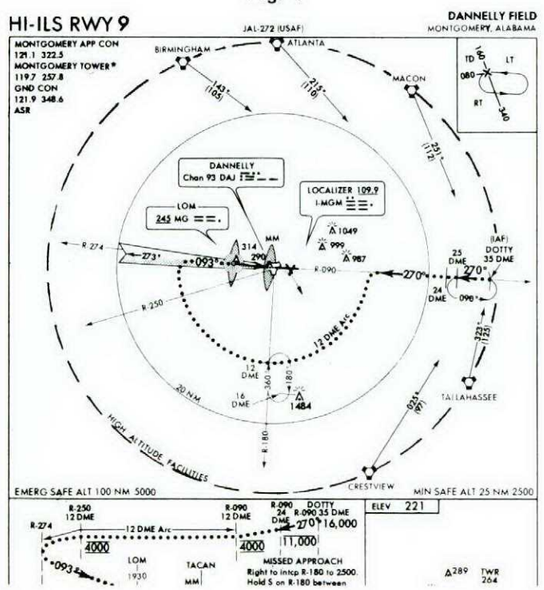
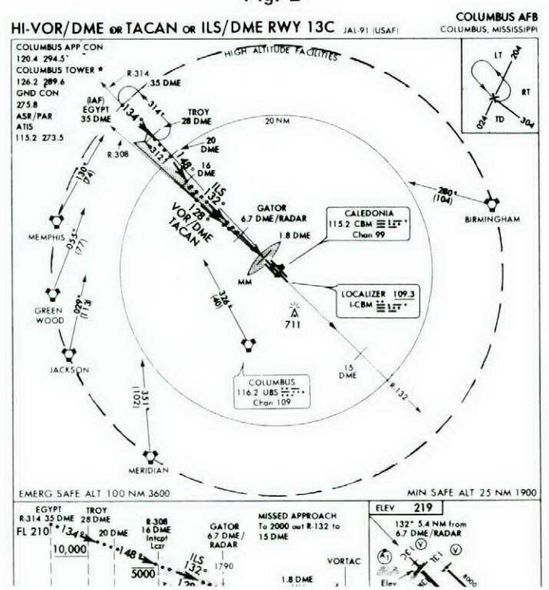


Fig. 2



7500 Squawk (Reference DOT NOTAM 1/77-ATC and Pilot Procedures, Transponder Operation, page 51).

Discussion with various control agencies in Canada and the USA indicates that this procedure is not desirable. First, in the USA all flight information is stored in a computer, including Mode C altitude information. This flight information is automatically fed into the computer from the ground radar site. Should you select "standby", even momentarily, your altitude and exact position are no longer fed to the computer and a "C" appears on the controller's scope in front of the aircraft information block. The "C" indicates to the controller that the computer is no longer receiving your squawk; that it is in the "coast" mode or simply, it is dead reckoning your position. Of course, this will likely cause the controller to ask what has happened to your IFF. Should you have the IFF in "standby" for more than three minutes, the computer will remove the aircraft information block from the scope; however, the controller will still be able to skin paint the aircraft, range permitting, by selecting his scope to raw data.

In Canada, your squawk disappears off the scope but the controller can still skin paint the aircraft provided the range is not excessive. With the advent of the JETS (Joint Enroute Terminal System) radar system in the near future, Canadian controllers will be relying on computerized information and their scope displays will be affected similar to those in the USA.

To resolve the above problems, it is suggested that aircrew refrain from selecting "standby" while changing SIF codes. However, every effort must be made to avoid dialling through an emergency squawk.

White Instrument Rating

A quote from CFP 100: "Aproach MDAS and DHS for pilots holding White Instrument Ratings shall be as in para 1 or 2 (Green Ticket), plus 300 feet." Fair enough. If your example white ticketed pilot has to file an alternate, the requirement ". . . shall be the same as for pilots who hold Green Instrument Ratings, except the MINIMA shall not be lower than White Rating Destination MINIMA". On the face of it, everything appears fine. Let us see what can really happen to an unsuspecting, relatively inexperienced White Ticket rated pilot. He knows he can file destination with Forecast Zero Zero conditions. Poor airmanship you say? Maybe, but quite legal under the rules at the moment. (A change to CFP 100 is being considered to amend the minimum weather requirements for destination.) He does require an alternate, however, so let us say he picks an airport with a published TACAN approach having limits of 500 feet and 1-1/2 mile. The alternate weather requirements for this airport are 800 feet and 2-1/2 miles (300 and 1 in excess of lowest useable). The forecast is for 800 and 3 miles. Since the alternate weather is not below white destination MINIMA, he decides to go.

On arrival at destination, the weather is reported as ceiling 200 feet and visibility one half mile. He decides he has sufficient fuel to try the approach, so he gets a clearance, along with missed approach instructions to the alternate. He flies the par approach to the White DH of 500 feet but does not break out. On over-shoot, he sets course to his alternate and rechecks the weather – still 800 feet and three miles visibility. On arrival at the alternate, he flies the TACAN approach to the White Rating MDA of 800 feet. On level-off at MDA, he finds he is still in the CLAG. After declaring an emergency he joins up on an aircraft flown by a Green Rated pilot and lands at the alternate.

On the ground, he stomps over to MET and demands some answers. The observer patiently explains that, even though the ceiling was measured at 760 feet, it is reported to the nearest 100 foot level.

In conclusion, White Instrument Rated pilots should be extra cautious when selecting an alternate that is forecasting minimum weather. Because 300 and 1 are added to approach limits in determining alternate suitability and 300 is also added to White Ticket MDA and DH, there is no margin for error. Even small fluctuations in the weather at the alternate can result in the actuals going below the White Ticket destination limits. Also, all pilots should be aware of the hazards in filing to a destination forecast below limits. This practice, although legal, is *not* recommended for short duration flights.

Comments to the editor

"SURVIVAL PHILOSOPHY" BY CAPT J.D. WILLIAMS
FLIGHT COMMENT, EDITION 3, 1977

Captain Williams states in his article "We have finally (I hope) learned to consult with two highly important groups of people. First – the experts – available at our very own Survival School and second – the potential users".

After reading a subsequent paragraph (Safe Arrival) where he states "We want to provide foot-gear which will support his ankles in parachute landings . . .", I'm afraid I must dash his hopes. As a former member of the Canadian Airborne Centre with 64 parachute descents, I believe I know whereof I speak when I say ankle support is *not* required. There are hundreds, nay thousands, of logged jumps wherein the jumper was wearing mukluks on his feet and suffered no ill effects. The surest way to break a leg or an ankle on landing is to let your feet stray apart. If you allow that to happen, the best jump boots in the world won't help you.

When one considers that a pilot only "jumps" out of necessity and in an uncontrolled situation, i.e., without regard to wind speed, aircraft speed, suitable drop zone, etc., it would seem appropriate that they be every bit as well versed in the art of a safe landing as the airborne type who jumps out of serviceable aircraft for fun, non-withstanding the fact that he does so under rigidly controlled conditions (in peace-time anyway). Surprisingly enough (although I can't quote the figures) the injury rate for military jumpers is very low in comparison to the number of jumps made.

The point is: with respect to a parachute landing – concentrate on landing technique and forget the foot-gear!

Airborne!

M.P. Carson
Captain

Comments

AEROMEDICAL INCIDENTS

Recently one of our pilots experienced a relatively minor case of decompression sickness (the bends) after a leaking canopy seal caused his cockpit altitude to depressurize to 25,000 feet. In this instance the symptoms encountered were nothing more than a sore shoulder which stopped bothering after descent below 18,000 feet.

NEVERTHELESS it is emphasized that *any* aeromedical incident no matter how apparently minor is to be reported immediately to the flight surgeon so that he meet the aircraft upon landing. Self diagnosis and assessment on the part of aircrew is not only imprudent – it is contrary to orders. Reporting of such incidents takes precedence over all other duties imagined or real, primary or secondary, once the aircraft is safely on the ground and the engines stopped.

METERS VS FEET

Without getting too specific we wish to remind our readership that certain charts, maps etc. now on issue have spot heights in METRES instead of FEET. The Metric Commission reminds us constantly of the values of going metric – but the importance of knowing which units you're dealing with is immeasureably more important to the continued existence of aviators. A word to the wise.

COVER PHOTO

The Tutor photograph on the front cover of this edition was taken by Cpl André Bard from CFB Moose Jaw.

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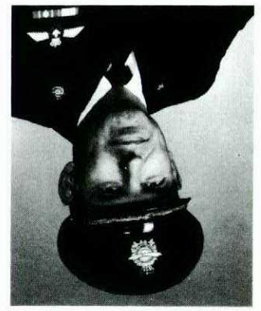
Alors que je songeais au tout dernier accident fatal, il m'est soudain venu à l'esprit que les réponses qui s'offrent d'elles-mêmes aux enquêteurs qui décortiquent les faits n'ont pas du être évidentes aux victimes des accidents aériens. Bien que les navigants aient appris les procédures d'urgence applicables à chaque situation type, ils ont maintes fois fait ce qu'il fallait précisément éviter. Une étude menée aux États-Unis sur un très grand nombre d'accidents survenus à des appareils Century Series démontre que les procédures d'urgence correctes n'ont été utilisées que dans 43% des cas et, détail intéressant, indique qu'un surcroit d'expérience n'améliore pas nécessairement les résultats. Il semble donc que les procédures d'urgence doivent devenir un reflexe acquis seulement par la pratique et qu'il est trop tard de vouloir s'entraîner une fois que les choses tournent mal.

Au cours de ma récente série d'exposés, j'ai insisté sur le fait que la plupart des accidents survenus l'année passé ont mis en cause des pilotes expérimentés. Que les autres ne se méprennent point sur le sens de mon message: l'expérience joue un rôle prépondérant dans la sécurité des vols et je ne le nie pas. Trois catastrophes aériennes survenues l'an dernier ont été directement attribuées au manque d'expérience de pilotes débutants. Un autre ''oisillon'', lui, s'est distingué en dépassant les limites structurales de son avion a en remise des gaz après une approche aux instruments. Certains prétendent qu'il n'a fait que ce qui est pratique courante dans la proffession. Si tel est le cas, notre professionalisme se détériore et l'on peut se demander ce que devient la discipline des vols.

COL. J.R. CHISHOLM
DIRECTEUR DE LA SÉCURITÉ DU VOL



As I wondered about the reasons for the most recent fatal accident, it occurred to me that what is often so clear to accident investigators who have the time to sort through the evidence must not have been very clear to the people involved. Although aircrew have been taught the emergency procedures for almost every conceivable type of failure, so often they do the wrong thing. A U.S. study of a large number of accidents involving Century Series aircraft showed that the correct emergency procedures were used only 43% of the time. Even more interesting was the fact that increased experience didn't appear to lead to improved performance. Proficiency at emergency procedures can only be acquired through practice. When faced with the stresses of an inflight emergency, the time for practice is over.

During my recent series of briefings I have stressed the point that most of last year's accidents involved experienced pilots. Lest that lead some of our inexperienced pilots to think that the flight safety message was not for them, let me hasten to correct that impression. Three potentially catastrophic aircraft occurrences within the past year were directly attributable to inadequate piloting skills on the part of pipeline pilots. Another distinguished himself by overstressing an aircraft during an overshoot from an instrument approach. It has been suggested that he was simply doing something that his peers often do. If that's true, our professionalism is slipping. Whatever happened to good airmanship?

COL. J.R. CHISHOLM
DIRECTOR OF FLIGHT SAFETY