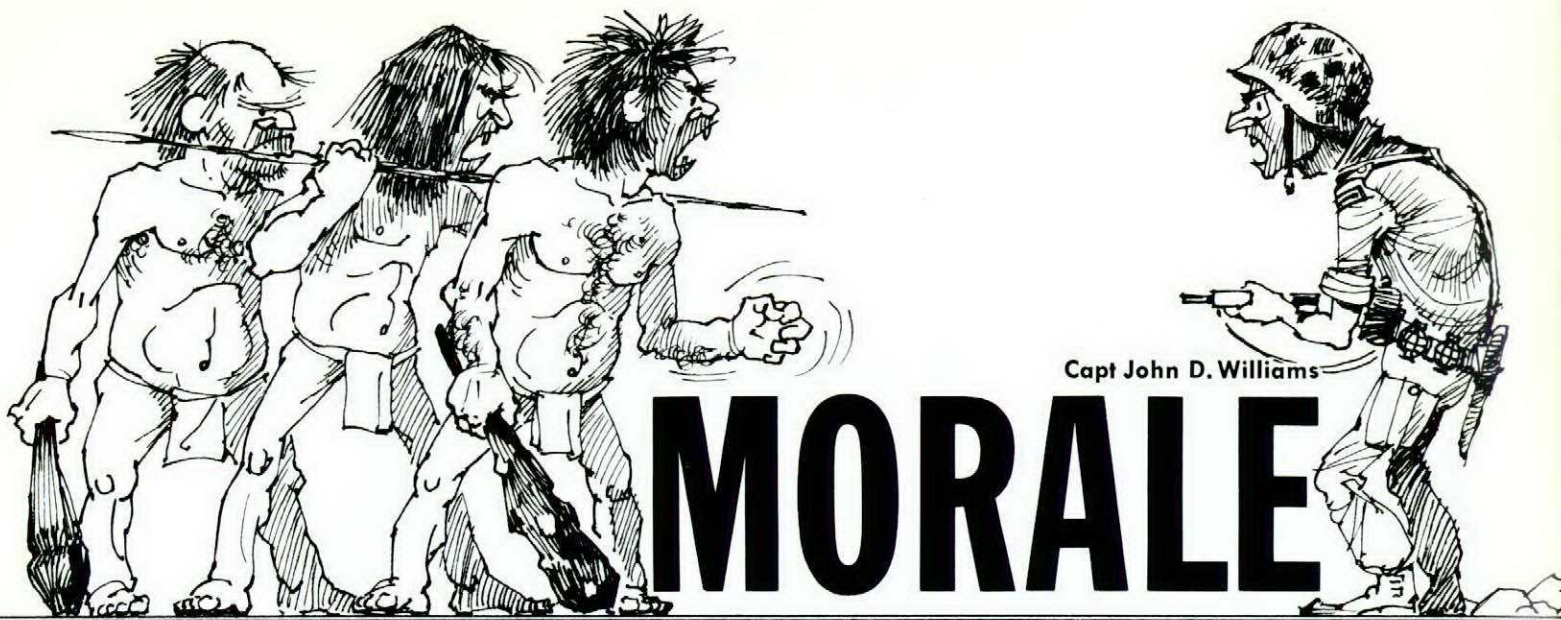




FLIGHT COMMENT

EDITION 1 1976





MORALE

Capt John D. Williams

Napoleon Bonaparte, a short chubby little chap who made quite a name for himself militarily in the nineteenth century was once reputed to have remarked that "Morale is to equipment as three is to one". This statement, like many others made casually by great figures has been handed down as gospel truth even though it is patently untrue in many situations. As a matter of fact the sheer idiocy of the statement when applied to today's circumstances is mind boggling. Your typical Neanderthal man armed with his trusty club and backed by two of his best buddies would fare rather badly against one infantryman equipped with a submachine gun, and I don't particularly care how good their morale is. Now that little scenario is a good example of reduction to absurdity, and I don't want to beat it into the ground because (oddly enough) what I want to address in the article which follows is not equipment but MORALE.

Morale may not in fact be three times as important as equipment, but it is certainly very important. We know this and accept it even though much of the evidence has to be described as stemming from "gut feel" rather than computer-programable mathematical data. We know instinctively that when morale is low, so is productivity. We know instinctively that when productivity drops as a result of low morale there is an accompanying drop in safety standards. We know it instinctively even if we cannot quantify or verify it statistically. It is a pity that our instincts apparently do not extend quite far enough. We instinctively recognize the problem or the potential problem, but we do not instinctively solve or prevent it.

What a pity nature didn't take that obvious step and include it in our initial "set"! It would have been so simple.

Unfortunately it just didn't happen that way, so the only possible solution is for us to program ourselves both as leaders and as followers. We must train ourselves just as Pavlov trained his now-famous dogs, but in our case we won't bother salivating when a bell rings, we'll just condition ourselves to respond to morale-lowering stimuli in an appropriate morale-maintaining or raising fashion. Hows that for gross over-simplification?

In actual fact it may be possible to exercise a greater degree of control over morale. The point is that if we are to affect morale we must first of all understand it. If we do not understand, the potential is great that our tampering with the status quo will have a negative affect.

If you think about it for a moment, I think you will agree that perhaps the first prerequisite for good morale in any individual is self esteem. Show me a man who is proud of himself and I will show you a winner in all respects. In the "I'm

OK, you're OK" tradeoff we need first to believe we're OK—or who cares what you are anyway? Right? I think so.

Now how does a man get that "I'm OK" feeling which is so all important?

First of all, a man has a need to feel that he is contributing something to life other than just his physical presence. He likes to think that when he departs this life something will remain behind of him. If a man is convinced that the product of his work is of lasting value, then his job fulfills the need. A major car manufacturer detected this need a few years ago and developed a unique production system as a result. They realized that they had a morale problem and that their workers had lost their sense of contribution. After all it is difficult to wax eloquent about your job if it involves only smashing the left front hubcap of three hundred cars per day with a rubber mallet to ensure security. What did they do? They took a team of hubcap smashers, transmission installers and upholsterers etc., retrained them, and said "Now you are automobile builders, go forth and build."

Now our former hubcap smasher can say to himself not "I smashed every hubcap ever seen on that model car" which isn't terribly inspiring at any rate but "My team built two cars today" which is a pretty impressive achievement in anybody's eyes, and most important of all, in his own.

"Yes", you say, "but what about the company? I bet they don't make as many cars."

You're right, they don't, but the cars they do make are recognizable better, their are fewer labour problems in the plant, absenteeism is down and profits are up. What, after all, was the goal? Looks to me like the sense of contribution has paid off.

After a man is convinced that he is making a contribution he acquires a secondary need. It becomes important to him that he be recognized as a contributor. Now he can be recognized in a host of ways but nothing is more gratifying than public announcement. Companies which place newspaper ads announcing the elevation of Joe Schmedlap to executive status are catering to this universal need. The company pays a lot of money for that ad which helps Joes ego a lot and which in the end reaps great benefits for the company. You see the same thing in supermarkets who put up a picture of the "employee of the month", and in drive-in restaurants and in factories. Are we doing the same thing for our man? I hope so. After all it only costs eight cents to send a photo and writeup to a mans hometown paper—and the base paper is within walking distance.

So now our hypothetical man is OK in his own view, and is also recognized by his peers. Unfortunately we are building

a monster because soon other needs will arise, needs for increased responsibility needs for promotion etc. We must fill these needs or we are going to create frustration, and that frustration is going to lower morale. Well, not really. Fortunately most people have a pretty accurate estimate of their own potential pretty early on in their lives. Sure there is only one Prime Minister at any given time while probably twenty men seriously aspire to the position, but nature has avoided the untenable position of twenty million aspirants to one job, by giving us all different goals matched to different levels of achievement. The important thing is that a person be given a fair shot at his own goals. If you always dreamed of being a Warrant Officer and if you meet all the requirements but get stopped at Corporal you'll be frustrated. If you always wanted to be CDS but got stuck at Captain you'll be just as frustrated, particularly if you seriously believe that you had the necessary qualifications and just didn't luck in.

Here comes the crunch then. Not everyone is going to achieve even his (or her) realistic goals, but still we have to avoid the pitfalls of frustration and reduced morale. How?

Have you ever taken the time to study any of the many outstanding cases of self-sacrifice? If you do, you will discover that people who make their own goals and aspirations subservient to those of a greater cause generally do so out of a highly developed sense of purpose. I say generally because there are those who sacrifice themselves out of sheer masochism, they have a martyr complex.

Sense of purpose is terribly important in a military environment. Perhaps the best available example might be found by examining the American participation in the war in Vietnam and comparing it to their efforts in World War Two. The American soldier fighting in any theatre of action after the infamous attack on Pearl Harbour could be depended upon to turn in a magnificent performance. Why? Because he had a sense of purpose. He knew that there was an important job to be done, a job which he personally recognized as being necessary and important. There was throughout the entire society a consensus that the job had to be done. Those who did it or aided in it could be proud and those who shirked their duties were objects of disdain. Yes, there were many acts of individual heroism in Vietnam too, but the consensus wasn't there throughout the populace and the eventual outcome was probably inevitable. The sense of purpose just wasn't there, or perhaps the purpose was mis-stated. The combatants were doing an unpleasant job when in previous conflicts they had been embarked upon a crusade. Crusaders will make sacrifices that workers wouldn't consider.

Maybe thats what we need—a Crusade. Not a war mind you, just a crusade to engage in, a quest to dedicate ourselves to. There doesn't have to be an enemy—just a purpose that goes beyond bringing home the weekly paycheck.

Five hundred years ago there were large groups of men who described themselves as "Crusaders". They were easily recognizable by the red crosses which were conspicuously displayed upon their shields and emblazoned upon the garment which they wore over their chain-mail. When a man adopted that marking he became a "crusader", dedicated to what was then considered to be a worthy cause, a cause important enough to die for.

A Canadian who take up the green uniform symbolic of membership in the Canadian Forces is usually much the same sort of person as was the crusader. He seeks adventure, he seeks the opportunity to contribute something to the nation and the world, he seeks a sense of membership in a unique fraternal organization the direct ancestors of which have been grabbing headlines ever since the printing press was invented. Just consider what you yourselves thought you were joining. That's what he is seeking.

Now lets discuss what he may in the worst of instances get in response to his seeking.

First of all he gets all the normal hassles which make up

life in North America in the twentieth century—taxes, high prices, spiralling inflation and uncertainty. Then we throw in the "exigencies of the service" by which we mean frequent moves, sometimes isolated locations, separation from wives and children for lengthy periods, physical demands both in training and later service which rival those imposed upon professional athletes, and operational conditions including weather, hours, or field service conditions which would bring a lot of SPCAs into action if it were animals involved instead of people. Occasionally people even shoot at us.

"Fair ball" you say, "he knew all that when he joined."

Right. But are we attempting to do all we can for him to keep him motivated, to keep his frustration level low and his morale level high?

How many commanders get the troops together after a tough exercise or operation and praise them personally for the efforts put out. I know two who made this a habit. One was Montgomery and another was Patton. Sure they differed immensely in style, but they knew about leadership, they knew about morale—and is it just a coincidence that they knew about winning?

How many of us have known excellent technicians who served faithfully and efficiently for twenty-plus years and finally made Master Corporal—and heard about it by telephone from the orderly room? Shouldn't that mans CO have arrived with those long awaited hooks in hand? Did he really have something more important to do?



How many of us know pilots who after nineteen years of formal education, years of pilot training and flying experience acquired at a cost of literally millions of dollars arrive on a squadron and are assigned the weighty task of "canteen officer" responsible for reordering cigarettes and stocking the refrigerator? What an insult to any man worth his salt.

We owe it to a man to give him a job of which he can be proud. Having given him that job we owe him the chance to do it, on his own without some supervisor breathing down his neck, the chance to do it and be proud within himself. Then, if he does a good job consistently we should let him know that we are pleased with his efforts, and we should publicize our pleasure.

Furthermore we should whenever possible try to remove the sources of petty irritation which have no connection with the task at hand. Operating in the field for instance we expect poor working conditions and put up with them as necessary, but in a fixed base situation there is no excuse for poor lighting, heating, or ventilation facilities in a work area, particularly not if recreational facilities are perfect. It is possible for most jobs to be pleasant enough that men actually look forward to going to work. Are we working in that direction ourselves? It would be difficult to justify an answer of "No".

Of course it is not just physical working conditions which count, in fact the mental or psychological environment is

probable even more important. There are happy and unhappy ships, tank crews, squadrons, and offices. Usually you will find that the happy organization has well defined goals, clearly divided and assigned tasks, and realistic working procedures. Responsibility is shared, as is the credit when a job is completed. Unhappiness begins when the organization becomes "They" instead of "We". The sense of being "in" the organization rather than "working for" it is a unique asset which the military can and should offer its members. Team-mates or family members will go a lot further out of their way than employees.

All of this so far is just the lead-in to what we have to do both as leaders and followers to keep up morale. These precepts apply at all levels so examples will be spread across the entire spectrum.

1. Define the Purpose.—The purpose of the Canadian Forces might be "to maintain a capability to defend Canada", the purpose of a tank crew might be "to maintain a capability to operate our tank in conjunction with the others in the troop". Whatever the purpose is, if you can't state it in words it is obvious to me that you can't carry it out (because you won't recognize it).

2. Set Goals—There are measurable areas in any task. A fighter pilot might set as a goal a certain gunnery hit percentage. Attaining this goal would be cause for pride, missing it would be an indicator that work is required. Either way he would know how he was doing. All of us need to know how we're doing, how we "stack up", and most if not all of us will work hard to "make the grade", but we have to know what the grade is.

3. Recognize Achievement When a unit, a sub unit or an individual achieves something laudable, then lay it on. We do this naturally in training our dogs, but forget that praise helps in training or leading humans. Give a man a good PER, a commendation or a handshake, but let him know you appreciate his efforts.

4. Exercise Responsibility If you as a leader find yourself tasked with something of which you are capable then do it and share the glory when it comes, but conversely if the task is impossible admit it. Don't blame yourself or your men for failing at an impossible task but do blame yourself if you could have had help or additional resources and failed to ask. Remember that you may climb a short distance on the shoulders of your subordinates but for the long climb they can only boost you if they're climbing along with you. They may be responsible to you but more important you are responsible for them, not just their productivity but their well being as well.

If you as a follower find yourself faced with a problem you have a responsibility upwards to make every effort to rectify it, and a right to expect all possible aid. Only when the lines of responsibility function both upward and downward will any system work.

Since virtually everyone splits his time between the leading and following positions it is worthwhile periodically to "put yourself in the other fellows shoes. We often find ourselves criticising either upwards or downwards an action which we ourselves would have taken were we in the same position.

If you happen to be a leader right now, take a long, hard look at yourself. Are you the sort of person you would like to follow. Could your men introduce you with pride as the man they work for, or might they be a little embarrassed? Think about it. Are you living up to your responsibility to provide them with the leadership they deserve and expect. If you're a follower, are you developing into the kind of man who rightfully is a leader?

5. Be a Leader. "Leadership is the art of directing human beings. It is not necessarily a God-given trait, though some

individuals are predisposed by environment to the practice of some of the qualities essential to leadership; and there are others who have proved that by honest effort, cheerful self-sacrifice, and careful study of human nature, the art can be acquired.

What are the stimuli which influence the human mind and soul?

Well, there is honesty, first of all. Men like to feel that their leader is a man whom they can trust. He must be intelligent and professionally competent, for men are quick to detect the spurious leader who doesn't know his job. He must invariably be just, forceful, and courageous, for human beings respond to fairness, respect decision, and admire courage.

He must be humble in that he recognizes that fundamentally all human beings are shaped from the same mold. If he is blessed with wisdom he will be tolerant of the foibles of mankind, and be patient with individual eccentricities.

If he possesses intuition he is fortunate indeed, for often he can anticipate the moods of his charges, and turn their thoughts into channels advantageous to the common weal. But the quality most precious to the leader is loyalty, and if he would receive it from his subordinates he must make it part of his lifeblood, practicing it in his relations with his juniors, no less than with his seniors.

He must remember that lethargy and procrastination are dominant human frailties which he must cast out forever from himself and continually check in his subordinates.

Finally, the true leader practices the precepts which he advocates. He is devoted to the interests of his men, and he subjects himself to the same hardships which they are required to endure.

And out of the crucible he finds that there has been forged a spiritual bond between him and his men which will enable them, collectively, to accomplish seeming miracles."

Colonel E.F. Carlson United States Marine Corps.

6. Remember. In some ways membership in the Canadian Forces is an act of faith pure and simple. As in any other large organization there are periods of famine and periods of plenty. When all else fails (as it may appear to do from time to time) remind yourself that we trace as our direct ancestors three organizations which earned individual immortality through achieving the impossible under circumstances of adversity we have not dreamed of. The Royal Canadian Navy, Canadian Army, and Royal Canadian Air Force are our forbears and with lineage like that no organization can go far wrong. When things get a little rough say that to yourself and "psych yourself up". Nobody ever promised us a rose garden. There are all manner of "seeming miracles" to be accomplished and we happen to be the organization tasked with accomplishing them. No man can fail to take great pride from being handed a task which many would consider impossible, because he is being told, however subtly, that he is considered capable of achieving the impossible. If that doesn't fill up your bag of self esteem it is hard to imagine what would.

Remember that in 1938 armed forces seemed pretty unnecessary to most Canadians and that by the fall of 1940 a man who had always recognized their value was stating that "Never before in the field of human conflict has so much been owed by so many to so few".

Remember that we are today's "few"—if need be, and tomorrows also.

Remember that—and you'll never lack for sense of purpose. We *have* something to which we can dedicate ourselves, and we *are* embarked upon a crusade whether we always recognize it or not.

QUESTION: What have *You* done for morale recently?
If you're not part of the solution —you're part of the problem.

If you think statistics lie - SMOKE!

by Maj R. C. Rud, Base Surgeon
CFB Portage la Prairie

Some Interesting Statistics

The average smoker takes 8 years off his life span and annual deaths in Canada related to smoking are estimated at 30,000.

Not only does the smoker die earlier but his productivity while alive is below average. In the U.S.A. 77 million work days are lost each year due to illness associated with smoking, and; the smoker spends 10% more time than the non-smoker when recovering from illness.

The average smoker starts experimenting at age 9-11, inhaling by 14 and is hooked by 17. If you have smoked a package a day for 10 years, your cigarettes have cost \$2200, interest on this money is \$1100. The total cost of the habit, so far, is \$3300. But the interesting fact is, if you stop now, and invest the money you spend on cigarettes, at today's interest rates, in 40 years you will have saved \$60,000.

How to Stop

Since 1964, when the Surgeon General of the U.S. reported officially the hazards of smoking, about 2 million Canadians have quit the habit. About 10,000 of them were doctors which proves that anyone can stop.

There is no magic medicine to help you quit. The commercial aids to stopping may be used as they are not likely to be harmful.

Group therapy is a very useful adjunct to stopping. If you can get together with several friends who want to quit, swap stories and compare notes in daily session you will find some benefit. In addition breaking old habits associated with smoking is essential. Avoid coffee for a few days. Stay away from that old armchair. Avoid smoking companions for a while. It has also been found that large intakes of fruit and fruit juices in the first few days will help you break the habit. Oh yes — also try to avoid spicy foods and alcohol. The physiological effects of the need for nicotine will wear off in about three days but you will feel that psychological urge for months — so beware.

Look for a stop-smoking clinic in your area or ask your MO or Flight Surgeon to get one together. The Seventh Day Adventist Church Five Day Plan is one of the most successful in operation today.

One word of advice. If you choose to stop — ensure that you mean it and look at yourself from now on as a *non-smoker*. Don't carry smoking supplies, don't smoke O.P.s. — remember non-smokers just don't smoke.

The statistics and facts put forth above are true. They are scientifically sound and have been documented in some of the best medical literature. Cigarette smoking is not a gamble. Every smoker is injured to some degree with every cigarette. Smoking kills some, cripples others and gives all users far more than their share of illness. If you smoke you are worth \$8000 to the tobacco company. How much are you worth to your family and yourself? The young smoker not only pays for his own poison but the final statement on his bill may read:

"Debit: Your health and perhaps your life."¹

Ref: 1 The Truth About Smoking — W.R. Spence M.D.

Man likes to think of himself as a rational animal, however, it is more true that he is a rationalizing animal, motivated to appear reasonable to himself and others. This is the thesis of an article written by Dr. Elliott Aransen in a paper entitled, "The Rationalizing Animal".¹ It is a very interesting article and describes how people can convince themselves that wrong, inappropriate behaviour or dangerous behaviour is reasonable and correct. For example, whenever a person simultaneously holds two inconsistent ideas, beliefs or opinions, he will rationalize. Such a dilemma faces the smoker who is confronted with evidence that smoking causes cancer. He will either be motivated to change his attitudes about smoking or be forced to rationalize his smoking habit. He may do this by reading a conclusion that the studies are no good, he may point to friends (if Sam, Jack and Harry smoke, cigarettes can't be all that dangerous). He may grasp at straws to support his rationalization that he should continue smoking, for example, he may quote that if Churchill could smoke twelve

huge cigars a day and live to his 90s, then what harm would twenty small cigarettes do. This is rationalization, and is done to support more bad habits than smoking.

The reaction of a person who is faced with the dilemma of changing his attitudes, behaviour, or actions because he has got evidence that they were stupid, dangerous, or inappropriate is to admit his error, or to rationalize. People rationalize by seeking support of their ideas or their actions. You can probably think of two or three times yourself when you made a gaff, lost your temper when you shouldn't have, or tried to blame a mistake or oversight of your own, on circumstances (or heaven forbid, on someone else), you probably convinced yourself that time, only to realize later that you were wrong.

In the flying business, rationalizing bad flying habits can be lethal. Are there any obvious cases of pilots who rationalized their mistakes or wrong attitudes as a virtue? There are probably many. The following narrative, which could be entitled, "Thoughts of a Duty Officer", illustrates one type of behaviour

man's rationalizing motives and

FLIGHT SAFETY

by
Maj C. Crymble DCIEM

which was the theme of five accidents in the CAF in the last five years.

"... yes, he is a Serra Hotel Jock, at least in his opinion, at any rate, he always does well on proficiency checks. He is a character, but sometimes I just can't stand his big mouth, the way he talks down to other pilots about how great an air combat pilot he is, and how other squadron pilots are lacking in the real aggressive spirit needed to be as good as he is. But in all truth he is pretty good. You can't really argue back at a guy who just might be as good as he thinks he is; maybe the best thing is just to ignore his comments and laugh it off. He really does scare me though with the stupid stunts he pulls. Like last month when he scraped the engine cans on take-off after tucking the wheels in and flying the length of the runway at three feet. He was caught out that time and the squadron commander told him to "cool it", but I saw him laughing it up in the bar afterwards with the boys so I don't think it bothered him at all. The fact is, I feel he pushes his image just too damned hard. I have an awful feeling that ... "What was

that? — The crash bell — Who was it? — Christ, just as I figured ...".

Rationalizing may have been at the root of the accident. The young pilot has the manual dexterity to be a good pilot, but not the maturity. Because of his self-created image and his immaturity he was continually proving himself to his peers. He was known for his unprofessional attitude and several foolhardy flying escapades. He could rationalize to himself that his flying demonstrated his aggressive pilot image. The small miscalculation on take-off when he scraped the aircraft was, hell, nothing to get excited about. Who was at fault? Obviously the pilot lacked the maturity and sense of responsibility he should have had; but what about the squadron commander, flight commander and flight surgeon who failed to counsel or reprimand him severely enough in the past. Early and appropriate reproof of this pilot could have saved a lot of grief. Have you got a Serra Hotel Jock like this on your Squadron?

¹. Psychology Today, May 1973.

"All is Not Well that Ends Well" or "how are you fixed for aids?"

by LCol A. C. Brown, Commandant 1 CFFTS

Following is a resume of an in flight situation with which I was faced following the failure of several aircraft components. The problem was further complicated by contributing factors and, while it had potentially disastrous connotations, the story ended happily. But, in fact, while this story may be ended, the real problem lives to perhaps face us again in the future. Well emphasized is the fact that you cannot have too many nav aids, however, you may have too few.

On the weekend of 19 Sept 75 I was authorized to fly a four legged cross country training mission from Cold Lake; departure was planned for Friday morning with return on Saturday afternoon. My intended route of flight was: Cold Lake — Malmstrom AFB — Hill AFB — Fairchild AFB — Cold Lake. At approximately 1100 hrs local on Friday I took off in my assigned aircraft, 116844, which was "clean" configured. I proceeded according to my itinerary to Hill AFB where I spent the night. This portion of my mission went without incident and in fact was rather enjoyable since the weather was clear for the duration. It was not until early in my third leg that irregularities began to occur.

For my return to Cold Lake, the first leg was to Fairchild via Boise Tacan (B01 80) at FL 310; time enroute was 1 hour 03 minutes; fuel on board was 1 hour 29 minutes; fuel reserve over destination was 1104 pounds; the weather over the entire route was clear with maximum wind of 60 K, and there were no significant notams. After filing my flight plan, I soon started, taxied, and received the following clearance: "Cobra 20 is cleared as filed; maintain 7000 feet. Expect FL 190 within 10 miles and FL 310 within 50 miles. Takeoff runway 14, contact departure on 290.3 mcs. Squawk _____".

At 1203 local, I took off, turned right and established radio contact with departure control. I was requested to maintain 250°, to squawk ident several times, and to recycle my transponder; all this I did, and following several short transmissions, I learned that for reasons unknown departure could not observe my transponder on radar. Following a further delay and several SIF/IFF selections, I was cleared to FL 190 and directed to contact Salt Lake Centre. Upon contacting Centre, I was again asked to confirm my squawk, to recycle, and to change squawk. It soon became quite apparent that my IFF/SIF was malfunctioning.

Up to this point I had been steering a heading of 250° at fl 190 and was well south of my required course of 296°. I was then directed to several other centre frequencies and controllers, asked to make various IFF selections, and was asked for my position off of the Hill Tacan. After several check turns for possible radar identification, I ended up on a heading of 360°, well north of course, and approximately 100 miles from Hill. Once again I was asked to change centre frequencies and to state my position relative to the Malad Tacan (MLD 121). My Tacan would not lock on to MLD and so I advised the controller and reattempted Hill. When this also failed I attempted Boise, also with no success. It was now apparent that not only was my IFF unserviceable, but my Tacan was out as well.

I quickly gathered all the facts: I was north of course and somewhere beyond 100 miles from Hill; I had been airborne

for some 20 minutes; I was at FL 310 and my airspeed was 350 KIAS as opposed to M.9 as I had planned and therefore my log card was practically useless. What I didn't know was my exact location.

Realizing that centre radar could be of little assistance since they did not even have as much as a "skin paint", I turned to a heading of 290° to attempt to regain my original course and hopefully locate Mountain Home AFB which was just to the south of Boise. I also squawked emergency as a last hope of gaining rader identification.

With nothing more than radio contact, I proceeded westward for approximately another five minutes when I observed an aerodrome which was just to the south of my course. Owing to the general runway direction and length and to the proximity of the field to a city I suspected that I had located Mountain Home AFB. I quickly advised centre of my find and advised that I was turning left, descending and leaving frequency.

After attempting radio contact with tower, and after flying over the field VFR, I realized to my disappointment that I had not found Mountain Home, but some civil aerodrome which had a DC 9 parked on the ramp, a t-33 mounted on a pedestal, a long runway and little else. A guard transmission soon put me in contact with "Burley Radio" who in turn directed me to a tower frequency of 398.2. Upon contacting the tower, I learned that I was over "Twin Falls City, Utah", that the runway was 7149 feet long and that no services were available.

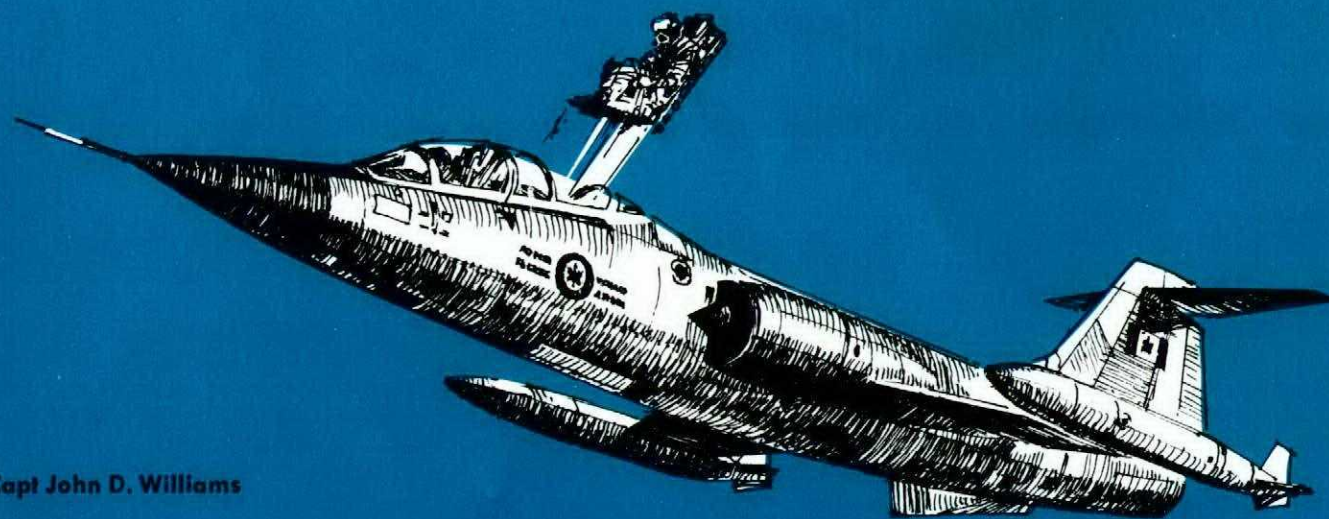
At least I now knew where I was and I still had 2000 pounds of fuel; so I climbed to 7000 feet and I recontacted Salt Lake Centre with my exact location. When they were unable to establish radar contact, I climbed to 15,000 feet and again reported when I was directly overhead the airport. When they advised that they were still unable to establish contact, I reported that I was setting heading for Mountain Home AFB (280° for approximately 80 miles).

Finally the heat is off; but no, Centre advises that Mountain Home is closed due to runway repairs; they also request my intentions. Following several transmissions, it was established that in the case of an emergency, the runway at Mountain Home could be opened in approximately 10 minutes.

I assured the Centre that I was experiencing an emergency and that I would proceed to Mountain Home. Approach control picked up a "skin paint" which they identified as my aircraft with a check turn and I was given a PAR to Runway 12. At approximately 1255 I landed at Mountain Home with approximately 900 pounds of fuel remaining.

End of story — yes, this one, but can it or will it repeat itself? If it does, what are the guarantees? Will the weather be clear? Will the ending be a happy one?

The story overall makes for good bar talk, but is this enough? Are there lessons to be learned? I believe so. Firstly, a topographical map on board the aircraft in this instance would have been of value since the weather was clear and it is therefore a worthy consideration for all flights. The main point, however, is that cases like these would not even occur if at least one more nav aid were available in the aircraft. ■



Capt John D. Williams

Flight into danger revisited

Remember the old Arthur Hailey novel in which a wartime P-51 pilot who hadn't flown for ten years or more found himself at the controls of a North Star after the pilot and co-pilot were stricken with food poisoning? Remember the tense scenes in which the poor guy was briefed by a groundborne pilot on the operation of the aircraft systems which would be required for a safe recovery of the aircraft and its otherwise doomed passengers? Well, if you do, then perhaps you'll be interested in taking the whole thing one step further.

Picture if you will a dark and dirty day in Baden Soellingen with cloud from the ground up to thirty thousand, Forget the North Star and picture instead the cramped cockpit of a CF104. For your hero pick a wartime Halifax pilot who hasn't flown since he was shot down thirty years earlier on his 18th mission over occupied Europe. What do you think his chances would be of getting onto the ground in one piece? Read on and you can join the thousands who will marvel at our own.

FLIGHT INTO DANGER

The drama begins at FL300 overhead Baden when the rear seat occupant of the CF104D aircraft being used to give a demonstration flight to the former RCAF pilot is accidentally ejected from the machine which is otherwise fully serviceable and has a full fuel load except for the fuel expended during taxi, takeoff and climb. The front seater who has received a cursory briefing on the cockpit and a detailed briefing on the operation of the ejection system considers the possibilities and decides to stick with the plane. Oddly enough he has been in somewhat the same situation now in two consecutive flights spaced thirty years apart. Last time it was in a flak damaged Halifax over France, when our hero Les

Lauzon as aircraft captain in a 432 Sqn crew had given the order to bailout. When one of the gunners was unable to get his chute Les gave him his own and forced landed the four engined giant. Surviving this experience he joined and fought with a resistance unit until captured by the Gestapo three months later. A DFC awaited him upon his eventual return to England.

So much for flashbacks. Here we are with our 104 level at FL300. What to do?

Fortunately the departed pilot had left the UHF on Baden terminal frequency. Therefore despite his untimely departure communication was possible. Les pressed the mike button.

"Baden control this is Tiger 55, come in please, Over."

"Five five this is Baden, go ahead."

"Baden, my pilot appears to have left me and I'd like to speak with someone about flying this thing. Over."

"Five five, I think I must be reading you incorrectly, say again please. . ."

—There follows a discussion in which circumstances are made clear to an unbelieving ATC type. A qualified pilot is rushed to terminal control complete with cockpit photographs and a chaplain or two, and the now familiar dialogue begins after appropriate introductions are made and the possibility of ejection turned down by a determined Lauzon.

"Les do you see a large grey and black globe in front of you in the upper middle of the control panel?"

"Yes, over"

"That is your compass and artificial horizon. Keep the little airplane sitting wings level on the horizon, thats where the grey meets the black. Oh by the way, forget about "over." We don't say that anymore."

—There follows a further discussion in which the operation of throttle, flaps, speedbrakes, and other such goodies are explained, and a refresher course in instrument reading is run at a frantic rate. This being done, a brief handling lesson is carried out, featuring speed changes, turns to specific headings and descents to specific altitudes. Lauzon proves to be an apt pupil. His flying, while initially rough shows increasing smoothness with time. His confidence in his own capability increases. All of this takes about thirty minutes, then the decision is made. He is ready to attempt a landing.

"Tiger five five you are cleared to the airport for a straight in precision radar approach. You are presently set up at forty miles and two thousand feet. Because of special circumstances you need not repeat all instructions, merely reply to specific questions. Maintain heading 220, set fuel flow 3300 pounds. With takeoff flap as you have selected this should give you a speed of 260 knots. Can you confirm that?"

"Yes, I'm reading 255 right now"

"OK then, increase the flow to 3500"

"Tiger five five you're lined up on the extended centreline, heading appears to be OK, select your speedbrakes out now and descend to 1500 feet. Just ease forward gently on the stick and begin your leveloff at 1600 feet. Tell us when you're level."

Seconds later the quiet voice "Five five is level".

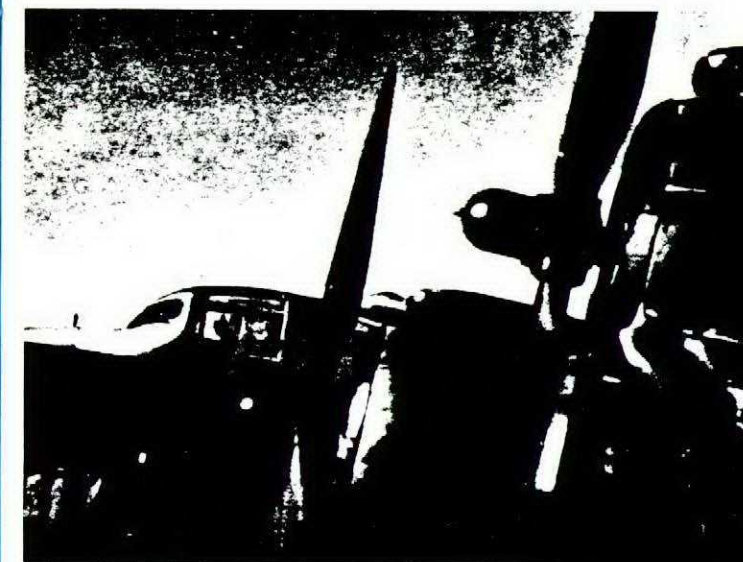
"OK Les, you're doing great! Now select your speedbrakes in and you should still have about 260 knots."

"Yeah"

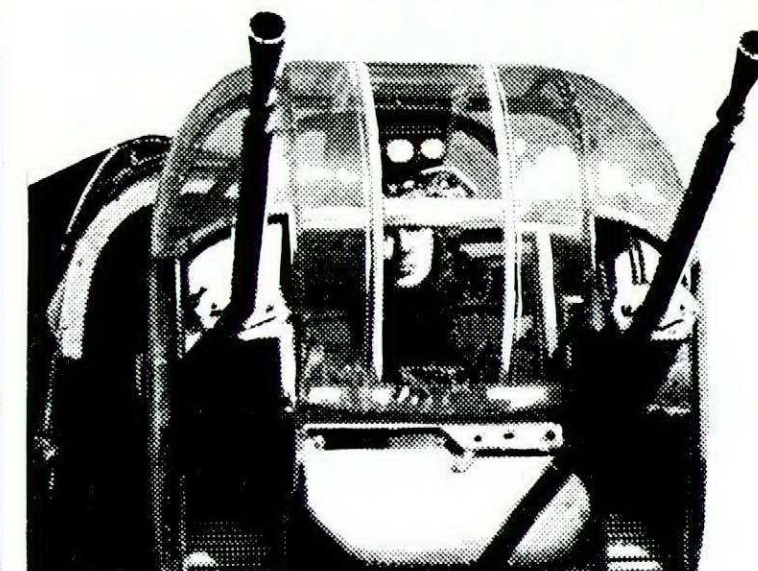
"Now Les we're going to lower the gear. You remember the lever over on your left? The one with the plastic wheel on the end? Just push forward on the little knob and at the same time lower the lever. Remember to keep the plane straight and level on the artificial horizon."

"OK I've selected the gear and I now have three green lights".

"Thats fine Les, now increase the fuel flow to 4500 and you should steady out at about 240 knots plus or minus. You are about twenty miles back now so we'll just maintain head-



Les Lauzon, pilot



Bill Bridle, tail gunner



ing and altitude and review the situation. Ten seconds before you hit the glidepath I'll warn you and I want you to put the flap lever fully down. As soon as you've done that increase the fuel flow to 5500. From then on we'll just leave the throttle and you can just watch your altitude control and heading. When you break out of the cloud at the bottom of the glidepath just continue your descent. When we say you're approaching touchdown just put out the speedbrakes and raise the nose about one degree on the artificial horizon. Don't attempt to hold it off for a smooth touchdown. As soon as you touch, cut the throttle to idle and pull straight back on the drag chute handle. Keep straight by differential braking and don't be afraid to step on those brakes pretty heavily after the drag chute is out.

"Sounds good to me. I sure hope you've got the firetrucks out."

"Sure we do Les, but you're not going to need them. Now, you're just eleven miles back so select your flaps down and set 5500 on the fuel flow. The plane will try to climb a little so watch your 1500 foot altitude."

"OK Les you've intercepted the glidepath, ease the nose down about five degrees and then back up two. That'll get you started down."

"Yep, the altitude is starting to unwind. Looks like about 800 feet per minute."

"That's good, just hold that nose attitude and turn right two degrees, you're drifting a little left of centre but your descent is perfect. OK that seems to have killed the drift, hows your speed?"

"About 185 knots."

"That's good Les, just ease the nose up a fraction of a degree and try to hold it there. You're just a touch low at five miles. You should break out of the cloud in just a second or two, but continue to follow our instructions all the way down."

"Sure will fellow, I have no theories of my own on this little bird."

"Alright now you're back on glidepath and on centre-line. Hows the speed?"

"180 knots and I can just make out the runway lights in the mist."

"Real good Les, you're two miles back and nicely lined up, just continue this descent and make your own corrections for heading to stay in the middle of the runway."

"Alright Les, you're over the lead-in lights, put out your speed brakes now. Now bring your power back to 90% and ease your nose up just a touch."

"I'm on the ground"

"Pull that drag chute handle, chop the throttle and stop on the runway. We'll be right with you."

And so it went that fateful day in Baden. Les Lauzon who hadn't flown anything for thirty years recovered his 104 without incident under IFR conditions. In fact he later stated that the letdown which he carried out was not nearly as hairy as many he'd flown in World War Two. The instrumentation is so much better in the 104, and of course GCA was not available in those days. Even radio communications were apt to be quite unreliable.

One thing which does enter into the equation of course is the fact that the proverbial "pucker factor" was absent. In reality this drama took place in the 1 CAG flight simulator. Les Lauzon never really left the ground throughout the flight, but the remainder of the story is totally accurate, just a little condensed. In less than an hour of "flight time" skills that had

been buried for thirty years were resurrected, dusted off and put to use in a most demanding situation. Frankly those of us who watched from the "ground" were quite convinced that he could have carried it off in the "real thing" just as well as he did in the sweatbox. It says a lot for the kind of man we had flying for us in those days, and quite probably for the calibre of training they received.

Incidentally, we tried the same little test an hour or so later with another Six Group veteran, Bill Bridle who was also visiting at the time. To add a further complication to the matter Bill was a tailgunner, not a pilot, and he also hadn't flown as a crewmember for over three decades.

After we managed to convince him that he had to sit facing the front in this particular machine and then strapped him in and closed the hood so he couldn't turn around he adapted well to the pilot role. He too took off, flew around, and carried out a GCA full stop landing without incident. Not bad for a guy who did his 34 combat trips in the back of a Halifax flying with 415 Squadron from the Tulthorpe and Eastmoor satellites of the RCAF base at Linton-on-Ouse. Bill admitted that there was a lot to be said for a view out the front window, but that personally he preferred sitting behind his four Brownings and covering six.

Editors Note:

Les Lauzon of Scarborough Ontario and Bill Bridle of Peterborough Ontario visited Baden in the summer of 1974 as representatives of the thousands of RCAF aircrew and groundcrew who took part in the Normandy Invasion of 6 June, 1944. Both were airborne over the invasion area on the night of June 5-6 and took part in subsequent operations in support of the ground troops after the beachhead was established. Les was shot down and began the second phase of his war on the night of 13-14 June 44.

While in Europe they attended the 30th anniversary of D Day memorial services in Courseulles sur Mer before travelling to Baden where they addressed the #4 (Group Captain Buck McNair) Wing of the Royal Canadian Air Force Association.

T33 - ENGINE ACCESS DOORS ARE A PREFLIGHT ITEM - EVEN IF THEY ARE COVERED WITH SNOW

A review of last winter's incidents reminds us that a pilot was deluded by winter snow into believing that the upper engine access doors on his T33 were securely fastened. He stated that the door area was shaded by the raised canopy and was covered with approximately one-half inch of ice and snow at the time he did his preflight. The pilot did not check the doors for security and on descent to the recovery base, the doors departed the aircraft. Only 3 of 48 fasteners remained fastened in the fuselage. There was no damage to the other 45 fastener holes. This time there was no other damage to the aircraft; next time, the pilot might not be so lucky.

Major B.C. Bernet, CF
USAF Study Kit

THE NARROW PATH OF GOOD JUDGMENT

There was a time when "aviator" and "daredevil" were synonyms. A man who flew was, in the public mind. Some of this old swash-buckling attitude still remains, but only as a gently tradition, and only on the ground. The aviator of today is a professional man.

What caused the change of the aviator in the public mind from the daredevil to the professional? The answer lies in the path of good judgment. The aviator has by keeping on this path, proved to the world that he is able to stand side by side with other professionals as one of them. He knows that the path is a narrow groove which has no edges to prevent one from wandering out. He understands that the outline is not clearly defined, but is shadowy, hazy, and difficult to distinguish. Although the path is straight, he is fully conscious that it is, more often than not, clearer through hindsight than foresight.

Specialized training and experience help to give the skill to do the job after a decision has been made. Also through training and experience the aviator is able to gauge his skill and know his own limitations. But the old stunt fliers had skill too; so there is something else needed to remain within the path of good judgment besides skill alone.

Responsibility: Certainly a doctor has responsibility; so does the aviator. He always has the responsibility for his own life, of course. The pilot of an aircraft with passengers has several lives in his care, and the single-engine pilot is expected to conduct his flight in such a manner as not to endanger the safety of others.

Aside from the human responsibility, there is also the very considerable expense of today's aircraft to think about. The improper decision of an aviator as young as 20-21 years could cost more than a million dollars. Responsibility, then, is a sobering element that tends to keep an aviator within the path of good judgment.

This element is not one that is suddenly thrown upon the shoulders of a young aviator. When a student has earned his medical degree, it is not because he has on some certain day

become an expert in the field of medicine. It is simply that, in effect, learned men have said to him: "We trust your good judgment now. As you continue to learn, you now have the responsibility of making your own decisions."

Similarly, a new aviator is not an old pro because he may wear wings as of the date of his designation. He has merely reached a point where his decision can be trusted.

A professional cannot expect to remain on the path of good judgment for long by avoiding decisions. They must be made. An error of deliberate omission is not only cowardly, but can easily be as fatal as one of commission.

Because an error in judgment which may have been embarrassing in 1927 or even 1947 can be fatal in 1975, an aviator must also have courage. Flying under a bridge is not courage. It is foolishness. Nor is it courageous to attempt a forced landing with a damaged aircraft when the odds are stacked heavily against success. To succeed would be no more than luck. Courage is faith in one's own abilities and convictions, and the confidence to act positively upon them - positively and quickly.

A professional can never relax from his conscience when making decisions. His conscience, his training and all the elements that tend to keep him on the path of good judgment are held at their peaks of efficiency. The stimulus to go again when the right decision - as it seemed - failed, is backed by the man's own conscience. He must be able to say to himself that under the same conditions and having the same information available, the decision would still be the same.

Because the aircraft of the future will not be any slower or any less mechanically complicated, the professional aviator cannot afford to have a conscience that is satisfied with decisions which only require him to remain in the shadowy or hazy portion of the path. He must be clearly within its narrow boundaries. As a professional, he must continue to study and train. And he must realize that for him, the path of good judgment is not only narrow, it is continuously narrowing.

A CALCULATED RISK

The safety and success of any aircraft operation today is largely dependent on the accuracy of a myriad of calculations performed by the aircrew in the Flight Planning stage and during the operation itself. The fact has long been recognized in the provision of manual computers designed to solve the complex factors involved in calculating drift, fuel consumption, range, aircraft performance, weight & balance - ad infinitum. These computers, although fine in their way, require a certain

amount of manual dexterity to operate, are sometimes prone to mis-reading (especially by trip-wearied eyes) and generally smack of the horse and buggy era when stacked up against the electronic wizardry and artful smoothness of the commercially available electronic calculator. Nowadays, almost any department store will sell you, at a very reasonable cost, a light weight, portable Einstein which, if fed the correct information

cont'd on page 16

Capt J.H. Cardinal



Sgt J.J. Rodrigue



CAPT J.H. CARDINAL

On the 23rd of May '74, a civilian aircraft was reported missing between Caraqueet and Quebec City. Search and Rescue proceedings were initiated, but for the next four days, the search did not reveal anything due to bad weather conditions.

On the 5th day, a request was made to combat group to organize a ground search party, to investigate a mountainous area covered by clouds. 430e ETAH was in charge of airlifting the search party.

Capt Cardinal, with two observers on board, proceeded to recce a landing zone in the area. Once his task was completed, Capt Cardinal remained in the area in his CH-136 to help controlling the ground search operation, and to assist in the search for the wreckage. As soon as the clouds burned off, Capt Cardinal quickly recce the mountain peaks in the area and was successful in finding the downed aircraft. He then directed the other aircraft to the area, and at the same time dropped off one of the observers in a small clearing so that he could proceed directly to the crash site. Shortly afterwards a survivor was located, who was subsequently hoisted out by another helicopter and airlifted to the hospital.

There is no doubt that through his personal efforts and dedication to duty Capt Cardinal contributed materially to the success of this search.

CAPT. P. RIESCHI

While involved in Air Cadet familiarization flying, the single engine Otter was manoeuvring five to eight miles to the north of Canadian Forces Base Bagotville. Captain Rieschi entered a sixty degree banked turn to the left for one hundred and eighty degrees. When attempting to roll out of the turn, the control yoke jammed and the ailerons were immovable. The pilot declared a "Mayday" to Bagotville tower and proceeded to the field for an emergency landing. Captain Rieschi, Flight Safety Officer for 400 Squadron, manoeuvred the Otter solely by the use of rudder and elevator and landed straight-in with a relatively calm wind. The landing was without further incident. The cause of the ailerons jamming was found to be an upholstery screw which had lodged itself in an aileron control spool. Capt. Rieschi was faced with an awkward situation and his outstanding airmanship and flying skill averted a disaster.

SGT J.J. RODRIGUE

Sgt Rodrigue was the senior supervisor of the maintenance group during 430e ETAH Arctic deployment to Baffin Island, NWT. During the initial phase of the deployment, at Frobisher Bay, the helicopters were being re-assembled after having been airlifted from

Valcartier. Working conditions were not good: the lighting was bad, the facility damp and cool. Because of the urgency to get the operation underway, the pressure was on to get the aircraft serviceable as soon as possible, and as a result the workday for the technicians was particularly long.

On the fourth consecutive day of this tense schedule, Sgt Rodrigue, while inspecting a reassembled CH-135 Huey, discovered some blade damage that could have gone unnoticed for a long time: a tear in a hard-to-see butt cover, that in the local environment, would certainly have led to corrosion with subsequent serious implications to flight safety.

Sgt Rodrigue's action provides a concrete example of professionalism at its best.

CPL G. GRAHAM

During a periodic inspection of a CC137 Boeing aircraft, Cpl Graham was assigned the job of changing an engine nose cowl which had just undergone local modification. While installing the assembly, he heard an unusual sound and proceeded to find the cause. Informed that foreign objects, such as metal shavings, once trapped inside the cowl channel could not come out, Cpl Graham decided to investigate further. His examination revealed a mass of drilled out rivets and anchor nuts in the forward channel and further revealed that holes for anti-icing purposes led directly from this channel into the direction of the engine inlet.

The initiative and professionalism displayed by Cpl Graham in following up an unsafe condition, revealed another possible source of F.O.D., thereby preventing extensive engine damage and a possible in-flight emergency.

CPL R.A. DOUGLAS

While carrying out a daily inspection on a CF104 aircraft Cpl Douglas noted that a high lock wing fastener button had split. The wing, a new modified type, had recently been replaced by overhaul contractor. Detection of this condition was very difficult in that it was a rainy dark night. On the same night in question Cpl Douglas had discovered two other equally difficult problems.

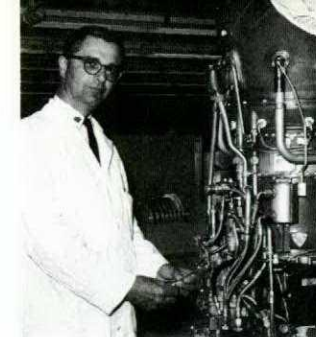
In view of the weather conditions and his relative inexperience on the CF104, Cpl Douglas is commended for his thoroughness in carrying out an inspection in far greater depth than is called for in the CFTO, and discovering a fault that could have developed into a serious in-flight hazard.



Cpl G. Graham



Cpl R.A. Douglas



Sgt F.M. Colucci



Cpl J.F.A. Beauregard



MCpl D.E. Rozee



Cpl J.W. Jackson

MCPL D.E. ROZEE

After considerable discussion with Aero Engine Technicians as to the cause of the engine fire on Argus 10734, MCpl Rozee decided to carry out a more extensive "A" check than normally required on the wing area to the rear of the failed engine. Upon cleaning the under-side of the port wing, he discovered a possible crack in the wing skin approximately six inches inboard of No. 1 fuel dripstick. The skin crack was not readily visible through the paint but subsequent removal of the paint from the area and Non Destructive Testing, revealed the crack to be 3 3/16 inches long.

Follow up action led to a Special Inspection being carried out on the Argus Fleet. The SI revealed a crack on the starboard wing of the same aircraft and on four other Argus aircraft.

The genuine concern expressed by MCpl Rozee in the first instance and the outstanding professional manner in which he performed his work led to the early detection of the stress cracks and probably prevented a possible serious air incident and/or costly and complicated repair schemes to the wing surfaces.

CPL J.W. JACKSON

"Although safety systems inspections are not required on "A" or "B" checks on Buffalo aircraft, Cpl Jackson decided to check the safety equipment aboard the search and rescue standby Buffalo after it had completed a training flight. Cpl Jackson detected a leak in the passenger oxygen system which is vital on air evacuations. He then removed the oxygen control panel and discovered a broken oxygen line.

"The line was removed, a new one manufactured, and installed. The aircraft was immediately launched to air evacuate a heart attack victim from Charlottetown to Halifax.

"Cpl Jackson performed a duty beyond his sphere of responsibility and through his initiative he averted a possible hazardous in-flight situation as well as contributing to the safe airlift of the patient."

SGT F.M. COLUCCI

Sgt F.M. Colucci is a Quality Assurance Representative at a civilian contractor repair and overhaul facility. Not normally engaged in inspection and surveillance of Aircraft Turbine Engines, Sgt Colucci while filling in for the regular Q.A. Representative in the Engine Overhaul Department noted that a T58 engine on dismantling, had failed internally. Investigating further, he noted that the oil pump was missing and was recorded as "removed to service another aircraft".

Realizing that the removed oil pump would be in a contaminated condition, he immediately alerted the user unit of a possible failure of an engine in service. Further investigation and action at the unit resulted in the engine on which the oil pump had been installed being removed from the aircraft and returned for repair due to contamination.

Sgt Colucci's prompt action and conscientious approach in a new and unfamiliar area of duty may have averted a serious accident.

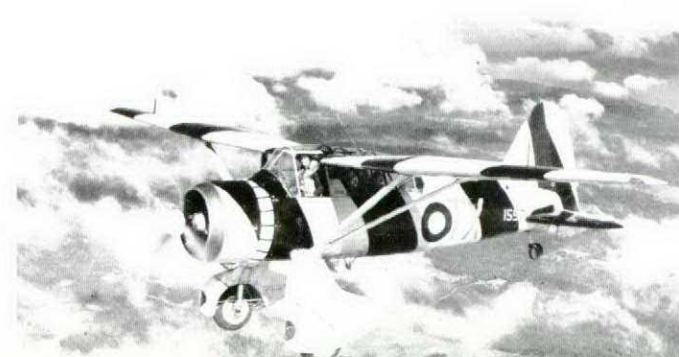
CPL J.F.A. BEAUREGARD

Cpl Beauregard, an Instrument Electrical Technician, employed in the Aircraft Sampling and Production Branch at the Aircraft Maintenance Development Unit, recently discovered a potentially dangerous situation on a CF104 aircraft. While carrying out a pre-power check of the aircraft electrical wiring prior to attempting post modification functional checks, he noticed that the routing of the left main wheel hydraulic line was not in its normal configuration. Although not required by the task at hand, and not associated with his trade, he carried out a closer inspection of the brake line. His inspection revealed that a portion of the line was chafed, with both the outer and metallic braiding protective coverings worn completely through, and the inner hose partly worn. He immediately brought his findings to the attention of the senior Airframe Technician and appropriate corrective action was taken. Rupture of this line when the aircraft brakes were applied could have caused a very serious incident or accident.

Although it is highly unlikely that the Airframe Technicians would have missed the chafed line on the next aircraft inspection prior to flight, the hazard still existed and Cpl Beauregard showed praiseworthy professionalism as an aircraft maintainer in detecting and eliminating the hazard.



VENERABLE A O P's



ENGINE TREND MONITORING

by Capt D. Matthews DAES

This article is for all of you who want to be inflation-fighters and who want to save money in our era of rising costs. No, it's not a short course on mutual funds or on buying land in Labrador as a hedge against inflation. It's about a simple tool called Engine Trend Monitoring - ETM for short - and it tells how ETM can beat back rising fuel and maintenance costs better than any propaganda campaign while your squadron still carries out normal operations.

What is TEM? For those of you who maintain or fly the Twin Huey, Twin Otter or Boeing 707 aircraft, you already have a good idea. The rest of you are no doubt baffled. Well, it's really quite simple. Every a/c engine we use - and for the purpose of this article we shall restrict ourselves to gas turbine engines - comes to us with a complete set of specifications and performance curves which reflect the minimum performance considered acceptable for the engine. These generally

take the form of graphs or charts which define the values we can expect from certain engine parameters such as exhaust gas temperature, speed, fuel flow, torque, or thrust while the engine is operated at different altitudes and outside air temperatures. If an engine is stabilized at a given power setting under known ambient conditions and instrument readings are taken of certain of its parameters and then compared with their specification values for those conditions, there will undoubtedly be some numerical difference. When a chart is plotted of the value of these differences over a period of time, we are practising Engine Trend Monitoring. Such a chart is illustrated in Figure 1. Most squadrons now utilizing ETM generally take one set of data for each aircraft each day. The trend chart is then closely examined over a relatively long period of time to determine if deviations of the parameters are occurring, thereby indicating to maintenance personnel

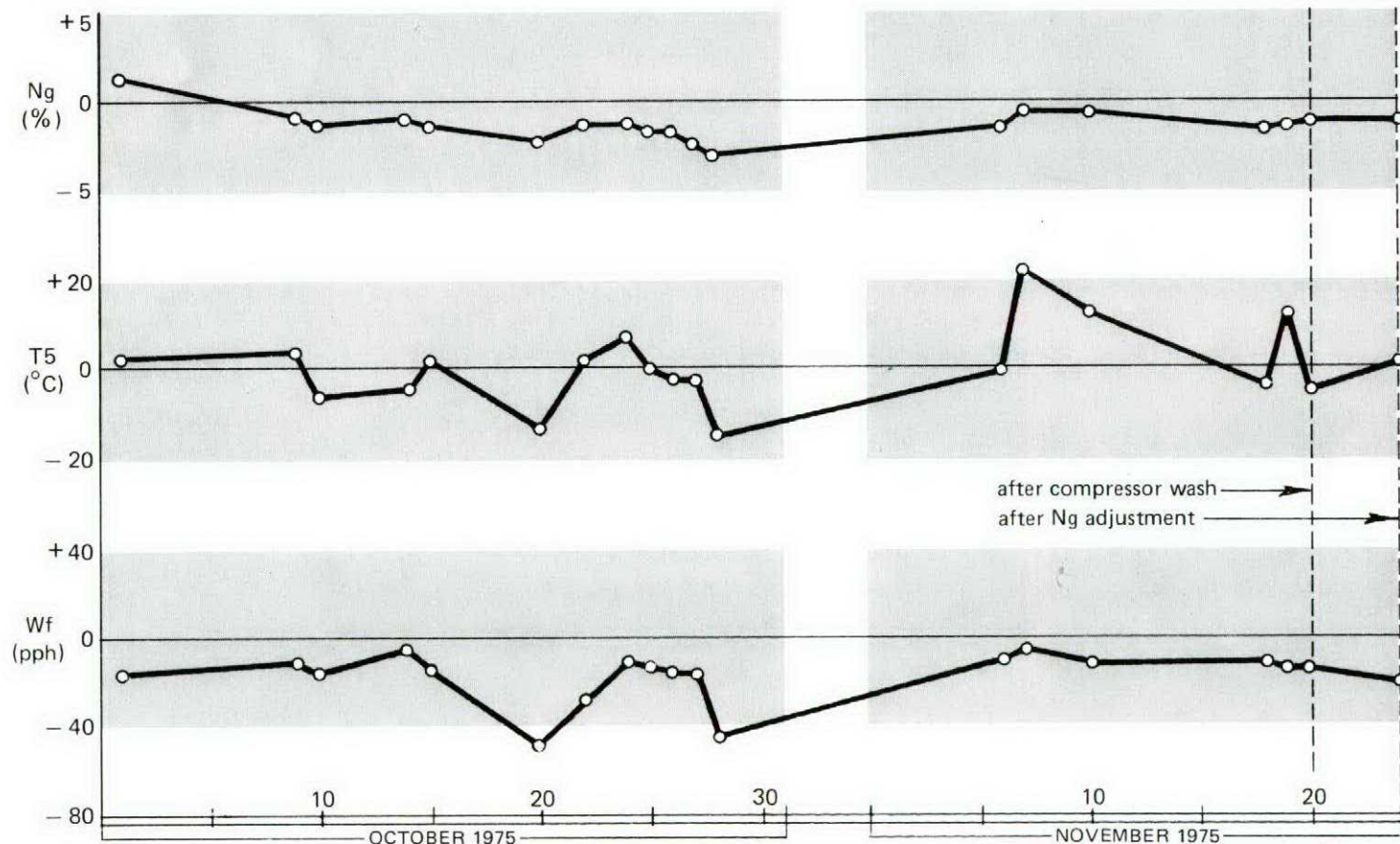


Figure 1 - TYPICAL TREND CHART FOR T400-CP-400 ENGINE

This chart illustrates how a trend chart may be used. The general trends over a two-month period for Ng and Wf show very little change and stay below the maximum acceptable value (the zero line); however, T5 exhibits very erratic data points and, in fact, has many points above the accepted maximum. In an attempt to correct the T5 trend the squadron tried a compressor wash and Ng governor adjustment but failed to clear the problem because T5 was still over the zero line on 24 Nov. The problem was finally traced to a shorted T5 electrical lead. This could have potentially caused incorrect engine temperature readings and possible eventual engine overtemping.

that some maintenance action is required.

One of the more successful Canadian Forces ETM programmes has now been in use for just over a year on the T400-CP-400 engine in the CH135 or Twin Huey helicopter. For this turboshaft engine, Pratt and Whitney Aircraft of Canada, the manufacturer, has supplied a series of charts (engine specification values) which detail maximum allowable readings of inter-turbine temperature (T5), fuel flow (Wf) and gas generator speed (Ng) for given torque settings over a range of pressure altitudes from -500 to +5000 feet and a range of ambient temperatures from -50°C to +50°C. To



"... trend monitoring provides more productive time."

obtain a single data point, the pilot simply trims his engine to the torque called up in the chart for the ambient altitude and temperature and then reads T5, Ng and Wf. These values are then compared with what they should be (the chart value) and the differences plotted by the maintenance section as in Figure 1. Through experience, maintenance personnel soon learn to trust the engine trend charts and to apply certain rectification procedures for the type of slope or trends they see occurring. For example, on the T400 engine, a dirty compressor typically manifests itself as a gradual rise in Ng, T5, and Wf, a faulty bleed valve as abnormally high or low T5 readings, and hot section distress as a gradual increase in T5 and Wf and a decrease in Ng.

Now we come to that part you've all been waiting for - what good is all this and how does it save money? Table 1, detailing the function of ETM, should answer the first question. Suffice it to say that ETM will not prevent deterioration of a system or one of its components but it will indicate when a part has deteriorated beyond limits and needs to be replaced, thereby preventing the secondary damage which could have resulted should the part not have been replaced. Table 2 outlines some of the currently detectable problems. This is really where ETM shines because some of these problems, though small, are usually the most costly to our operations. In fact, we have done a study in DAES of the effect of using ETM on the CH135 for the past year. The changes in Ng, T5 and Wf have been calculated and averaged for the whole aircraft fleet based on all the maintenance actions taken from the ETM trend charts. The results indicate an average drop in

TABLE 1
FUNCTION OF ENGINE TREND MONITORING

- DIAGNOSIS OF MECHANICAL MALFUNCTIONS
- WARN OF IMPENDING FAILURE
- ELIMINATE UNNECESSARY INSPECTIONS
- ELIMINATE UNNECESSARY PART REMOVAL
- BASIS FOR ON-CONDITION PARTS REPLACEMENT
- MINIMIZE SPARE PARTS INVENTORY
- REDUCE LIFE CYCLE ENGINE OWNERSHIP COSTS
- INCREASE AIRCRAFT AVAILABILITY
- IMPROVE AIRCRAFT SAFETY
- INCREASE PROBABILITY FOR MISSION SUCCESS
- EXTEND TIME BETWEEN OVERHAUL
- RECORD-KEEPING ABILITY
- HELP FAULT ISOLATION
- ENSURE ADEQUATE PERFORMANCE MARGINS
- INCREASE AIRCREW CONFIDENCE IN PERFORMANCE AVAILABLE

TABLE 2
PROBLEMS CURRENTLY DETECTABLE BY ETM

- DIRTY COMPRESSOR
- Ng FRICTION PROBLEMS
- IGNITION PROBLEMS
- HOT SECTION DISTRESS
- FAULTY THERMOCOUPLES
- WORN T5 HARNESS
- FUEL PRESSURE HIGH
- FOREIGN OBJECT DAMAGE
- BLEED CONTROL DEFICIENT
- INCORRECT COMPRESSOR TURBINE VANE CLASS
- INCORRECT POWER TURBINE VANE CLASS
- BLOCKAGE OF AIR INLET
- INCORRECT TURBINE BLADE TIP CLEARANCE
- NOZZLE AREA TOO HIGH OR TOO LOW
- PERFORMANCE PARAMETERS OUT OF LIMITS

Ng of 225 rpm, an average drop in T5 of 16.03°C and an average drop in Wf of 7.74 pounds per hour per engine (two power sections). Converting these figures into dollars means a potential annual saving of over \$300,000 in overhaul and hot section inspection costs and an annual saving in fuel costs of over \$7000. The overhaul savings are based on Pratt and Whitney's estimate of operating the engine 16°C cooler and the fuel savings are based on operating the engine with a 7.74 pph lower fuel flow. When the labour and personnel costs of operating the system are considered, the net annual saving translates into about \$292,000 as a result of ETM or close to \$3,000,000 over a ten-year period. Of course, not only are there monetary benefits but also the more intangible benefits of Table 1, such as a considerable reduction in the base maintenance workload. Such actions as hot section inspections or pulling an engine for overhaul due to time limits being reached are now not required as frequently if ETM is practised religiously.

Aha, you say, this is the sort of thing all those "bean

counters" in headquarters must really love. Well, there's more to come. Believe it or not, ETM only scratches the surface of what *could* be done. Many airlines — and also many other military services — are either using or developing totally automated systems which not only include the basic parameters of ETM but also measure literally dozens of other engine variables. These are truly complete engine health monitoring (EHM) systems and are used as a basis for on-condition maintenance of the engines. In other words, no maintenance or inspection is done until the condition of the engine dictates a requirement. Some of these more sophisticated systems even have on-board computers which have an instantaneous print-out available to aircrew or which indicate to maintenance personnel any fault in the engine by means of indicator lights examinable on an aircraft's return to base.

We, in the Canadian Forces, are not in the enviable position of having unlimited funds to commit to the development of such equipment. However, we are pursuing projects in some of the less impressive aspects of engine health monitoring. ETM is, of course, the most important, as detailed in this article. Others which may or may not be familiar to you are SOAP, overtemperature recorders, engine usage indicators, vibration monitoring, borescope inspections and a prototype fully automated system called ATREDS (Automated Engine Trend Recording and Data Reduction System).

ATREDS is intended for use on the Boeing 707 and Hercules aircraft and basically fully automates a similar

trending system to that described for the T400-CP-400 engine by means of an onboard cassette tape recorder and processing unit and a ground-based computer. Watch for it. It should be a money-saver, too!

Now that you have seen how a simple system can save money and time on one aircraft type, consider what it could do on *all* our aircraft. Consider multiplying that \$3,000,000 figure for even the five different helicopter engine types we operate and you will see that with a little effort it really is possible to save money without restricting our operations. If extended to our turbojet and turboprop engines the sums are very impressive indeed. We hope we've raised some interest in ETM with those of you unfamiliar with it. For all those squadrons using it but not knowing why, here is your answer. Keep up the dedication. It really pays off.

ABOUT THE AUTHOR Capt Matthews is a graduate of the Royal Military College where he obtained B. Eng and M. Eng degrees in mechanical engineering, specializing in turbomachinery and cryogenics. He is presently employed as a propulsion systems engineer in the Directorate of Aeronautical Engineering and Simulators at NDHQ.



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and parameters, will instantaneously solve most operational problems with an accuracy unattainable by other methods.

This being the case, it stands to reason that all crewmembers possessing one of these invaluable aids should be encouraged to bring it aboard the aircraft and bring the operation into the space age. Right? Right-up to a point, but regrettably there is a joker in the deck. An electronic calculator, like many other electronic devices, is a miniature transmitting station and radiates signals which can affect aircraft electronic systems if switched on in the vicinity of an antenna, unshielded leads, terminals, or equipment racks. Please note the term 'switched on' instead of 'operated'; it is not necessary to punch buttons to make it transmit; it does so continuously whenever power is applied to its circuitry.

FAA, MOT and DND have done exhaustive tests on a number of these calculators and have found that few aircraft electronic systems are immune to the possibility of interference. In a recent test performed on a CAF Buffalo, no fewer than fifty eight interference problems were encountered involving nine systems including:

- a. Auto pilot — 26 cases
- b. ADF — 17 cases
- c. VOR — 6 cases
- d. LORAN — 3 cases
- e. HF — 2 cases
- f. Radar Altimeter — 1 case
- g. VHF — 1 case

- h. Weather Radar — 1 case
- j. Navigation Radar — 1 case

One of the big dangers in the airborne use of hand held electronic calculators is the unpredictability of their effect. The strength of signal varies enormously depending on the model and on its state of repair or disrepair. Also it's very portability allows it to influence different systems as the operator moves about the aircraft.

Finally, it must be realized that the calculator itself is subject to interference. If the calculator is operated in an area subject to transient interference, it could suddenly become a babbling idiot with the mathematical competence of a two year old orang outing; hardly the best assistant when you're concerned about your fuel consumption or C. of G. computations.

So, if you **MUST** use an electronic calculator on board an aircraft, abide by the provisions of CFP100(3) Art 415 and remember these things:

- 1) It is only to be used with the knowledge and the expressed permission of the Aircraft Commander;
- 2) Do not use it in the vicinity of antennae, unshielded leads, terminals or equipment racks;
- 3) Be suspicious of answers, and always double check if accuracy is critical;
- 4) NEVER use it while an instrument approach is in progress; and
- 5) When it's not in use — **TURN IT OFF!**

Experience is only valuable if you use it... *Anonymous*

1968. The trip from Gimli to Downsview was planned and the T-33 was on the line. The weather was clear all the way and the gods had smiled and given me a 170 knot tailwind. The favourable weather and the thought of a Toronto weekend put me in a happy frame of mind. My student was ecstatic. He had not seen his girl in Toronto for some time. My mood was not so light when I saw the left main tire.

CURSES — many of them, in fact. The tire was well worn, obviously to limits. The Sergeant was waiting for me when I walked into the hangar to voice my observation and objection. He explained that the tire was serviceable and the only reason that they had let it go longer than "normal" was that there was a tire shortage. The groundcrew normally changed tires before they were turly worn to limits as they took quite a bit of punishment during the training of the students. Perhaps my standards were too high having enjoyed the care taken by the groundcrew. The Sergeant gave me an excellent briefing on tires using a cut away section as a training aid. A worm of doubt remained but the Sergeant was a conscientious individual, respected by the pilots for his fine efforts in maintaining our fleet. And so he should have been. We accepted the bird and took off.

The trip to Toronto was uneventful. Unfortunately, so was the weekend. We departed Toronto planning to refuel in Thunder Bay. The gods no longer smiled as the favourable wind on the trip down was as unfavourably strong for the trip back; the weather at Gimli and Winnipeg was poor. We would have a heavy landing weight (but within limits) at Thunder Bay, yet we could not make Gimli with the required alternate fuel.

The touchdown at Thunder Bay was smooth but the tire blew just the same. It was a tricky little devil to keep straight. Especially when the crosswind was also pushing the same way as the flat tire was pulling. I was not doing too well in trying to keep it on the runway. Fortunately, just as I was about to go off the side, our runway crossed another. A touch of brake on the left, or blown wheel and we turned off on the other runway and came to a stop. Amid smoke from the left tire, and the noise of arriving fire trucks, I calmly climbed out of the cockpit, forgetting to install my seat pin in the process.

1970. Yeovilton, England, is a Royal Naval Air Station where transient maintenance is totally manned by women (or it is personned by women). They did a good job of turning

around my T-33 and then it was time to return to Baden-Soellingen. The Sergeant, who was the best argument against the military rules of non-fraternization that I ever saw, explained that the start unit would not be available for an hour. Would I do a battery start as other visiting Canadians did? At the time I considered whether the fact that a woman made the request influenced my decision and I'd like to believe that it did not. I had done a number of battery starts before; we were filed and late.

I started the T-33 and thankfully the start lite went out at the end of the cycle. No broken quill shaft. But as I left the line, I wondered if there was an extra quill shaft in the tip pin storage area — and if the Sergeant would have helped me change it had it been necessary.

1974. The utility hydraulics had failed while on a CF101 intercept training mission. As this meant the loss of normal brakes, I told my navigator that I would lower the hook as soon as we were down so it would be set for a barrier engagement should the emergency brake system fail to stop us before the barrier. An experienced type, the navigator said that we did not need the hook as this was a "no sweat" situation. So I landed, and became very busy stopping the Voodoo. We stopped 500 feet from the barrier with the hook up.

During the last 500 ft of the landing roll, the right main tire passed over a solitary, dinner-plate size patch of ice. With no anti-skid, the wheel locked and wore away 18 of the 19 plys of the tire. It was so flat that they could not tow it to the line. Had it blown, would I have travelled further? And would I have gotten the hook down in time to engage the barrier?

I consider myself to be an average pilot in the Armed Forces. I pride myself on being proficient and conscientious. Yet, in the above instances, I was not the professional that I ought to be, for I ignored my experience as a pilot. In all cases, the worm or wisdom, if you will, was in my mind after I heard their arguments. I allowed my experience to be pushed aside out of respect for their judgment and experience. And in realizing this, my experience has grown.

Obviously, we must trust others training and competence in various fields. But as aircrew, we must weigh our own experience and not thoughtlessly cast it aside. To do so is to reduce the most qualified individual to a level of the inexperienced. Experience is only valuable if you use it.

OBSERVED IN INCIDENT REPORT

(from the investigators)

"PRECIPITOUS ACTION"

A recent commercial helicopter accident points out the requirement for air crews to use all available cues when deciding upon a course of action in an emergency situation.

The pilot was flying at an altitude of 700 feet and was a mile and a half from his destination when he received a cockpit indication of engine fire. Although there was no other indication of a fire and all systems operated normally, he shut the engine down, activated the fire bottle and made an autorotative landing in the water. Passengers and pilot were rescued by a boat from an oil rig.

The aircraft sustained only minor damage during the water landing, but was substantially damaged during salvage operations.

This was another instance of a fire warning system which had malfunctioned, and which indirectly was the "cause" of an accident instead of a preventer. An upcoming "Flight Comment" article will point out that catastrophic fires are uncommon to say the least and are almost guaranteed to exhibit visible cues other than just the "peek and panic" light. Waiting 30 seconds won't hurt and may really help.

"TAIL ROTORS — DON'T MESS WITH THEM"

The ever present danger of having persons walk into helicopter tail rotors was aptly pointed out in a recent fatal commercial accident.

The pilot landed to disembark his passengers without shutting down. The crewman was in the process of letting passengers out from the right side of the aircraft when another passenger got out and walked into the tail rotor.

Pilot's precautionary procedures must assume the worst — no matter how often their passengers have travelled by helicopter. Brief and supervise every time.

Unless operational considerations require deplaning passengers without shutting down, it is probably worthwhile to consider making this a standard operating procedure, particularly in helicopters where the main rotor represents an additional hazard.

CH147 WAKE TURBULENCE

A CH-147 helicopter operating at 30,000 lbs all-up weight had just completed transition from a hover to forward flight after being cleared for take-off on runway 14. The tower had also cleared an executive jet to land on runway 14 with only thirty seconds interval behind the departing helicopter but had not cautioned the pilot of the possibility of wake turbulence. While on short final the jet aircraft went into a sudden and uncontrolled 70 degree right bank from which the pilot was barely able to recover and overshoot with a subsequent safe landing. It is almost certain that the uncontrolled situation was caused by rotor wake turbulence from the CH-147 helicopter. At the time this occurrence took place there was a thirty degree crosswind at 10 KTS.

Although this occurrence involved a civilian aircraft, it is a clear reminder to CF pilots of dangers of wake turbulence.

Aircraft Type: — Tutor

Occurrence: — (1) F.O.D. in refuelling operation
 (2) F.O.D. removal technique

Narrative: — (1) While refuelling the aircraft an unlit cigarette was dropped from the ear of the refueller into the tank

— (2) The pilot, using a broomstick and a straightened fish hook managed to spear the cigarette and remove it from the tank.

Moral: — (1) Refuellers should avoid storing articles in their ears or on or about their persons which might fall into the fuel

(2) Pilots should always carry broomsticks and fish hooks

— (3) Fish hooks should be relatively dull and hence capable of puncturing soggy cigarettes but not aircraft fuel cells.

— (4) The surgeon general is right about cigarettes being a hazard. N'est-ce pas?



Aircraft Type: — T-33

Occurrence: — Flameout on Landing Rollout

Narrative: — Passenger was not briefed on the importance and position of the high pressure cock but was told not to touch anything unless he knew what it was. In an attempt to loosen his shoulder harness which can sometimes require moving the harness lock lever back and forth, he moved the high pressure lock back and forth. This caused a reduction in fuel flow sufficient to flame out the engine.

MORAL: Anything which can be done wrong will be done wrong eventually. Pilots are reminded of the importance of thorough passenger briefings.

THE DEVIL AT SIX O'CLOCK UPDATE



Capt J.D. Williams

How many friends have you lost since you started military flying? If you've been at it for ten years I'll bet that ten or more guys you knew quite well have dug themselves smoking black holes in the ground, and if I'm wrong it's probably because my estimate was on the low side.

How many of those friends were shot down by enemy aircraft or by anti-aircraft fire? How many died in action in a combat theatre? Within our own forces the answer is obvious — none — yet they did nonetheless. Nothing is going to bring them back, and the aluminum they rode in is good now only for pots and pans — if it was left in big enough pieces to justify picking up and melting down.

Let me cite just a few examples of what I'm talking about and see if maybe they don't ring a bell.

An aircraft took off for a weekend jolly. Less than an hour later it was scrap aluminum in a farmer's field, two pilots were dead, and a lot of questions led to the not very satisfactory conclusion that the pressonitis had claimed two more victims.

A T-Bird took off to have its picture taken. An unplanned loop with a ton or more of unthought-of fuel on board made the recovery a little low — a foot or so low, it seemed to those of us who were watching — not much, but more than enough to kill the driver.

A Voodoo driver impressed some icefishermen and probably himself and his navigator also. They died after hitting the lake on which the fisherman had their huts.

At least two drivers tried 180° turns after power loss at low level in an attempt to reach a runway. Neither made it. Instructors since time immemorial have preached against this graveyard turn.

A young instructor drove into the ground on a low level nav trip, after much more experienced flyers had either punched up or turned around. Would you believe he hit a railroad embankment?

If I sound bitter it's because all of the guys mentioned were friends of mine, and there are more I could name.

As a matter of fact I think it might be worthwhile to drive the point home by listing a few more.

A tactical fighter pilot was proceeding along a planned route when "bounced" by one of his buddies. While looking over his shoulder apparently attempting to check six, he flew into the ground at high speed with predictably fatal results.

A Dak search and rescue crew having found their "rescuee", circled tightly over his position — so tightly in fact that they stalled, crashed and burned. We know this because the



"rescuee" was a competent and living witness. The Dak crew was dead.

A Tracker put on an impromptu airshow for an interested freighter crew. The finale? You guessed it, a stall/spin into the water which left no survivors to tell us why.

A 104 impacted on the range after a rocket firing pass. It is possible that the pilot delayed his pullout to watch for the hit, or that he misjudged his altitude. Whatever, he won't do it again.

Another 104 crashed into the sea after what appears to have been a final turn pitchup. There was no way for this pilot to recover the aircraft, but it is probable that if he had accepted this fact more quickly he could have ejected safely.

Two T-Bird drivers took off to aid in trials of an air defence missile system, and hit a snow covered lake in whiteout conditions. In simulating a tactical fighter operation they took risks which no tactical fighter driver would think of taking operationally, and they paid with their lives.

A Starfighter ran into a hill on a low level radar route. The pilot was known to be an expert navigator but he apparently tried to remain in VMC when he should have flown his preplanned altitude.

A T-Bird crashed a short distance from a civilian airfield after failing to complete the second of two low level rolls. Maybe the 500 gallons of fuel on board messed things up, or the fact that the weather was IFR, or the fact that the pilot

cont'd on page 23



Thirty-five years ago, in June 1940, the military situation in Europe was deteriorating rapidly for the Allies. The assault on France begun on May 10 had succeeded beyond Germany's wildest dreams. French forces were rolling back behind their Maginot Line and the evacuation of the French Army units and the British Expeditionary Force at Dunkirk had started on May 26.

Monday June 3 was a particularly bad day. Not only was the British evacuation completed, leaving 40,000 prisoners and France cut off from her allies at the mercy of the Wehrmacht, but the Luftwaffe turned from the Dunkirk beaches to Paris, killing 50 and injuring 150.

No doubt the raid was designed as much to destroy the already low morale of the French population as to achieve any military end, for the German Generals were eager to realize Hitler's goal of an Armistice by June 15.

At Lanyec-Poulmic airport, however, the personnel of

The Saga of the "JULES VERNE"

by Robert Rickerd

Escadrille Aéronavale B5 were not demoralized. Their mood matched that of thousands of other Parisians and Frenchmen everywhere who were shocked and infuriated at the attack on their beloved and defenceless city, and they were demanding revenge beyond the mere 26 German aircraft shot down during the raid.

Revenge, ideally, would be a reply in kind to the German capital. But France was unable to mount an effective aerial defence against Germany's Blitzkrieg let alone launch an offensive strike against Berlin. Moreover, the *Armée de l'Air* had been caught in the process of re-equipping its units with new modern aircraft when war broke. It still depended on an earlier generation of obsolete medium-range, poorly-armed bombers. Only *Aéronavale B5* possessed a plane and a crew which could even attempt such a mission.

When it had been obvious that war clouds were gathering in Europe it was realized that long-range aircraft would be needed to patrol France's long coastline and protect her vital sea lanes from German U-Boats. To this end, it was decided that their three examples of a four-motor transatlantic mailplane which had been designed for Air France should be converted for service as a maritime reconnaissance bomber. The aircraft, with a maximum speed of only 310 km/hr and a long range cruise speed of 220 km/hr were built by the famous Maurice Farman works. They were named "Camille Flammarion", "Jules Verne" and "Le Verrier" in the Gallic tradition and were refitted and assigned to the aforementioned *Escadrille Aéronavale B5*. The "Jules Verne" was the first to enter service and soon earned a place in history with a daring flight—an adventure which would have done justice to the pen of its namesake.

With the German advance in high gear, strategic bombers were urgently needed, so the "Jules Verne" was painted black and *Aéronavale B5* was assigned to night bombing operations over the front rather than to the maritime reconnaissance role at first envisaged. It participated in attacks on Aix-la-Chapelle, Ostend, Walcheren, Flessingue, and Saint Omer in France, Germany and Holland during May.

By the time *Aéronavale B5*'s preparations to avenge the attack on Paris were completed on the 7th of June, the military situation was critical for France. The "Jules Verne" was flown to Mérignac aerodrome near Bordeaux on the Bay of Biscay to take advantage of the longer runways there and to be out of reach of Goering's Stukas, which by now ranged freely behind the front.

Capitaine de Corvette Daillière and his crew, fresh from extra rest, took off at 1530 hours with a full load of fuel, 30 incendiary and eight 220 kg bombs, each suitably dedicated to the enemy.

Henri Daillière, at 39, was a veteran of long-distance flying. He had made a record-breaking flight of 4338 km in 1935 with Lieutenant de Vaisseau Hébrard in a Latécoère seaplane. The rest of his crew, Yonnet the pilot, Comet the navigator, Corneillet the flight engineer, Deschamps the bombardier and Scour the gunner—had all been hand-picked from the French civilian and military roster.

For the navigator Comet, the raid was a challenge. The "Jules Verne" was armed with only one small-bore machine gun, of little value to crew morale or to defence. It was therefore necessary to stay as far away from German fighter bases as possible. This in turn meant that much of the flight had to be made over open water with no landmarks and no radio contact to check course. The return flight would be over blacked-out and unfamiliar Germany. Comet navigated the "Jules Verne" north over Caen to the English Channel, north-east past the tip of England near Dover to the North Sea, skirted Belgium and Holland, then flew east over Denmark to the Baltic and finally south to Berlin—a direction from which the Germans scarcely expected an attack.

Berlin was ringed by barrage balloons at a height of 1500 m and there was six-tenths cumulus cloud over the target. At midnight the air raid sirens sounded sending a few believers to the shelters. Daillière had Yonnet criss-cross the area four times with desynchronized motors to give the impression of more than one aircraft before dropping his bombs on a Siemens factory. The French Press later referred to "Une formation de l'Aéronautique navale" in describing the raid, suggesting that the Gallic air forces had numbers of aircraft which could carry out such bold thrusts.

Comet subsequently directed the "Jules Verne" safely past Leipzig and Frankfurt to France and Yonnet landed safely at Paris' Orly airport at 0500 after over 13 hours in the air.

The flight was successful for a number of reasons—among them the "Jules Verne's" 5000 km range and Germany's lack of night fighter defence at that early stage of the war. But the most important factor was the courage of the men of *Aéronavale B5* who attempted the impossible at a time when France had been virtually driven to her knees and little hope remained.

News of the attack was not allowed to reach the German press. As a matter of fact, Bill Shirer, who was in Berlin at the time, did not even mention it in his "Berlin Diary". But to the Allies the raid burst the balloon of German territorial impregnability loudly proclaimed by Goering less than a year before.

The "Jules Verne" later bombed the Heinkel works at Rostock on the German Baltic and when Italy entered the war it bombed gasoline storage tanks at Porto Marghera near Venice, running out of fuel as it landed safely once again at Mérignac. The last sortie for the big plane before being returned to Air France was an attack on an arsenal at Livorno.

Less than one month later, the RAF began the night bombing of Germany, and attacked Berlin for the first time on August 25—again as a reprisal for the Luftwaffe raid on London the night before. Hitler had sown the wind.

The "Jules Verne" was later destroyed by the French at Marignane to prevent it from falling into German hands and on October 11, 1942, Daillière, who had joined the Vichy French forces at Dakar after the fall of France, was killed during an engagement between his "Martin" reconnaissance plane and a defending British Hurricane from Sierra Leone. ■

SEA KING TIPS



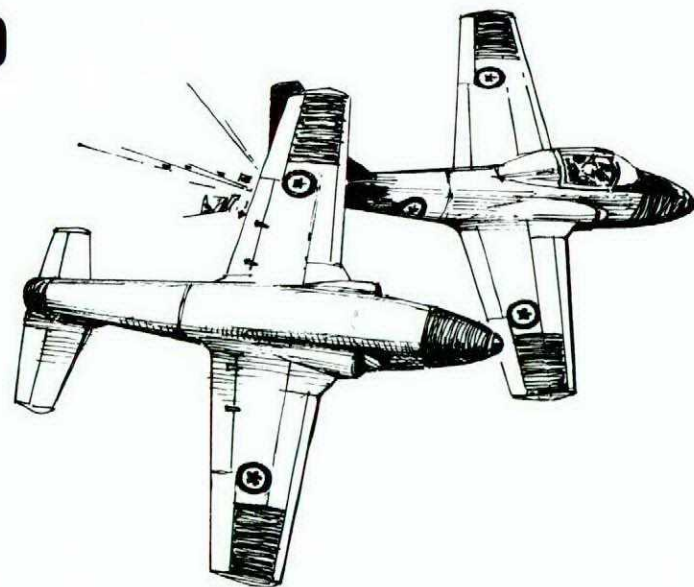
■ The wind speed was 45 to 50 knots with a considerable sea state, consequently the trawler was pitching and corkscrewing up to 20 feet. The aft end of the boat was cleared apart from the standard dinghy and a navigation light pole of some 7 feet on the very stern. The light was fading and the landing lights were being used to illuminate the trawler deck. Three attempts were made to position the winchman onto the back of the trawler to bring up a patient with appendicitis, on a double lift. On the first attempt the winchman experienced a considerable swing and had to be brought back into the aircraft. The second and third attempts had to be aborted due to communication problems between crewman and pilot. On the fourth attempt the winchman was placed on the back of the trawler but while he was placing the patient in the strop a considerable length of wire had to be paid out to overcome the movement of the boat. This wire was seen to become entangled with parts of the boat so the winch operator gave the order to cut the cable. During the crew briefing consideration had been given to this possibility so that the guard has been lifted from the cable cutting switch.

■ A single-engined landing from a rejected take-off was being practised, following a simulated engine failure just before the decision point of 50 feet. The aircraft's attitude at touchdown was not level and during the landing run there was a bang from the rear of the aircraft. Upon examination it was found that the tail oleo had been severely damaged. A heavy landing check was carried out and no further damage was found.

■ While carrying out pre-take-off checks after engine start and with rotor engaged, a loud chattering or hammering noise was heard and felt through the controls, accompanied by violent fluctuations of both hydraulic system pressures. An emergency shut down was carried out. The aircraft swung through 180° despite the application of full wheel braking.

British Airways Air Safety Review

GEN FROM 210



tutors 114074 and 114140 21 May 75

Dragon Tango formation took off from Moose Jaw on 21 May with the intention of carrying out a normal formation training flight. The student in the lead aircraft was carrying a camera and hoped to obtain some inflight photos of the other aircraft. After an appropriate period of functioning as lead, Tango 1 told Tango 2 to take the lead and manoeuvre the formation. When the required manoeuvres were successfully completed Tango 2 (the former lead) asked Tango 1 to fly straight and level while he carried out some photography.

Eventually in an attempt to obtain a plain view of Tango lead, Tango 2 rolled inverted above him. The captain of Tango 2 then apparently became disoriented and while attempting to retain or increase aircraft separation allowed his aircraft to move down and back striking the tail of lead with his right wing. This caused the destruction of enough of leads horizontal stabilizer to cause loss of control. The occupants of the lead aircraft overcame severe negative "G" forces and ejected successfully with minor injuries, a cold dunking in Old Wives Lake, and some exciting memories.

Tango 2 although damaged was able to recover successfully at Moose Jaw with an interesting story to tell and some very expensive photographs.

The investigation of this accident brought to light several interesting points. First it raised the question of who is really responsible for leading a formation — the man who signs out as lead or the man who has "taken the lead" while airborne.

Second, it reaffirmed our opinion that unplanned photo flights can be "a danger" — we formed that opinion last year

when two Trackers merged momentarily under somewhat the same circumstances.

Third, it pointed out some deficiencies in our SAR capability. A very frustrated base rescue flight helicopter driver arrived overhead the two "rescuees" only to find that his aircraft was not capable of effecting a pickup.

So we lost an aircraft, came reasonably close to losing two pilots and learned very little that we didn't already know. We will solve the specific problems which involve policy and equipment and you the operators at the much-vaunted "sharp end" will have once again to address the "people problem". Enough said?

Comments

to the editor

Dear Sir,

The illustration of the spitfire cockpit on the cover of the above issue is superb. The comment on page 24 and the pilots notes to the right of the cockpit declare that a Mark V is depicted. However the aircraft is in fact a Mark IX or possibly a Mark VII or VIII as evidenced by the four blade rotor propeller and the rectangular rear view mirror. This is further supported by the aircraft on final approach to the left of the illustration. Again the four blade prop, six stack exhaust, volkes carburetor filter and two large under-wing coolers.

The four blade prop and six stack exhaust were fitted only on Mark VII, VIII, IX and XVI aircraft which were fitted with Merlin 61, 63 and 66 engines. Mark V aircraft were fitted with Merlin 45 and three blade prop. A search of my records (I'm a spitfire freak) reveals no evidence of a Mark V variant with series 60 engine and thus four blade prop.

This is of course a minor observation in view of the quality of the illustration and is submitted in the

interests of Technical Accuracy. I look forward to further examples of Mr. Beghin's work.

Yours very truly,

I. Farrar

Dear Sir;

Thank you for your letter regarding our July/August cover. You are the second person to spot the technical error, the first being the Director of Flight Safety himself before the magazine went to print. Unfortunately we couldn't alter the drawing so we just left it, realizing that we would inevitably hear about it. It happened that I had some photos with that Spit sitting in the background, and sure enough the prop was three bladed. Jean-Luc just goofed a wee bit on that point. As far as the mirror is concerned, I must assume that it will agree with the evidence of the prop.

Further work by Jean-Luc will appear shortly in the form of another cockpit drawing, possibly CF104 or F-86.

Again thanks for your interest.

Sincerely,
J.D.W.

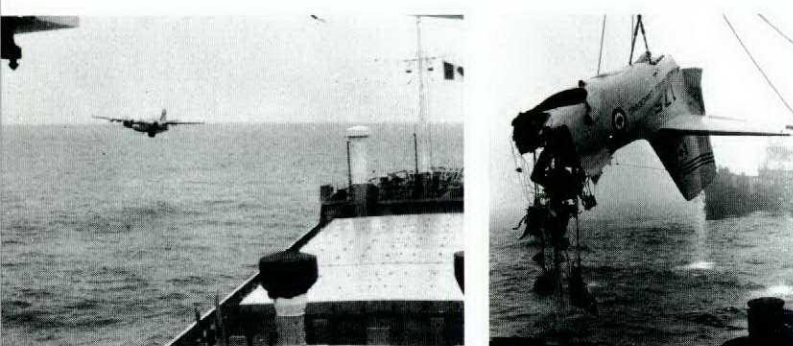
cont'd from page 19

was relatively inexperienced in fixed wing flying although a highly competent chopper driver. We'll never know.

A CF104 crashed into a hillside partway along a radar route for the same probable reason as the last one I mentioned. We know the pilot was competent, we know he knew better. Apparently it didn't matter.

"Hindsight" "is noted for being 20/20." You'll get no argument from me on that count, but let's really be honest. How many of us know of at least one guy who is "an accident waiting for a place to happen?" I think a lot of us do, and if and when that accident actually does happen we'll sit around piously and roll our eyes and tell each other about poor Joe

cont'd on next page



Blow's incidents which finally culminated in the real one. Each of us will have had a hand in Joe's execution.

Why don't we prevent these accidents? Because pride goeth not until after the fall, in actual fact, and none of us wishes to destroy the pride of a fellow aviator. We'd rather defend his pride and let him kill himself — or perhaps kill us.

I'm not saying that we should inform on the guy, I'm saying that we should inform the guy himself. Often that's all that would be needed. A short, serious talk, a little advice, and a lot of our problems could be prevented. Most of us are a little beyond the kindergarten stage. Sure we err, sometimes accidentally, sometimes purposely. Most of us, err, get "the word", and go forth presumably to "sin no more." We are the lucky ones; the unfortunate ones never get "the word" whether because everyone else is too "nice" to give it to them, or because their first big mistake is also their last. I suggest that we might well start on the ground when we're all on the war story telling kick. Some war stories indicate accident potential. They should be interrupted by a little well-directed preaching. "Unusual attitudes" don't always involve aircraft in weird positions. Sometimes they are symptoms of forthcoming problems with pilots. Sometimes a pilot with a bad habit or two needs further instruction; sometimes such a pilot shouldn't even be flying. The only thing that can be said for certain is that doing nothing is not going to help.

OK — so that covers the guys among those listed above who were known to be a little ropey or to exhibit some immature or marginal traits, but what about those who were neither immature nor inexperienced nor in the least "marginal"?

Therein lies the problem. It seems almost impossible to predict who is going to do what silly thing next. Perhaps we become complacent. Perhaps we say to ourselves "Hell, I've got over (one thousand, two thousand, three thousand — choose the applicable statement) hours and nothing is going



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- 1 morale**
- 3 if you think statistics lie -smoke!**
- 4 man's rationalizing motives and flight safety**
- 5 'all is not well that ends well'**
- 6 flight into danger revisited**
- 9 the narrow path of good judgment**
- 9 a calculated risk**
- 10 good show**
- 12 venerable a.o.p's'**
- 14 engine trend monitoring**
- 17 experience is only valuable if you use it**
- 18 observed in incident report**
- 19 the devil at six o'clock**
- 20 the saga of the 'jules verne'**
- 22 seaking tips, gen from 210**

Editor Capt John D. Williams
Art & Layout DDDS 7 Graphic Arts

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to happen to me.

WRONG. When you begin feeling that way, something is starting to happen to you. You are beginning to feel omnipotent, and that is something my friend which you most assuredly are not. You are acting at that moment almost as ludicrously as the "Olde English King" who sat by the sea-side and ordered the tides to recede.

If you don't get my point let me put it more clearly. It seems obvious that we flyers have one major enemy, and that is "THE GROUND". That enemy is always lurking in the background — has been since the first aviator did his trick.



And yet I have just mentioned some 16 of our colleagues who apparently forgot about it — or ignored it. They sat in their expensive metal thrones and ordered the ground to recede because they were doing more important things — and the ground responded with its totally predictable action. It just sat there and waited.

Why do we do these things? Do we have a deathwish? Psychiatrists have probed our innermost thoughts and they say no. I have no theory about why we do, but I have available to me the files of thousands of pilots who lapsed for whatever reason and I can summarize what they did wrong for you — so that maybe, just maybe you won't repeat their errors. No. Better than that I'll tell you how to stay alive.

FLIGHT PLAN If there is one place you don't need surprises, it is in a cockpit. If you plan meticulously considering all possible variables you will avoid those gut-grabbing moments described by some as "oh-ohs" — or you will minimize them as much as possible, but only if you:

FOLLOW THE DAMN THING There is precious little to be gained from careful planning which you later disregard. Almost all of our friends who pranged enroute were in possession of properly annotated maps, were aware of their position, knew what the weather had to offer, and motored on anyway. All they had to do was *follow their own plan* and they would be with us today.

STUDY As had been pointed out to all of us ad nauseum, flight is a science in which there are numbers and rules, and if you don't know them and follow them the earth will surely rise up and bash you.


DISCIPLINE The Forces didn't give you an airplane for your own personal enjoyment — they gave it to you to carry out a clearly defined mission. That is not to say that you cannot have fun, it is to say that deviation from the mission is a breach of faith with your employer. Get your jollies by doing your assigned task to perfection — or get out. Its as simple as that. If you are contemplating doing something with your airplane — ask yourself "Could I report this to my commander?" If the answer is "No" then your course of action is obvious.

ANTICIPATE Before you get the wheels in the well on any mission, ask yourself "What is the worst situation in which I might find myself on this mission, and what am I going to do about it?" Try several scenarios since possibilities are limitless. For example:

- | | | |
|------------------|-----|----------------------------------|
| Wings Fall Off | --- | EJECT |
| Weather gets bad | --- | Punch up or turn around |
| Engine Quits | --- | Eject or relight (depends where) |
| Nav aids fail | --- | ETC. ETC. ETC. |

The point is that if your mind is already made up, you won't run out of airspeed, altitude and ideas all at once — and or age-old enemy *the earth* will not smite you — as it has so many of our friends.

Oh incidentally — does this article sound sort of familiar to you? It should, since about half of it was published five years ago in a piece called *The Devil at Six O'Clock*. Actually all I had to do to update it was change a few numbers — upwards of course. If it weren't so sad it would be sort of funny. One of my best friends, a guy I flew with for five years on two different squadrons used to love debating some of the points made in the original. My son, born just two months ago bears his name, but he will never get to know the man he is named after, a guy he would surely have idolized. That man joined the list of preventable fatalities in this update.

Don't come to me therefore with some line of crap about preaching too much, or repeating something too often. Read this thing and think about it. You aren't too smart, too experienced, or too infallible to get something out of it. If you think you are, you are guaranteed a place of honour in Update #2. 

Once the sensual pleasure of controlling an aircraft is mastered, exhilaration diminishes and incurable habit takes command. Once the secretly nursed conviction that something dangerous and dramatic might happen—with yourself as hero or victim—is forgotten, then the heart joins the mind in submission to the necromancy of flight. Pilots who have flown for fifty years are unable to shake it—whatever it is.*

Perhaps. However I have discovered, sometimes under the most ridiculous of circumstances, that romance can truly be smashed by heart rending moments of sheer terror. "Terror" may not be the most descriptive word, however, "extreme concern for ones posterial safety" is surely a phrase which will suffice.

Too often in the years since I joined the forces have I found that just when everything is operating smoothly, is the time—the worst/best time—for situations to occur which had or could have had a profound effect on my immediate future.

All of this preamble is leading up to the fact that slowly but surely (as my age and the age of my trusty bird increase) romance is going out of my life and is being replaced by comfortable companionship. This is not to say that we don't have

Ernest K. Gann's "Flying Circus"

the odd fling together, however, I am now learning to head think rather than heart think, a situation which my real life lover heartily applauds.

If you think that all of this is as fertilizer for the lawn, do as I did one day not long ago. I was on the Flight Safety Officer's Course, and one of the guest speakers asked us to make up a list of those fellows we knew who had gone to the great flying school in the sky. My list was too long, much too long, and I wondered whether or not they could have decided their fates more favourably to all concerned by thinking with their heads. I didn't have to ponder long—I had been involved in some of the Boards of Inquiry—I knew that some of them had bought it showing off in front of friends, some were trying to impress their peers, and some of them went flying when they shouldn't have rather than appear "chicken" in front of their bosses or fellow pilots. What a waste!

Remember, there are situations over which we have no control, however, too often accidents occur when we could have prevented them. There are only three prerequisites for safe flight: ALTITUDE, AIRSPEED, and BRAINS. A pilot can lose any two of two at once and stay alive.

Capt Pete Growen 414 (EW) Squadron

Head versus Heart

