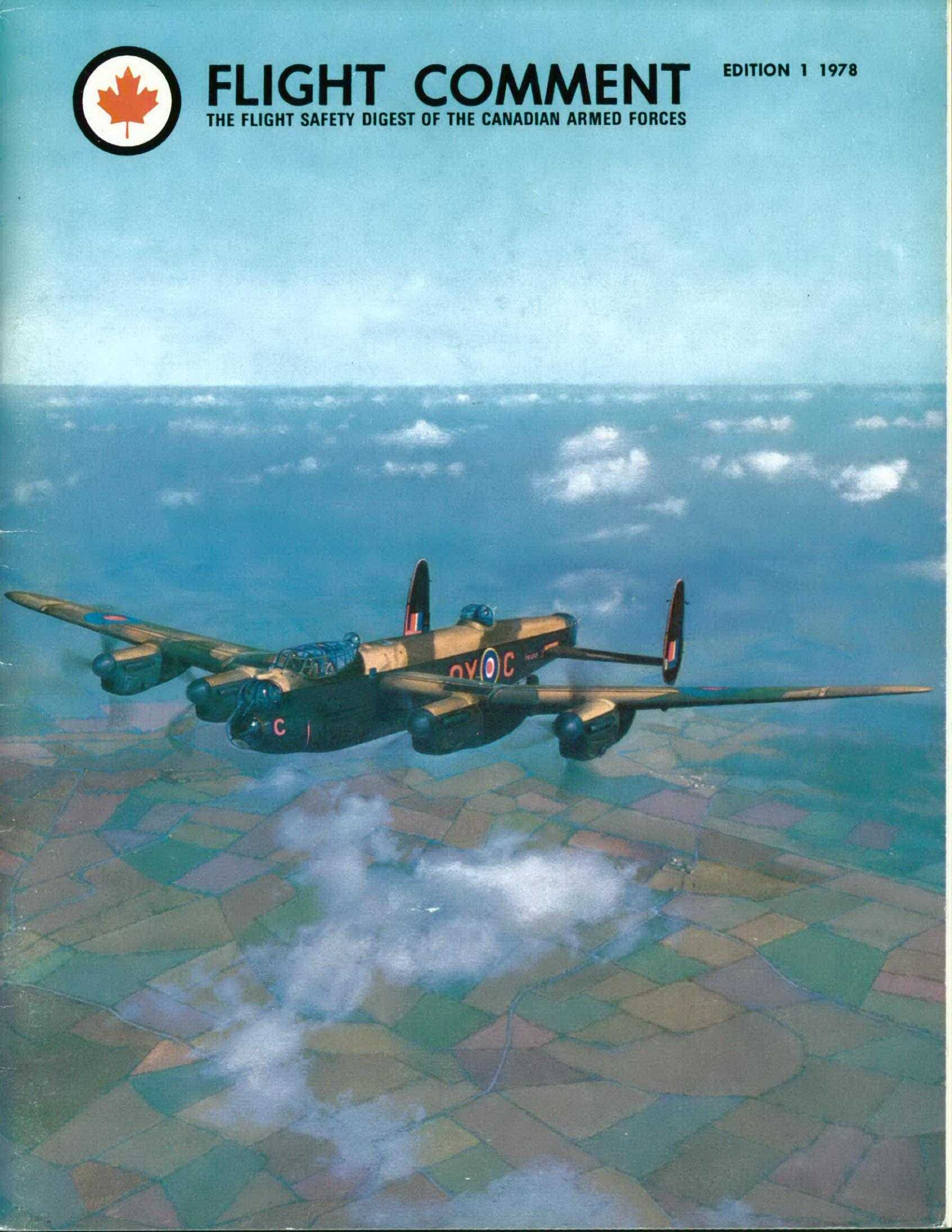
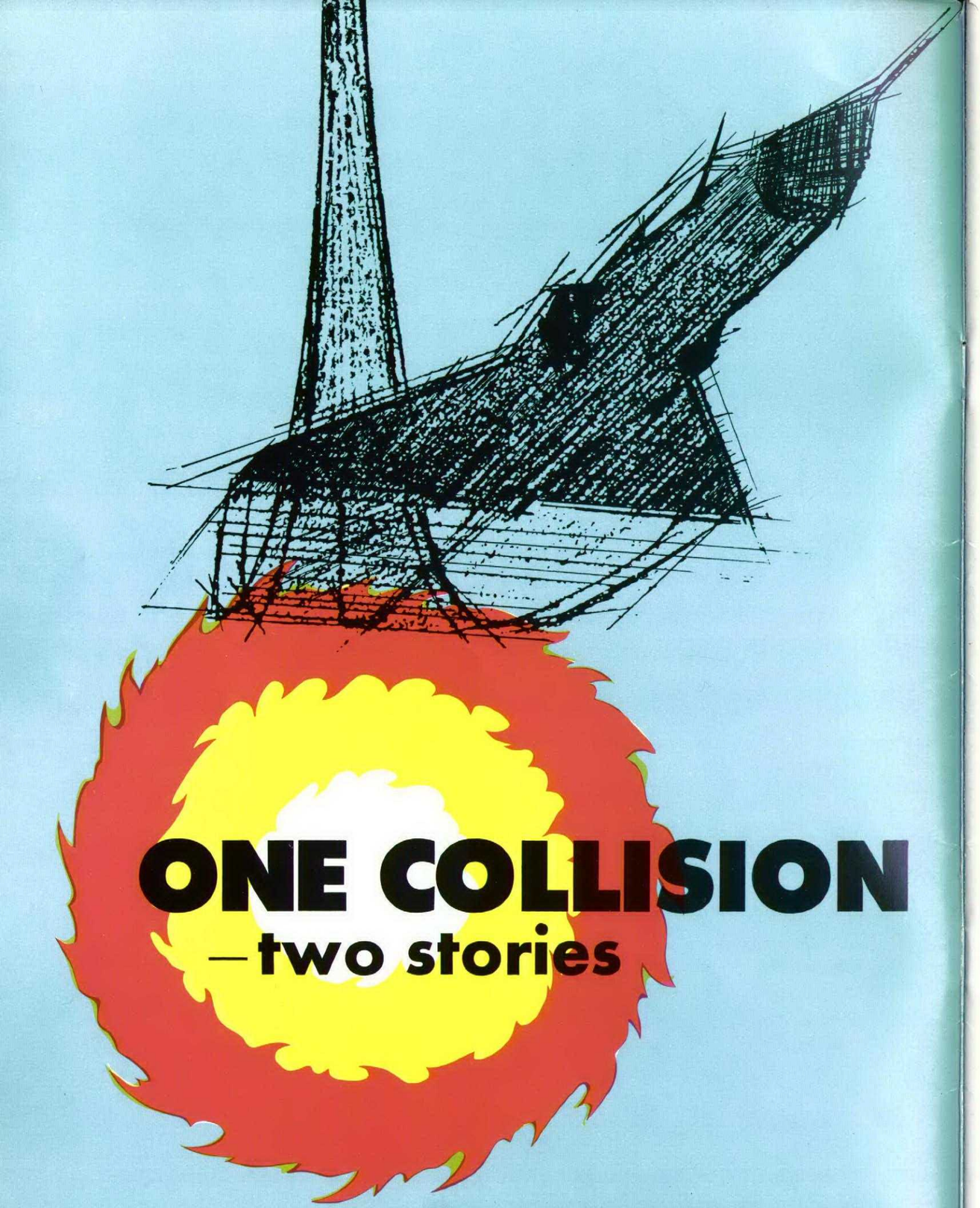
FLIGHT COMMENT

THE FLIGHT SAFETY DIGEST OF THE CANADIAN ARMED FORCES

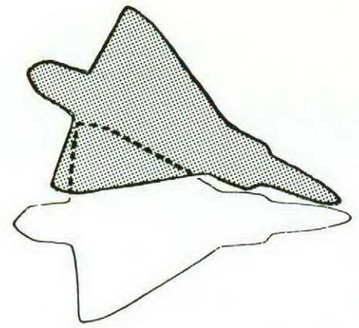
EDITION 1 1978





ONE COLLISION
—two stories

The collision reported below was due to the mutual loss of visual contact between two pilots attacking the same target. Initially simple, the air situation quickly became complicated and chaotic. The rapid deterioration of events was due to an accumulation of errors none of which was critical in itself: incorrect English phraseology, inadequate co-ordination between Operations Rooms, the-fact that the radar altimeter was not available and less-than-adequate high-altitude visual performance.



Cocon 31

My mission was to provide defensive support to three Kilos, the leader and right wingman of which were teamed up. I took off shortly before the patrol after a last-minute check with them.

I climbed out under Approach Control and contacted the OPS Room on Frequency 22, monitoring Frequency 1. I asked OPS whether my Kilos had taken off yet; they said no and instructed me to intercept two Bravos. I replied that my mission was to provide defensive support for the Kilos but that in the meantime I would intercept the Bravos.

The interception took place and at the end of the engagement I was "shot" by one of the Bravos that I saw break away. OPS then vectored me to heading 200 and advised me that the Kilos had taken off and were climbing.

I made a shallow climbing left turn from heading 200 to 030 and levelled off at FL 420, full throttle, afterburner on.

With my heading stable on 030, altitude 42,000 feet, I saw three aircraft at 3:30-4 o'clock low, with two in formation approximately 10,000 feet below me and the third on their left 5,000 feet above them. They crossed my flight path from right to left. A few seconds before, the controller had reported the Kilos' range to be approximately 15 nautical miles. I don't remember the other OPS transmissions other than that there was a Charlie Bravo at 12 o'clock/12 NM about to intercept me. At this point I established visual contact with my Kilos, range 3 to 4 NM. I concluded that another fighter was coming after *me*, not to intercept my Kilos.

Upon establishing visual contact with the three Kilos, I altered my heading in their direction approximately 20° to the right. The two aircraft in formation rolled out of their turns, and established themselves on heading 020, while the third one passed underneath me three to four thousand feet below. He reappeared on my left and turned towards me in a steep, almost vertical climb. When he was just opposite me, approximately fifteen hundred metres away, I broke towards him; we met and passed. Deciding that he posed no further threat, I broke off to the right to rejoin the other two Kilos, which I had not lost sight of. I heard Kilo 3 say over the radio, "I've just lost him against the ground". Not having to worry about this aircraft for the moment, I felt I could safely continue my manoeuvre.

Suddenly, an extremely violent impact

I proceeded to make a left turn of approximately 270°, which put me within firing range, six hundred metres or so, but I was not in line. The two Kilos on patrol tightened their turn a bit and it looked like I was going to overshoot. As I began to roll out of the turn to climb and renew my attack from above, I felt an extremely violent impact . . . . and my aircraft exploded! There was a tremendous white flash which illuminated the whole instrument panel, and an extremely violent blast of air engulfed the cockpit. Had I lost my canopy? I couldn't be sure. It felt like I was in a nose-down spin; the airplane seemed to be turning in every direction at once. I felt another impact and something hit me on the head: it must have been the flapping of the ejection control curtain. I tried to grab it but couldn't raise my left hand – the gyrations of the aircraft were too chaotic. It all happened so fast. I managed to grab hold of the curtain with my right hand, I pulled it down and bailed out!

I was no longer wearing my helmet or oxygen mask. I don't know whether I lost them before or after pulling the curtain down; the suction in the cockpit probably tore them off. I don't remember whether I had fastened the chin strap of my head harness before taking off. I may have, I usually do.

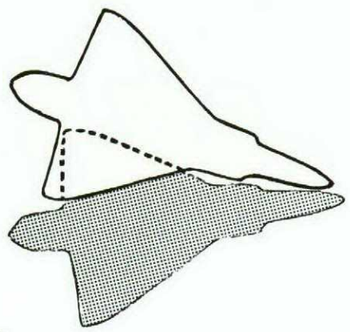
The ejection proceeded normally: the stabilizer deployed immediately and I began falling. I felt a stabbing pain in my back, and had difficulty breathing. I panted and gasped for breath. I didn't feel cold, however. Still in my seat, I tried to catch my breath and checked to make sure all my limbs were still intact. The Alps were not far away. My parachute would open at 10,000 feet and at least the region was familiar to me.

I then got a three-quarter rear view of the shape of an airplane as it flashed by me. It was all blackened, as if it had been burned, but it still seemed to be flying. Turning slowly as I fell, on the other side I noticed several pieces of an airplane which were falling and soon caught up with me. Seat-man separation took place as expected around 10,000 feet. Although the opening shock was slight, I felt a stabbing pain in my back. I tried to see whether I could reach the two quick-release fasteners on my seat pack despite my pain. I could, so I decided to wait as long as possible before releasing it so as to minimize any pendulum effect.

Continuing my descent, at about 6 to 7,000 feet I noticed another parachute north of my position at approximately one thousand to fifteen hundred metres, slightly above me. At first I though it was my seat, then saw that it was a man. Was there an airdrop in progress? And then I finally realized that I had just been involved in a mid-air collision with Kilo 3!

At 3,000 feet I released my seat pack and during the rest of my descent I tried to steer my parachute in the direction of the only road, a small one, that I could see in the area. I was successful in my attempts, despite the pain in my back, and landed on the exact spot I had chosen, between two trees two metres from the road. The landing shock was not excessive but I felt a sudden pain run up my back which made me scream. I could hear airplanes circling above my position and I tried to get up. I dragged myself to my feet and pulled my parachute over onto the road, although with great difficulty. I spread it out in the middle of the road and lay down on the shoulder to wait for help to come. I saw an aircraft directly overhead and waved to him. He flew over two or three times and then went away. I was certain that he had seen me.

Fifteen to twenty minutes later, a Renault 16 pulled up and two men got out. They had seen me come down and had come to my assistance. One of them went to notify the Gendarmerie and fifteen minutes later the firemen and police arrived, accompanied by the pilot of the other aircraft with which I had collided.



Charlie Bravo

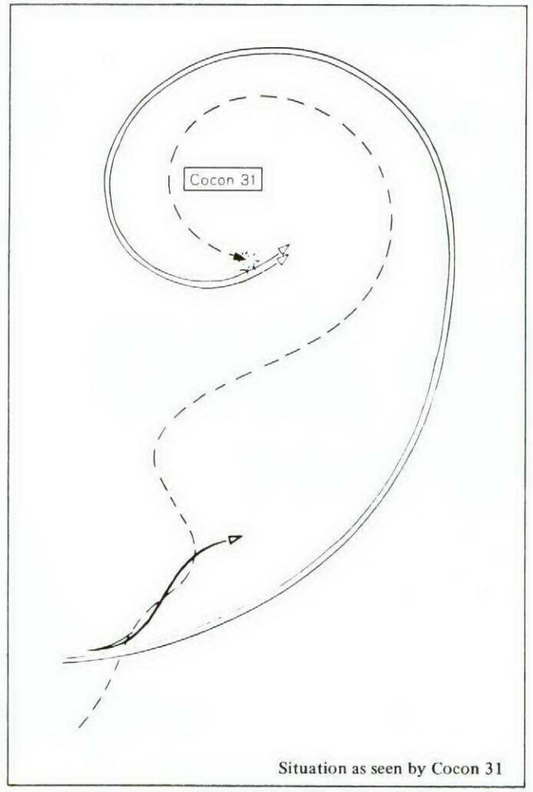
Low on fuel, my wingman returned to base. I made a 270° right turn and assumed a heading on the order of 170° as instructed by OPS. I received further orders to alter my heading another 20° to the right, which I did. On the secondary frequency, Frequency 1, I heard a Cocon say something. Although I couldn't hear all sides of the conversation I gathered that there were other Cocons airborne. To verify I called in to OPS asking how many there were and the reply was "three Cocons at 35,000 feet". I levelled off at FL 300 under their contrails, establishing a 0.98 MN.

I figured that a patrol of two Cocons, probably the ones the lone Cocon had been waiting for before the earlier engagement, had joined up with him to counter my attack.

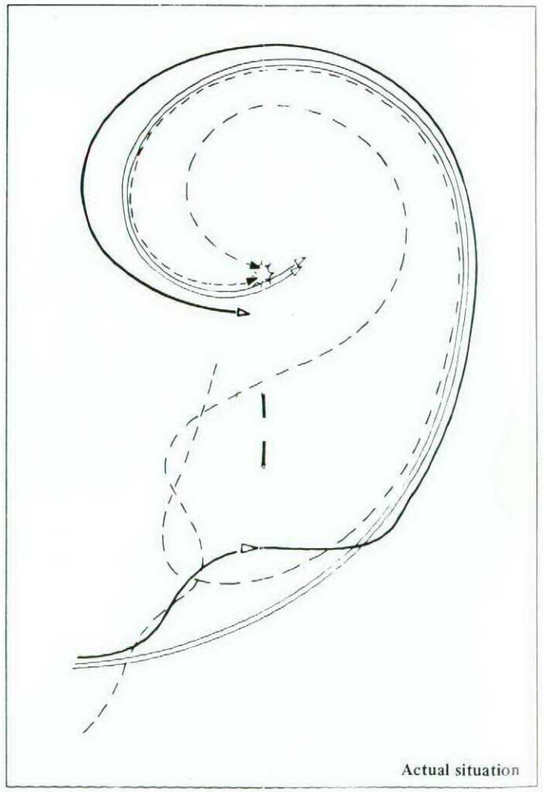
OPS transmitted their position to me several times during my interception approach. As I still did not have positive identification, I requested confirmation that they were indeed Cocons. OPS replied in the affirmative and vectored me towards them.

I established initial visual contact with two aircraft in combat formation at 12 NM. They did not appear to be in any rush. Five seconds later, with all previous flight conditions stable, I spotted the third aircraft, closer to me and in defensive formation relative to the two others. He was flying slightly (2,000 feet or so) above the patrol at approximately 35,000 feet and moving faster than they were.

I reported visual contact with three aircraft, rolled into a relative turn in the direction of the lone aircraft and yelled "tally-ho". He went into a climbing turn to the left and, after deciding that he was no longer a threat to me, I switched on the afterburner and directed my attack at the two-aircraft patrol. They made an immediate wide level left turn and, 30° after rolling into the turn, I was 2,000 feet behind and below them. On frequency 1 I heard, several times, the patrol being ordered to continue its turn. I had to get them before the third one came after me. I loosened my harness locking device to check my rear sector. While on a more or less northerly heading, I got off a few short film bursts at 1,200 metres, with the intention of breaking off the combat manoeuvre should the third guy come back. I could still see no one behind me but heard the lone fighter transmit that he had lost sight of the group. In front of me, the patrol immediately tightened its turn, an expected manoeuvre since they had lost their defence, which gave me a better shot at them. At a range of 600 metres, heading 060, I was about to start filming when . . . .



Situation as seen by Cocon 31

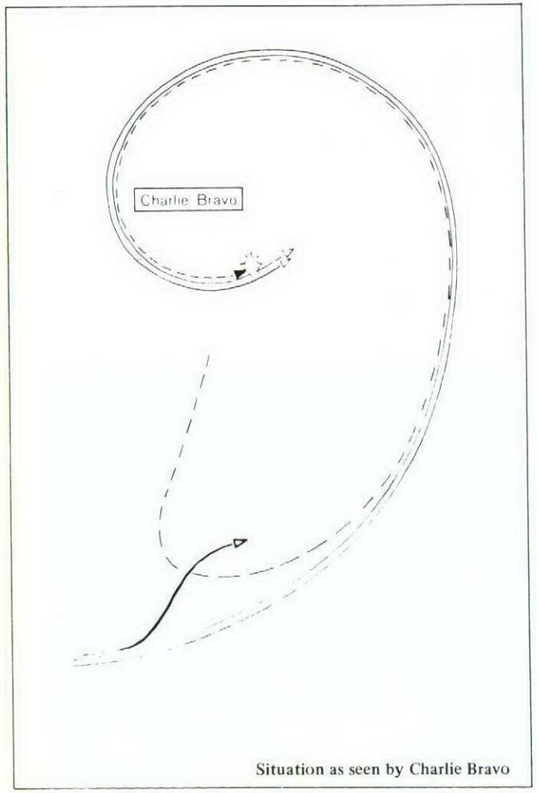


Actual situation

A total loss of control

All of a sudden and without warning my aircraft flipped over to the left and assumed a series of uncontrollable flight attitudes which subjected me to high "g" forces. My first thought was that I had lost my left wing and that my aircraft was breaking up in flight. I couldn't see anything outside, perhaps because everything was happening so fast! I managed to grab hold of the stick and transmit "ejection", but got no mike return. All of a sudden, the "g" forces seemed to decrease for a moment and I managed to grasp the upper ejection control and, after bracing myself in position, to pull the curtain down with both hands. I ejected successfully.

The first thing I felt – the blast of air – was quite tolerable, and this reassured me and prepared me for the shock of initial separation. Compared with the "g" forces to which I had been subjected, I hardly felt it at all; indeed I felt a sensation of calm. I quickly let go of the curtain after feeling a small shock. I was sitting high in my seat and looked up to make sure the seat parachute had deployed. My descent was very rapid. All my equipment was intact; my visor was down and I was breathing normally in my mask. All of a sudden I saw the remains of an airplane go by. I placed my right hand on the first separation handle, ready to take action should the ground start coming up at me too fast. I waited. Suddenly I felt a shock, my descent was arrested, and I was as if suspended in mid-air, no longer in my seat, with the fully-deployed canopy of my parachute above me.



Situation as seen by Charlie Bravo

I looked down at the ground and could see that I was slowly drifting in a north-to-south direction towards a chain of hills, with cliffs. I released my seat pack, the dinghy inflated as it was supposed to but began to swing back and forth rather violently. I pulled down on the shroud lines to avoid the cliffs but quickly grew tired; my efforts were not having much effect. I was sure I was going to fall right on top of the cliffs. At about 20 metres from the ground I jettisoned the dinghy and pulled down on the lines, into the wind. My landing was not hard, in a clump of bushes and shrubs.

My dinghy and first aid kit had landed three metres away. I felt no pain. I heard the sound of an aircraft, removed my chute and saw a plane circling overhead. Moving out into an open area, I took off my life jacket and brandished it to draw their attention. The plane circled overhead at about 1,500 feet; I was sure they had seen me. I walked down the hill through a hollow towards the valley, where there was a road and a farmhouse. Fifty metres from the road I heard a siren and started running to flag down the approaching police van and fire truck. The police told me that another "parachutist" had come down not far away. For the first time it dawned upon me that I had just had a mid-air.

I got into the van and, as they had said, we came across the other pilot two kilometres down the road, with two persons standing nearby.

You're not alone up there!

The figures for Air Force mid-air collisions between 1965 and 1976 prove it! Consider the following breakdown:

Near a landing field	10%
Low altitude	43.3%
While manoeuvring	23.3%
High altitude	23.3%
While flying in same formation	63.3%
While changing or flying in different formations	13.3%
Unplanned formations	6.6%
Other	16.6%
Error in judgment	46.6%
Inattention	13.3%
Failure to look around	30%
Failure to obey orders	10%
Combat	76.6%
Primary flight, "wings standard" and jet fighter training	23.3%
Day	90%
Night	10%

– No, the sky doesn't belong to you!
– No, two is not company!
– No, the little guy doesn't always get out of the big guy's way!
– It is a sad fact that 90% of such collisions take place in perfectly clear weather!

Conclusion: Get Your Head Out of the Cockpit!

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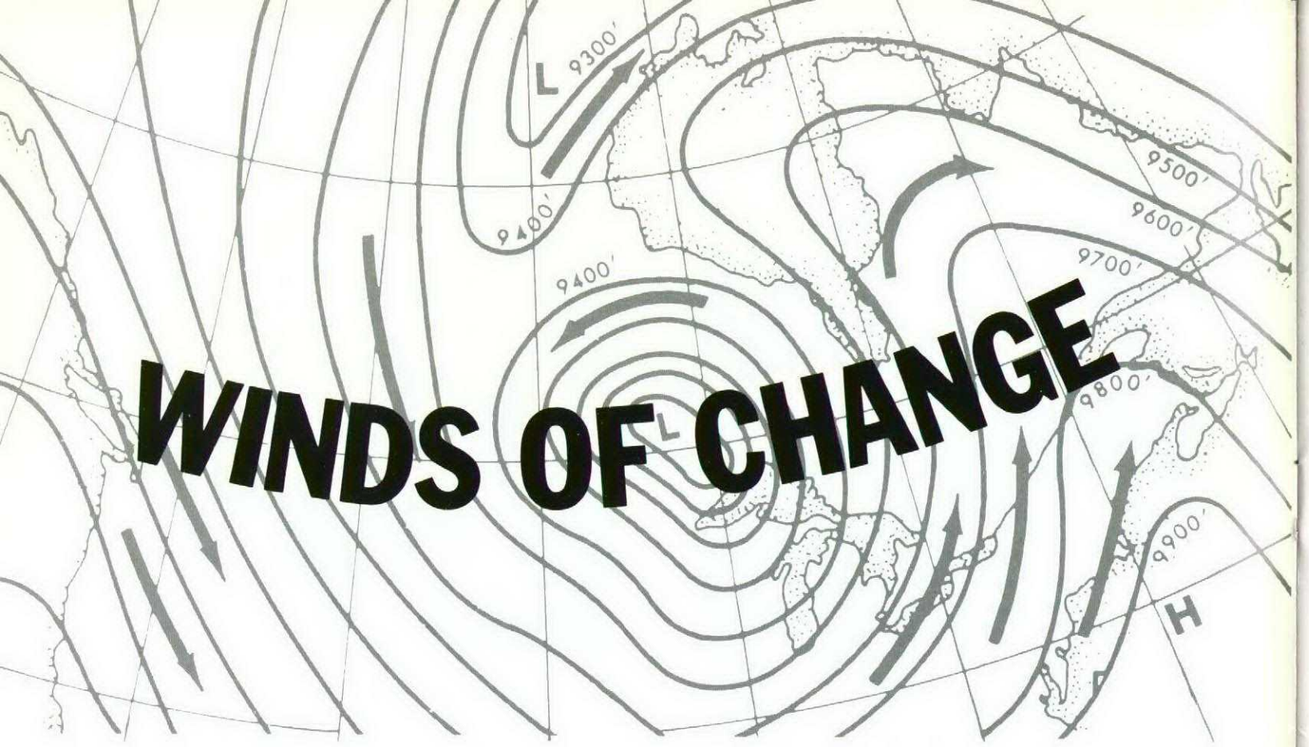
courtesy of the BSV
of the French armée de l'air



WINDS OF CHANGE

By Mr. R.B. Saunders

Changes *are* in the wind for the Canadian Forces Weather Service (CFWS). Already in weather offices at CFBs Moose Jaw, Cold Lake and Edmonton, Met Techs are giving weather briefings formerly provided by civilian duty forecasters. Here, and at other bases across Canada, a major reorganization of the CFWS is being put into effect.

To understand the extent of these changes and the need for them, it is necessary to review briefly the composition of the CFWS.

The Canadian Forces Weather Service

As CF aircrew are well aware, the meteorological support at CF bases is provided by the CFWS. This Service is maintained and operated under cooperative arrangements whereby the Department of the Environment, through its Atmospheric Environment Service (AES), is the source of professional meteorologists, meteorological equipment and most of the communications for the CFWS. Technician staff of the CFWS are military personnel who are provided by the CF as members of the MOC 121 (Met Tech) trade. It is the need to ensure fully effective employment of the meteorologists seconded to DND, and of the military Met Techs, in meeting CF meteorological support requirements, that has recently triggered the reorganization of the CFWS.

The Seconded Civilian Meteorologist

Since the early sixties, the meteorologist seconded to DND has not been utilized in the same manner as his counterpart in AES. While the AES meteorologist has been working full time as a forecaster and has been acquiring skill in the use of ADP techniques in the forecasting role, the DND meteorologist has been continuing to serve both as a forecaster, unaided by a local computer, and as a briefer. His geographical area of responsibility has been smaller, generally, than that of his AES counterpart and much of his time has been spent in briefing, a function which is the responsibility of technicians in an AES weather office. Because of the difference in responsibilities, the forecaster positions in AES were reclassified, in 1975, at a higher level than many of the forecaster positions with DND. Thus seconded positions at many DND bases have become increasingly unattractive to meteorologists.

The Military Meteorological Technician

Similarly, utilization of the full potential of the military meteorological technician has fallen behind that of his civilian counterpart. Although AES Presentation Technicians have been providing weather briefings at civil airfields for many years now, the CF Met Techs qualified for weather briefing duties have been employed in that capacity only to a very limited degree, primarily in HMC Ships and at a few locations ashore. This situation has restricted the development of the Met Tech trade, and was reported in the ORCDP Advisory Paper MOC 121 as a source of serious dissatisfaction.

The Cost of Technology

But the CFWS has encountered yet another problem – the increasing cost of maintaining compatibility with the Canadian weather forecasting system as AES acquires the products of new technology. As new but expensive techniques in data processing, remote sensing by satellites, and the field of communications are incorporated into weather office routines, it has become too expensive to acquire the necessary equipment for the CFWS as long as virtually every CF air base has its own *forecast* office.

REASONS FOR REORGANIZATION

Some means had to be found to enable DND to keep pace with technological advances in the field of meteorology, maintain a viable and healthy Met Tech trade, and employ meteorologists and Met Techs most effectively. The answer, as recommended by a Study Team comprising NDHQ and Command operational personnel, and as approved by the Program Control Board, is a reorganization which will place the CFWS on a sound foundation to meet the future requirements of the CF.

THE NEW ORGANIZATION

What then is this new organizational plan? Briefly, the concept comprises three main features: the centralization of the forecasting function; expansion of the employment of Met Tech briefers; and the provision of rapid and reliable means of communication between briefers and forecasters.

Canadian Forces Forecasting Centres

In future the CF forecasting function in each of several geographic areas will be concentrated in a Canadian Forces Forecasting Centre (CFFC). Specifically, CFFCs will be organized through expansion of the existing facilities at CFWO Edmonton, 22nd NORAD Region Weather Centre North Bay, and the CF Meteorological and Oceanographic Centre Halifax, to serve DND bases in the Prairie Provinces, Ontario and Quebec, and the Atlantic Provinces, respectively, with minor exceptions.

These centres will be equipped with photo facsimile equipment to receive satellite imagery, dedicated teletype circuit connections to the AES National Teletype System, and direct real-time access to computer-processed meteorological data. They will be manned 24-hours/day by meteorologists to provide specialized forecasts in support of CF activities within their designated area. Their responsibilities will also include the provision of guidance information to the Met Tech briefers at CFBs as listed below, and the issuance of the official aviation terminal forecasts for those bases which are underlined:

a. CFFC Edmonton – for *Edmonton, Cold Lake, Moose Jaw,* Portage la Prairie and Winnipeg
b. CFFC North Bay – for Ottawa, *Petawawa, Bagotville, Valcartier* and *Chatham*
c. CFFC Halifax – for *Gagetown, Shearwater* and *Summerside*

Where bases are located at civil airfields (e.g. Ottawa and Winnipeg) the terminals forecasts will be issued by AES Weather Centres as at present. Similarly, arrangements will be made for the Prairie Weather Centre at Winnipeg to issue the terminal forecasts for Portage la Prairie.

Although only now being implemented at CF air bases in Canada, the concept of centralized forecasting was introduced four years ago in 1 CAG, where the meteorologists in CFWO Baden do the forecasting for both Baden and Lahr air bases, and provide guidance information to the Met Tech briefers at the latter base.

Weather briefing – ole style (Does anyone know their names?)

Weather briefing – new style – at CFB Moose Jaw, where Sgt G. Chow is shown imparting weather advice to LCol T.A. Lyons, BOpsO and Capt T.M. Kemp D/BFSO

Under the new organization, however, not all CFWOs in Canada will depend on CFFCs for guidance and forecasts. Because of special circumstances, CFWOs Comox, Trenton and Greenwood, as well as the CF METOC Centre Esquimalt, will continue to retain a forecasting capability.

The Role of Met Tech Briefers

With a few exceptions, weather briefings in the reorganized CFWS will normally be given by Met Tech briefers. CF Met Techs, after a number of years of weather observing experience, are given appropriate training, in accordance with the MOC 121 trade specifications, to qualify them for weather briefing duties. In this role they are much more than mere readers of weather reports and forecasts. Their understanding of synoptic and physical meteorology and knowledge of weather-influencing factors, such as topography, enable them to explain meteorological events in terms of the associated physical processes.

Although not qualified to issue or amend forecasts, Met Tech briefers can adapt, or elaborate on, forecast information and, of course, will obtain updated weather information and guidance from their associated CFFC whenever necessary.

At each CFWO except Toronto, Met Tech briefers will be working under the direction of an experienced meteorologist who, as Base Met Officer (BMetO), will be responsible for supervising the weather office programs and for providing professional meteorological consultation.

CFFC – CFWO Communications

To facilitate the effective functioning of the new system, appropriate arrangements are being made for a rapid and reliable means of communication between the CFFC and its dependent CFWOs. For example, a dedicated telephone link has been provided between Edmonton and Moose Jaw to enable prompt communication on meteorological problems, the timely provision of additional guidance by the forecaster, and the speedy transmission of reports on significant weather phenomena in the local area by the briefer. At most bases, the assignment of appropriate priorities on existing facilities will ensure adequate telephone contact between forecaster and briefer.

IMPLEMENTATION SCHEDULE

The reorganization is already in progress. On 1 October 1977, the CFWO at CFB Edmonton was officially redesignated as the Canadian Forces Forecast Centre Edmonton (CFFC Edmonton) and began issuing all terminal and special forecasts for CFBs Edmonton, Cold Lake and Moose Jaw. The responsibility for met briefings at these bases is guadually being transferred from the duty meteorologist to the Met Tech briefer, the full transition to be completed by 1 January 1978.

Scheduled Changes for 1978

Effective 1 January 1978, the 22nd NORAD Region Weather Centre will be redesignated as CFFC North Bay and begin providing guidance and special forecasts to CFBs Petawawa and Ottawa and terminal forecasts for CFB Petawawa. The responsibility for met briefings at North Bay and Ottawa will be transferred to Met Tech briefers on a progressive basis, with full changeover to be effected by 1 April 1978. (Met Tech briefers have been providing service at Petawawa for many years now).

Also effective 1 April 1978, CFFC Edmonton will assume its full CFFC responsibility for CFBs Portage la Prairie and Winnipeg, except that the official terminal forecasts for these bases will be issued by the AES Prairie Weather Centre. The responsibility for met briefings at Winnipeg and Portage la Prairie will be transferred to Met Tech briefers on a progressive basis during the period 1 April to 1 July 1978.

Between July and December 1978, CFFC North Bay's responsibilities will expand to include the provision of terminal forecasts and support for CFBs Bagotville, Chatham and Valcartier. Also during this period the CF METOC Centre, Halifax will be redesignated as CFFC Halifax and will assume its full responsibility for CFB Shearwater and CFB Gatetown, including the issuance of terminal forecasts. By the end of the year, the full transfer of briefing responsibility from the duty meteorologists to the Met Tech briefers at the above CFBs will be completed.

Scheduled Changes for 1979

The change to the new organization at CFB Summerside is scheduled for the first quarter of 1979, as CFFC Halifax assumes its full responsibility for that base and the Summerside Met Tech briefers commence their briefing duties.

Thus, by April 1979, the CFWS reorganization, as currently authorized, will be completed. With few exceptions, the requirements of CF aircrew for weather briefings at CFWOs will be fulfilled by Met Tech briefers, fully supported by and receiving forecast guidance from a CFFC.

EFFECT OF REORGANIZATION ON SUPPORT TO CF

One of the basic principles laid down during the studies leading to the reorganization of the CFWS was that there must not be any reduction in the standard of meteorological service to the CF. All of the changes mentioned above have been designed with that principle in the forefront.

CF Met Tech briefers are highly qualified for the weather briefing role, and are unquestionably capable of providing excellent briefing services as evidenced by their work in HMC Ships, at CFB Toronto and at Lahr, and on special assignments in support of SAR and MOBCOM activities. In addition there is the fact that these Met Tech briefers are supported continuously by the dedicated forecasting unit of a CFFC, comprising a group of experienced meteorologists who are able to concentrate on CF weather prediction problems, with the assistance of new technological developments which could not be provided to each DND forecast office under the old organization.

As with most reorganizations it is expected there will be a period of transition and adjustment; however, with the cooperation of all concerned, the reorganized CFWS will not only maintain a high quality of service to the Canadian Forces, but will do so through the challenging employment of Met Techs and meteorologists to full potential in their respective roles.

The Sixth Sense

There may be those who will dispute the hypothesis, but it has been said that seasoned helicopter pilots possess keener flying instincts than other fliers. There may be a case for disagreement. But record books bulge with accounts of daring missions, performed under seemingly non-survivable circumstances, in which the chopper pilot and his crew returned unscathed.

Low level missions with minimum navigation equipment, pick-ups in pitch black jungles, shattering ground fire – these are a few of the obstacles surmounted by helicopter pilots in South East Asia alone. There are many cases – unchronicled for obvious reasons – in which reckless pilots on routine training mission pushed themselves and their fragile machines to the limit – and somehow lived to brag about it.

Instinct? Just plain luck? Or is there more to it than either of these obscure terms imply. A noted reporter once observed that helicopter pilots seem different from their fixed wing counterparts. He characterized them as introverts – whereas other pilots are extroverts – brooding, while their fixed wing buddies brandish smiles of confidence. The reason, he surmised, is that chopper pilots are conditioned by their environment to assume that if something critical hasn't already happened during their flight, it soon will. This reporter was implying, possibly without realizing it, that helicopter pilots have a kind of 'sixth sense' which often alerts them to impending danger. Identifying this sixth sense as the sign of an introvert might be a little rash, however, since many helicopter pilots are rather famous for their extroverted antics.

An old wives' tale? Like the hunter who claims the ability to think like his prey, or the fisherman who 'reads' the water to find the big ones, few veteran helicopter pilots are likely to malign the existence of such a phenomenon. Participants who survive any type of potentially hazardous endeavour seem to develop such instincts – the high wire performer, the professional automobile racer, the bullfighter. The amount of danger involved very often helps determine the degree of such an instinct. Certainly all pilots – not just helicopter pilots – are imbued with the sixth sense potential.

But it may be more visible in helicopter pilots simply because their flying environment requires constant vigilance and split-second decisions at low levels. In this respect, helicopter flying probably relates closer to the old 'seat of the pants' flying than anything the Air Force offers. And this presents challenges and temptations – low altitude, low air speed, and a machine which its pilot may feel a part of – similar to those facing pilots of the open cockpit era.

While it is not difficult to imagine that a 'sixth sense' does exist, the prospect of explaining how it is attained is another matter. What are the ingredients of this unusual quality? Do helicopter students who have passed their first check ride suddenly find themselves ordained with such powers? No one has yet ventured to define all of its ingredients. However, there is little doubt that experience plays a great part in it. Natural powers of observation, deductive powers, common sense, and judgement are all involved in this phenomenon. And certainly a most essential ingredient is knowledge – of the aircraft's limitations and the operating procedures required to fly it effectively. Without this knowledge, there would be no pre-determined point at which a sixth sense could be triggered.

How many times have helicopter pilots broken off a routine manoeuvre simply because 'it didn't feel right', and subsequently discovered that their bird had developed a serious malfunction? How many others have ignored the warning signs during urgent missions and averted tragedy by the skin-of-the-teeth? How many more who 'had that feeling' didn't make it back?

Sounds, vibrations, handling characteristics – all of these have a special meaning to the helicopter pilot who has the experience, knowledge, and proficiency to detect their meaning. These factors seem to be part of the sixth sense and may be decisive during critical low level missions.

First indications that this instinctive warning system is about to trigger may be a feeling of uneasiness in the pit of the stomach, a cool sensation down the spine, or a tug of conscience that says 'don't do it'. Most often the sensation passes quickly and, sometimes, is overlooked until too late. The sensation doesn't always indicate impending disaster. It may simply be an indicator that something unusual is happening or about to happen.

How long does it take to gain the 'experience' necessary for this instinct? Many pilots never attain it. Some violate its effectiveness by disregarding the warning signals it emits. Pilots who are fortunate enough to develop this feeling, whether it's called 'sixth sense', 'common sense', or 'flying sense', are a step ahead of their machine to start with. Used effectively, this phenomenon can be a life-saver. Disregarded in favour of barnstorming tactics or other personal whims, and it becomes as impotent as a flaunted safety rule.

Combined with self-discipline, proficiency, and a sense of personal responsibility, this 'sixth sense' could be your guardian angel.

Courtesy MAC Flyer

GOOD SHOW

CAPT G.E. STEWART MCPL R.N. PRINGLE

On 20 March 1977, a civilian Cessna 172 registration CGNYV piloted by Nr. Ken Bimm of Rexdale Ontario was safely recovered at CFB Trenton following a pilot initiated "Mayday".

The aircraft, with two adults and two children on board, was on a VFR cross country flight from Pembroke to King City, Ontario. During the flight the pilot encountered a severe snow storm with low cloud bases and reduced flight visibility. The pilot declared an emergency after he became disorientated and eventually lost.

On initial contact with the pilot, Capt Stewart, the terminal controller on duty, determined that the pilot had approximately 100 hrs flight time and no instrument qualifications. He also determined that the aircraft was not transponder equipped and that it had no navigation equipment other than a compass. Radar was alerted prior to handover but no target return was observed. No bearing could be obtained from the lost aircraft on the tower VDF equipment.

Capt Stewart then asked the pilot to fly a heading of 180º and to maintain visual reference with the ground. Some minutes later the pilot reported intercepting a river at which time Capt Stewart advised the pilot to follow the river southbound, advise of any heading changes, and to call out any significant buildings, bridges, towns, etc. As the pilot followed these instructions Capt Stewart by map reading and through his knowledge of the local area, was able to determine that the pilot was following the Trent River and was just south of Campbellford Ontario. Capt Stewart instructed the pilot to continue following the river and when the aircraft approached the Frankford area a target appeared on radar. When the aircraft acknowledged passing Highway 401, Trenton radar assumed control for vectors to the aerodrome.

MCpl Pringle, the radar controller on duty, made three attempts to vector the aircraft for a visual landing at Trenton. On the first two attempts the aircraft was visible to vehicles on the ground but the pilot wasn't able to spot the runway. The pilot broke off the third attempt when he began to experience engine problems. On each attempt it was evident that the pilot was not familiar with radar procedures and was reluctant to follow directions. Finally, MCpl Pringle was able to win the pilot's confidence and on a fourth attempt, an hour and twenty-two minutes after the emergency was declared, the pilot sighted the runway and the aircraft landed safely.

In this emergency, standard procedures for recovering lost aircraft were of no use. The techniques that were used were developed by these two individuals as the emergency progressed and were undoubtedly responsible for the safe recovery of the aircraft and the four souls on board.

CPL G.W. FLEMING

On 15 March 1977 Corporal Fleming was carrying out a special inspection on CF116826. Upon removing the right hand auxiliary drive system panel, he found an excess of fuel pooled in the immediate area. Checking further he found that the interconnecting fuel manifold line was leaking.

He informed his supervisor, who in turn requested an aero engine technician to inspect the problem area. Upon further investigation an "O" ring between the afterburner manifolds was found to be unserviceable.

The area that this leak occurred in is quite inaccessible and not part of the maintenance check. Because of the relatively small amount of fuel found in the area and the inaccessibility of the area this leak could easily have gone undetected in which case it would have progressed to a major rupture.

Corporal Fleming's alertness and display of initiative in finding and subsequently conscientiously tracing the fuel leak to the source undoubtedly averted a very hazardous situation.

MCPL E.B. MUNROE

The pilot of a Twin Piper civilian aircraft enroute from the USA to Parksville B.C., with a stop over at Vancouver, found himself lost 30 minutes after departure from Vancouver. He was also encountering other problems, therefore, he wisely called for help. Comox RATCON answered his call and MCpl Munroe was assigned the task of locating the aircraft and recovering it. The pilot was in cloud, experiencing moderate rain and turbulence. He had internal cockpit problems as well: his defogger refused to function, thus his forward visibility was reduced to nil and his aircraft controls were very stiff to operate. At this point he appeared quite agitated and excited over the radio but MCpl Munroe's calm manner soon gave him confidence and he appeared to settle down.

MCpl R.N. Pringle

Capt G.E. Stewart

Cpl G.W. Fleming

MCpl E.B. Munroe

The aircraft was radar identified seven miles north of Qualicum, B.C., heading toward the land mass and higher mountains. MCpl Munroe determined the pilot's compass was not functioning correctly, and that he had no IFR experience and he had never done a PAR approach. Enroute to Comox, MCpl Munroe explained to the pilot how to fly a No-Compass PAR approach. The weather at Comox was 700 feet scattered, 1,200 feet overcast, two miles visibility in light rain. However, because of the cockpit layout, the pilot could not wipe the windscreen dry, therefore his forward visibility was nil. Using plain and simple terminology, MCpl Munroe literally talked the aircraft right down to the touchdown point. To quote the pilot "I didn't see a thing until I passed some green lights and landed".

Master Corporal Munroe's correct assessment of the serious predicament and his cool actions undoubtedly saved a valuable aircraft and more importantly, a human life. His action exemplifies the contributions made to flight safety by resourceful personnel of the Canadian Forces.

CPL W.W. BROWN CPL K.L. BUELL

Tutor 114125 was plagued with 20 intermittent left and right main undercarriage "unsafe up" conditions from the 7 Dec 76 until 23 Mar 77. During this time every conceivable undercarriage component had been changed, the aircraft hydraulic system had been flushed and seven air tests were flown serviceable for this snag. Because of the persistent nature of the snag, the aircraft had flown only a total of 57.7 hours during that four month period, the rest of the time remaining in the hangars unserviceable for undercarriage repairs and de-snagging procedures.

During an evening shift, while 2CFFTS and Snag Crew were working a heavy night flying schedule, Cpl Brown suggested to Cpl Buell that they investigate 114125, disconnect undercarriage hydraulic lines and flush them through separately. Upon removing one line and setting it on a bench they noticed a ball bearing approxinately 1/8 inch in diameter fall out. The ball bearing was small enough to be forced into a restrictor and act as a "check valve", shutting off hydraulic pressure to either the left or right main undercarriage actuators.

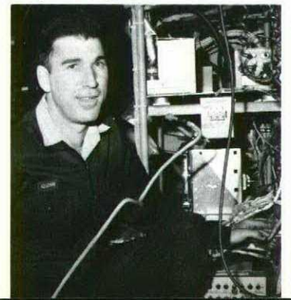
Cpl Brown and Cpl Buell had not been associated with this snag since 7 Dec 76 and had not been tasked with de-snagging it because the aircraft was already turned over to another snag organization for repair.

The initiative and dedication displayed by these two NCO's resulted in the repair of an annoying snag which was extremely difficult to diagnose. Their professional approach, expertise and trade knowledge is to be commended.

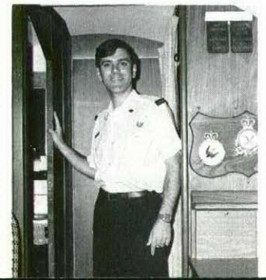
Had this condition not been detected many manhours might have been required to cure the problem and because of the intermittent nature of this snag, this condition could have persisted with potentially disastrous results.

Cpl W.W. Brown
Cpl K.L. Buell

MCpl J.R. Quinn



MCpl J.D. Melanson



MCPL J.R. QUINN

While installing project instrumentation on a Sea King Helicopter, Master Corporal Quinn noticed evidence of chafing on a hydraulic line. Closer inspection revealed that the line was almost worn through. The worn hydraulic line was the return line on the sonar reeling machine and if this line ruptured, complete utility hydraulic power would have been lost. The location of this chafing could also have caused a fire had the line worn through.

Although M/Cpl Quinn is a Communications Systems Tech, he recognized the hazard posed by this worn hydraulic line and ensured that the situation was rectified thereby making a positive contribution to flight safety. His professional attitude and devotion to duty are to be commended.

MCPL J.D. MELANSON

Master Corporal Melanson is an Air Transportation Instructor with 426(T) Training Squadron. On 21 April 1977 MCpl Melanson was the designated loadmaster on a Cosmopolitan aircraft on a scheduled domestic flight.

While completing the pre-takeoff check at CFB Moose Jaw, MCpl Melanson detected the presence of a dry, overheated water tank located in the rear washroom. If this condition had remained undetected, an in-flight fire could have resulted.

The discovery of this potential hazard is noteworthy in that a check of the area is not normally conducted during short enroute stops. In addition MCpl Melanson had held the CC109 "Operational" qualification for only four months, his primary aircraft being the CC130 Hercules.

Master Corporal Melanson demonstrated unusual care, interest and diligence.

CPL P.M. PETERSON

While performing a preflight inspection on a CC130 aircraft Corporal Peterson's attention was attracted to what appeared to be a flaw on the left rear main wheel rim. Examining the area carefully he thought he could detect a hairline crack. Reporting his suspicions to his supervisor, the wheel was removed and non destructive confirmed Cpl Peterson's diagnosis – an eight inch hairline crack was identified. Cpl Peterson's discovery of this defect is an excellent example of attention to detail, personal initiative and professional competence.

Cpl Peterson's thoroughness resulted in the elimination of a flight safety hazard that could have resulted in catastrophic wheel failure and serious damage to the aircraft.

CAPT K.C. HUMMEL MAJ J.M. ARNOLD

While carrying out a mutual training flight during a GCA approach, Major Arnold, captain, and Captain Hummel, first officer, discovered that the right main landing gear would not extend on their Tracker aircraft. Several selections were made with no results. The emergency gear lowering system was used but the gear remained up. Every attempt was made to extend the gear including high "G" manoeuvres, but to no avail. As a result, the decision to land wheels up was made.

All preparatory steps in the checklist were accomplished and the aircraft was then flown in for a smooth, wheels up landing. The aircraft was quickly evacuated and the fire department applied suppression foam to decrease the fire hazard.

Major Arnold and Captain Hummel are commended for their calm reaction to a serious inflight problem. Their timely request for advice from ground personnel to help solve the problem, and finally a very professional landing resulted in minimal airframe damage.

CPL A.B. HOUNSELL

While carrying out a primary inspection on Hercules 330, on 18 December 1976, Corporal Hounsell was releasing the brake pressure, and while he was depressing the co-pilot's left hand brake pedal he heard a scraping noise from under the floor. He also noted that the pilot's left hand brake pedal was not moving. He investigated further and found that the crossover cable between the co-pilot's and pilot's left hand brake pedal had come off the pulley. Had this not been detected it could have caused a brake to lock on, sometime during the next mission.

Functional checking of the brake system by releasing the pressure and depressing the pedals is not an item called for on the primary inspection. The fact that Cpl Hounsell went beyond his PI level, noted what at first appeared to be just minor scraping noise, took the initiative to investigate further by removing a pressure panel and getting assistance, clearly point to an exceptional job being done.

CPL J. NOLET

Cpl Nolet was on detachment to St John's Newfoundland in support of 880 Sqn operations. During the post flight inspection of a Tracker aircraft after a surveillance patrol, he discovered that the exhaust stacks of numbers two and three cylinders of the starboard engine appeared to be loose. A closer visual inspection revealed nothing out of the ordinary, however Cpl Nolet decided to investigate further. Upon removing the clamps by which the exhaust stacks are fixed to the cylinders, he discovered a crack approximately four inches in length in one of the manifolds. The aircraft was immediately grounded and appropriate repairs carried out.

Cpl Nolet's attention to detail in performing more than required for a post flight inspection and his perseverance and initiative after having discovered a peculiarity resulted in the identification of a very serious defect. His actions prevented a potential in flight emergency with associated risk to aircraft and aircrew.

PTE J.A. HOGAN

While performing an overstress check on a CF104 aircraft, Private Hogan detected an unusual odour. Further investigation (extraneous to that required on the overstress check) by him revealed the remains of a bird on the engine inlet guide vanes. There was no external indication that the aircraft had suffered a bird strike nor was the pilot aware of it. The subsequent inspections revealed no engine damage; however, Pte Hogan's alertness, initiative, and professionalism in the performance of his assignments, as shown on this occasion are worthy of service wide recognition.

MCPL R.W. ARMSTRONG

Following an unsuccessful attempt by Edmonton Centre to vector a lost and disoriented VFR pilot who was caught in IFR conditions to a safe landing at Edmonton Municipal Airport, Namao Tower was requested to assist. Namao weather was reported at 600 feet overcast and eight miles in light rain. An emergency was declared, crash trucks positioned and Master Corporal Armstrong, the GCA Controller, accepted control of the aircraft from Edmonton Centre.

Master Corporal Armstrong vectored the aircraft for a GCA approach to Runway 29, but had to break off the approach before the aircraft reached visual conditions. A second approach was set up for a long, straight-in approach with a rate of descent of 300 feet per minute. Despite some noticeable pilot apprehension, MCpl Armstrong's calm and confident instructions dispelled any tendency to panic and the pilot successfully set the aircraft down at the 7,000 foot marker approximately 16 minutes after the handover.

PO Faulkner WO Biggs PO Hobeck

MCpl R.W. Armstrong

Pte J.A. Hogan

Capt K.C. Hummel Maj J.M. Arnold

MCpl L. McLeod

Cpl A.B. Hounsell

The pilot was not IFR rated nor was the aircraft fully equipped for IFR operation.

Master Corporal Armstrong had successfully handled a similar emergency 10 days earlier when a pilot with less experience than the one in this incident had to be recovered in weather of 300 feet overcast and one mile in fog.

In both emergencies Master Corporal Armstrong's confident, composed and professional performance prevented a serious aircraft accident in which the loss of life would have been virtually certain. In this respect his effective action contributed significantly to Flight Safety in general and at the same time, reflected great credit on the Canadian Forces.

PO FAULKNER PO HOBECK WO BIGGS

During a normal three Sea King fly past practice at sea, Petty Officer Faulkner, a passenger in number two aircraft noticed what he thought to be unusual movements of the "beanie" on number three aircraft's rotor head. He immediately advised the co-pilot of the aircraft in which he was passenger, who in turn advised number three.

Simultaneously Warrant Officer Biggs on the flight deck and Petty Officer Hobeck on the flag deck of HMCS ALGONQUIN observed the same irregularity. They immediately took action to advise ship's controlling agency and air department personnel of their observations. This initiated the steps for emergency flying stations. Consequently the ship was closed up at flying stations and ready to recover the helicopter within record time.

Upon receiving radio warning from number two aircraft the crew of the third Sea King declared a PAN, carried out an emergency landing and shut down aboard ALGONQUIN. Elapsed time between PAN and shut down was less than three minutes.

High accident potential existed in the fact that the loose "beanie" could have caused de-icing wiring and hydraulic lines around the rotor head to break hence affecting the control system, or could have broken loose and struck the tail rotor.

Cpl J. Nolet

Cpl P.M. Peterson

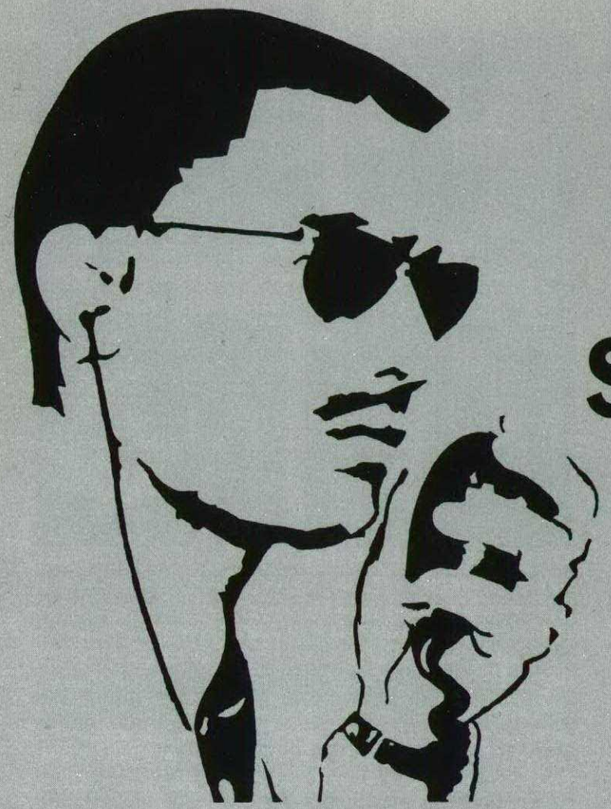
The professional and conscientious actions of these three individuals contributed to the expeditious and safe recovery of the aircraft. A possible serious accident was confined to a minor incident.

It is noteworthy that two of these personnel have jobs not associated with aircraft, and further emphasizes the fact that everyone can contribute to flight safety.

MCPL L. MCLEOD

Master Corporal, the Spectrometric Oil Analysis Program Monitor, received the laboratory results for a normal sample drawn from a T-58 engine installed in a CH124 Sea King. Results indicated an abnormal increase in wear metal content and the lab recommended that a sample be taken after the next flight. MCpl McLeod felt that more immediate action was required and, after consultation with the lab and servicing section, recalled the aircraft from a mission in progress, ordered a special SAO+ sample and restricted the aircraft from further flight. Results for this sample showed no adverse trends and, again, the lab recommended the return of the aircraft to service. Nevertheless, MCpl McLeod approached engine bay personnel for advice on possible sources of the wear metals in question and then chose to order an inspection of engine oil filters and magnetic plugs. Examination revealed microscopic chips, too large for detection by SAOP, and the engine was removed for investigation. Results confirmed incipient failure of Number one bearing which would eventually have ended with an in-flight engine failure.

Master Corporal McLeod's detective work was beyond the administrative nature of his job and averted a possible flight incident.



CONTROL, SUPERVISION and FLYING

No aircraft accident, however clear-cut the ultimate cause and blame, is due to a single failure or failing. Many interrelated factors form a chain which leads to the final event. But one factor that is almost always present is inadequate control or supervision of some aspect of the flight. Therefore, it will do no harm to remind ourselves of what we mean by "Control & Supervision of Flying" and of the responsibilities in this arena which authority carries.

WHAT IS IT?

What do we mean by the words "control and supervision?" By control we mean to direct and regulate. By supervision we mean to oversee, to watch over imaginatively and intelligently. The two are thus complimentary and are an essential part of the vocabulary of all who are engaged in flying. For not only must those in authority control and supervise their subordinates but we must all, individually, control and supervise, regulate and watch our own actions.

Let's look at this more closely. Supervision is the means by which we ensure that all those under our command carry out their duties correctly and efficiently; but we must supervise in such a manner as not to appear to interfere unduly; not to get so immersed in the detail of the task as to deny the proper responsibility of those who have delegated powers.

Everyone needs supervision–the pilot new to the squadron, the experienced operations officer, even the squadron commander and those above him. Some people are lucky enough to be able to supervise without much conscious effort, but the majority of us must work hard to acquire the skill. The degree of skill which an individual attains will depend to a large extent on the help and supervision he himself has received in the past.

Most aspects of our tasks are governed by orders, regulations, standard procedures and other instructions. We hope they are all clear and concise because orders and the like are there to be complied with for specific reasons, not because of arbitrary whims on the part of some supervisor. Some people in immediate authority seem to think that the mere existence of an order exonerates them from ensuring that it is complied with. These people are often heard to cry, generally after an accident, "we have a regulation against that and he (he being the unfortunate pilot or aircrew member) signed it and I have his initials to prove it." This is not leadership, nor is it proper control and supervision of flying.

Unless we are sure that an order has been carried out, how can we be sure that our subsequent actions are based on proper foundations? Some people think, too, that to comply with the letter of the law is sufficient. But there is more, much more, to it than that. Consider a simple training mission. First, the task is laid on, the participants selected and briefed, the flight plan is computed, the flight is authorized, flown, and finally the crew is debriefed. All of this is very straightforward, but all too often the task selected is the yet unfilled sequence on the training chart. The briefing makes liberal use of such glib phrases as "line-up and take-off will be standard. Any questions?" There being none, authorization consists simply of a signature on a clearance, and the debrief a casual check that the mission was accomplished and another signature on a hastily prepared grade slip for the flight records.

But, did the authorizing authority know the capabilities of the crews involved? The limitations? Was he aware of their strengths and weaknesses *before* the flight? Did he relate the task to the weather, satisfy himself that the crew fully understood the rules, check the flight plan and ensure–by a thorough debrief–that lessons were learned from all aspects of the flight? Such consideration of the factors involved in every flight is by no means automatic and many serious accidents testify to the fact that no small number of officers in positions of trust and responsibility did not consider these things.

HOW IS IT OBTAINED?

Often, investigations reveal that past failings have been condoned or followed by no more than gentle wrist slaps when it was obvious that more severe disciplinary action should have been taken. Each case, of course, is different and must be treated on its merits. The degree of remedial and corrective action required will, in general, depend on the seriousness of the failure. What good to detect a failure if nothing is done about it; it is pointless to make orders and then fail to enforce them. How often has a minimum altitude for, say, an aerial demonstration or flyby, been laid down only to be contemptuously ignored? Either severe disciplinary action should have followed the failure to comply with the order, or the order should have been changed–prior to the flight.

The authority to order a flight carries with it an absolute responsibility to supervise. The need for those who authorize flights to consider the flying experience, capabilities and qualifications of the aircrew can never be taken lightly. Whether the flight is to be advanced training by an exceptional pilot or a simple training exercise by an inexperienced student, the person ordering that flight must be certain that the task to be performed is not beyond the capability of the individual involved. If it is clear from the evidence of an accident investigation that an individual was being extended beyond his limits, how much sooner should this fact have been spotted–and remedied–by his supervisor?

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

WHO NEEDS IT?

An all encompassing answer might be "who doesn't?" That, however, is oversimplification. Inexperienced or below average pilots are not the only ones in need of supervision. Many accidents due to gross breaches of flying discipline such as low level "buzz jobs" or "shining the fanny" types involve pilots of acknowledged ability and skill who are occasionally in supervisory positions themselves. Information on the motives for this sort of behavior is limited because not many survive the accident. Nevertheless, the resulting investigation all too frequently turns up evidence which indicates a lack of essential supervision.

An oft repeated remark is to the effect that the pilot or crew concerned were normally beyond reproach and that their lapse was completely out of character and, therefore, inexplicable. Investigation, however, often presents an entirely different picture of the people involved, much more in keeping with the final result. Quite clearly the accident was not out of character at all. Those responsible for supervision and control simply did not know the real character of the people involved, or even worse, chose to ignore known failings.

Bad habits, long standing personal antagonism and past blatant disregard of orders and regulations all too often come to light only when it is too late. Pilots and crews are not Jekylls and Hydes who change their personality as soon as they step into an aircraft. They are quite normal human beings whose behavior is fairly predictable once their basic personality and character is recognized. To supervise effectively we must know those who work for us. The close contacts of our profession enable us to observe our subordinates much more closely than our civilian counterparts can and thus we have a better opportunity to understand their motives and actions.

WHY IS IT ESSENTIAL?

The United States Air Force needs men of character, of spirit and initiative. But we also need them to be skillfull, thoughtful and responsible. We cannot afford the brash young, or old, loner. There simply is no place for him. The young and inexperienced need the help, guidance and influence of the older and the more experienced. To check and restrain, to direct, guide and oversee demands that those in authority understand and know the men and women for whom they are responsible. This, simply put perhaps, is the solution to our problem. It is not an easy solution; indeed it is most difficult and is common to all supervisors at all levels of management and in all professions. But skill in it *must be acquired.* For unless we continually study our subordinates and strive always to know them better, we will not know their capabilities, their strengths and their weaknesses. And without this knowledge how can we hope to properly and responsibly "Control and Supervise Flying?" ★

courtesy Aerospace Safety

TALK ABOUT SHEAR!

The DC-10 at O'Hare Airport was waiting for takeoff clearance when tower advised the crew to expect some severe wind shear at 500 feet on climbout. Here's the captain's account of what happened:

"At 300 feet I began to increase my airspeed to 180 knots, 40 knots above V2, expecting turbulence and wind shear. As we went through 500 feet on climb, our airspeed dropped instantly to 135 knots – a 45-knots decrease in heavy turbulence. The nose was lowered to level flight and it was quite some time before we gained V_i, and even more time before we could climb.

"The point of this is that even though I was expecting a drop in airspeed I was shocked to see it drop so fast for so long. Had I been climbing at V2, plus ten knots in this condition, lowering the nose to level flight would not have been sufficient to keep from stalling, and there was not enough altitude to swap for airspeed. I have flown through wind shear many times but I have never seen so great a change over such a short vertical distance. I am sure glad that I was expecting it."

WHITE-OUT

and the human factor in helicopter operations

by Col R. W. Fassold

How does one cope with a low contrast situation? The first and best solution is to recognize the hazard and avoid the condition. If you do stumble on such conditions the only 'out' is to go on the dials immediately, climb to a safe altitude on instruments and then somehow get yourself to a place where VFR flight can be resumed safely, or go somewhere where you can do an instrument approach and landing. Since this obviously can be easier said than done, the best approach is one of avoidance. Helicopter pilots as a group are at significant risk of encountering this phenomenon because they routinely fly VFR at low altitudes, in relatively isolated areas, with little or no weather information and often with considerable urgency for mission-completion. They have the added disadvantage of often being poorly qualified or current in instrument flying and may be in an aircraft marginally equipped for instrument flight. If a sudden encounter with the low contrast phenomenon results in spatial disorientation, the helicopter pilot is faced with one of the most hazardous situations to be encountered in flying, i.e. immediate and successful transition from VFR to IFR in a critical phase of flight – in this case close to the ground. A 180-degree turn is *not* the answer – except perhaps a permanent one. Even if he successfully transitions to IFR, his worries are far from over. He has to recover somewhere and probably with little or no assistance. The message obviously is – know the conditions that can produce the low contrast phenomenon, know how dangerous this can be and avoid the situation with the same determination as the wise pilot applies to avoiding a thunderstorm.

Since due to operational necessity or plain bad luck, avoidance may not be possible, helicopter pilots should be trained always to have an escape plan whenever flying where there is a risk of encountering these conditions. For example, a mental conversation like this might save your life: "if I lose depth perception I'll climb to 1,000 feet, turn 90 degrees right and I should be visual again within 5 miles; if not, I have the – beacon tuned in and I'll climb another 1,000 feet and home in on it. If I'm not visual at the beacon I can do an approach there". In other words, the same principle the single-engine-aircraft pilot applies, or should apply, to always having an emergency landing plan for use if the engine quits. Note that the same type of emergency action plan is applicable to both the low contrast situation or to a sudden encounter with instrument flight conditions at low level due to low cloud or fog.

We can now address the first point briefly. The position that human factors are not involved in any accident where the low contrast phenomenon has been a contributing cause can surely not be supported. Any aircraft will fly perfectly well in the low contrast situation. It is the human component that fails. If there is an accident under these conditions, then it is pilot-caused and, therefore, there is human factor involvement. The human factor concept is often misapplied. Does one need physiological or psychological impairment of a pilot to identify human factor involvement? It is suggested that there is human factor involvement whenever the situation to be coped with exceeds the design specifications of the fully-fit and normal human, functioning at a maximum level. These considerations are very important in helicopter operations because the fact is, that many helicopter operations are routinely conducted at, or outside of human design limitations – and, within the state of the art, satisfactory utilization of helicopters cannot be realized otherwise. Helicopter pilots should never be intimidated by their jet-jock colleagues. It's official now; 60K a few feet off the ground or with rotor tips brushing the trees is 'high performance flying'!

Recently we had a tragic helicopter accident when a pilot of a Kiowa (OH 58) attempted a classic 180 degree turn at very low level under 'whiteout' conditions. Part way into the turn, the aircraft struck the surface, was demolished and all three occupants died. The accident investigation revealed two things worthy of our consideration. First, the investigating flight surgeon concluded that human factors were *not* involved in the accident; and second, it appeared from aircrew statements that many helicopter pilots had an incomplete understanding of the 'whiteout' phenomenon.

The second point will be considered first. This accident *did* occur in what might be described as a classic whiteout condition – i.e. in poor light, over a frozen snow-covered lake, in blowing snow. For those fortunate southerners who may not be familiar with this condition, a brief description may be in order. Picture a flat snow covered surface with the level of illumination too low to provide contrast at any surface relief that may exist; there is no visible horizon due to falling or blowing snow. Note that neither the ceiling nor the visibility need to be particularly low i.e., the conditions can be VMC (visual meteorological conditions) which usually means a ceiling of 1,000 feet or higher and a visibility of 3 miles or better. The light level however, must be relatively low, the surface must have little contrast or relief and the horizon must be obscured. Under these conditions the pilot loses all useful visual cues and, therefore, depth perception. He is unable to continue to fly safely by visual reference to the environment – i.e. he is 'whited-out'.

Our pilots are generally quite well-versed on many of the problems associated with visual flight over, or in, snow. They usually recognize the classic whiteout situation just described, although the degree of human incapacitation which can ensue may not be fully appreciated. There is, however, a tendency to believe the visibility must be very poor. What is often not understood then, is that for 'whiteout' one needs neither severe visibility restriction nor *white* (i.e. snow on the ground and falling or blowing snow). All one needs is no, or low contrast, and no visible horizon. The problem is not one of obstruction of vision, but rather that there is nothing useful for the eye to see. The implications of the term 'whiteout' therefore, can be dangerously misleading. A more correct term is *low contrast phenomenon* – this better removes the implication that snow and a severe visibility limitation are required.

To recap, a pilot may find himself in a hazardous low contrast situation when the level of illumination is low, such as may occur in the early morning, late evening, on a dull cloudy day or in darkness; there is no visible horizon as can easily occur in haze, fog, smoke, smog, precipitation or in darkness (even with a good measured visibility); and, he is flying low over any flat surface with little or no contrast or relief that can be interpreted correctly. 'White' is not a prerequisite. A large, dark, ploughed field will do nicely, as will water, desert sand, or even a uniform field of grain if the conditions are just right. Actually, one theoretically can suffer 'whiteout', 'brownout', 'yellowout', 'greenout' or whatever. The result, *if* one tries to continue flying by visual reference to the environment, can be a severe case of recognized or unrecognized spatial disorientation. The potential seriousness of this condition can hardly be overstated, but almost needs to be experienced to be appreciated. Flying under the low contrast phenomenon can be extremely dangerous whenever one is maintaining terrain and obstacle clearance visually, including during landings or take-offs. An additional little hooker for helicopter pilots is that an absence of visible horizon is not always a requirement. If one is low enough, i.e. a few feet above a wide expanse of flat terrain, and concentrating on terrain clearance, there may be no horizon available for reference in *the visual field of gaze* – even though there is a clear horizon.

Speaking of Endorsements

"I have had quite a bit of heartburn in the past 3 or 4 months with some of our accident reports and CO's endorsements. An accident report should state the facts – what happened, why, and what should be done to prevent the same thing from happening in the future. An accident report is not a fitness report to tell how great the pilot performs or what a great asset he is to the local community; it is not a medium for promoting philosophy; it is not a time to practice your prose. Sit down and read all the accident reports from our command this year. The voodoo, black magic and (censored) contained therein is enough to make one barf. Please review the instructions, and don't release any more messages telling the world what a great guy it was that just busted your airplane. Save that for his going-away party or his fitness report – that's where he will need it."

Weekly Summary

COMMUNICATIONS

by Capt D. A. Cushman

I have not written a letter to a military publication for years . . . . in fact, this letter may convince some people that I haven't written a letter in years. However, that is perhaps my small contribution towards what I consider a problem in military flying, and in particular flight safety: communication.

You probably may agree that a lack of communication in Canadian flight safety exists. Flight Comment consistently substantiates this. How many times have I anxiously awaited the next issue only to find it full of articles which I have already read (or glanced at) in the MAC Flyer, Interceptor, Approach, Aerospace Safety, Air Clues; very little Canadian content indeed. With some issues the CRTC could have a field day. I then turn to the editorial page and, not surprisingly, read a pleading (and justified) request from anyone to send in articles. At least you have spared us the heart wrenching photo of the editor on his knees imploring donations from the readers (with tear in eye).

I feel the flight safety communication network has not developed a gap, but rather has become a tad one-sided. Certainly there is no lack of publications dealing with the subject; we are deluged with a mountain of flight safety bulletins and posters, most of them applicable. It appears obvious that you are not, however, receiving enough communication in the opposite direction. Why doesn't Flight Comment receive more articles? . . . . . .

When was the last time your flying unit was involved in a real, honest-to-goodness, all-out bull session related to flight safety? I don't mean an organized briefing by a flight safety officer; I mean a group of aircrew sitting around jawwing about flying. Most guys have to think about the last time they did that.

After I had received my wings, and was still a trembling "pipeliner" (always hated that word 'til I wasn't one), I remember many gab sessions, and much encouragement (from the older types) to get in and participate. I remember one grizzled, extension flight lieutenant who sagely mumbled to the new arrivals – through creased, wrinkled lips, looking at us through creased, wrinkled eyes (how he could maintain a cross-check at that age was a mystery . . . he must have been at least 45) – "It doesn't matter how stupid or dumb or smart you think a comment or question may be . . . say it. Because if you don't, you may never know how stupid or dumb or intelligent it was. That means talk, listen, and learn from other's experiences."

Now how the devil can I learn from other's experiences if no one is willing to talk about them?

I remember an excellent continuing series in Flight Comment taken directly from the BFSO's file – it used to be called "Safety Comment" and had Three boxes that said "CLOSE CALL, OPERATIONAL HAZARD, SAFETY SUGGESTION". The articles were terrific; if nothing else they *created* bull sessions in the crew room; they always had a message, and they were written and submitted by the line aircrew. Most of us used to sit around and discuss how someone could get into a jam like that. The series of articles would make excellent bar stories if they happened to you – I think one reason they were put in the magazine was to help prevent you from having a similar experience.

One reason that series has disappeared is a lack of contributions . . . but why? No one is going to convince me there are less incidents – one look at a monthly MAID can explain my reasoning, but we rarely find a follow-up to explain how a piece of defective machinery got back on the ground.

What has encouraged our system to become closed-mouth? Could it be . . . ?

A Base Commander sits down and "reems out" a number of supervisors who admitted to foul-ups prior to an accident. He then states in a Base newspaper that flying accidents must cease. Now is that promoting flight safety? How many members of that unit do you think will sit down and write about an incident that occurs when they may have "goofed up"? What we now have are incidents occuring and no-one talking about them. Whose fault is that? The chaps having the incidents not being responsible enough to talk about them?

How many times have you heard someone say "I'm sure glad the CO didn't get wind of that"? Was it you? Your buddies? Your flight commander? Didn't get wind of what?

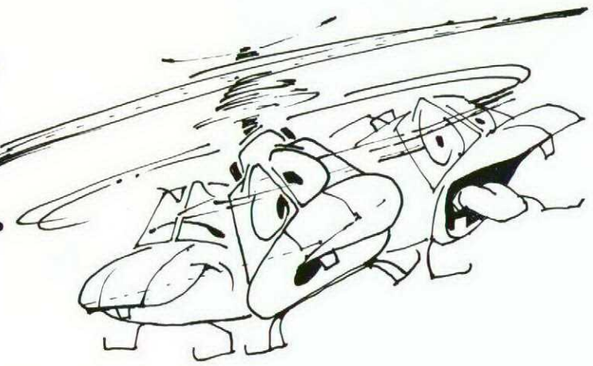
Can you recall a supervisor who was getting upset with you because everytime you went away *you* ended up U/S? The wording here is significant, I thought it was the *airplane* or the *weather* that went U/S. On your next trip will you be less thorough on your walkaround? After all, if you don't get home on time, there may not be another time . . . . .

Fear of reprisal may be a primary factor in reluctance to report a "learning" experience. Don't give me that "anonymous" protection stuff – a story is based on facts, and nine out of ten people know the facts. If a supervisor wants to know badly enough who wrote the article, he'll find out. What worries me is there may be supervisors who would *want* to find out.

After re-reading this, and thinking about practicing what I preach, I may be able to muster enough courage to send you some articles to re-instate the series (committed by friends, of course, who shall remain nameless).

If we don't talk about incidents involved with flying, are we really being honest with each other? I think not . . . in fact, we are being downright dishonest. With over a third of my life involved with flying, I have found that when someone becomes dishonest about flying, we usually end up with a hold in the ground.

As for flight safety, flight safety articles, and Flight Comment contributions, that's your problem . . . . . isn't it? . . .

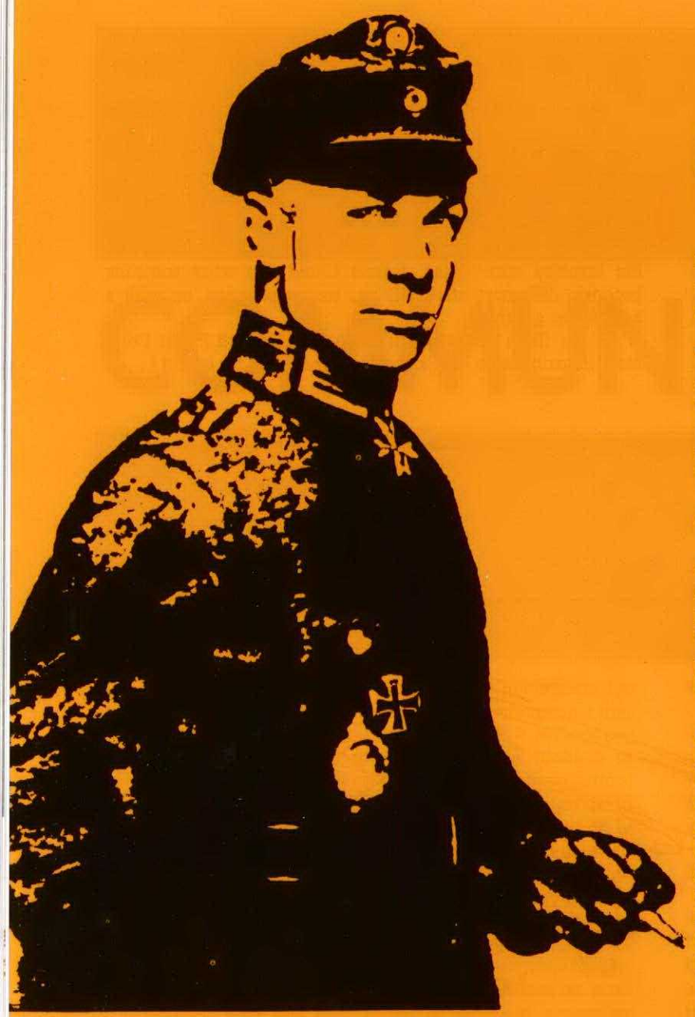


SCREWY HUEY

The Huey was maintaining 500 feet AGL when the crew heard a grinding sound coming from the engine compartment. The pilot wisely decided to make an immediate precautionary landing in a plowed field. No problem on the approach, but as the UH-IN neared the ground things began to happen. At about five feet, the pilot increased collective and lost tail rotor control. The aircraft continued to descend, turning about 180 degrees before touchdown. On touchdown, the pilot shut down the engines. Passengers and aircrew were uninjured.

Investigators found that the transmission output quill to the tail rotor had failed. Rapid reaction by the crew in opting for a precautionary landing probably prevented injury to its occupants.

courtesy of The Mac Flyer



HUMAN FACTORS IN WAR

PART IV

specially for Flight Comment

By Robert Rickerd
(c) Airdigest 1977

The famous "Pour le Merite" or "Blue Max" was the highest honour for individual gallantry in action awarded to the German military in the 1914-18 war. Ernst Udet was one of the many recipients.

In contrast, from 1936 to 1941 as head of the Luftwaffe Technical Office Udet probably qualified for most of the Allied awards when he so fouled up the German aero industry that it never fully recovered. He could have become one of the most powerful men in Germany had he been the right man for the job, but instead, as the classical misfit often does, Udet ended up taking his own life in despair.

But his lack of administrative ability in WWII could not detract from an earlier more colorful career.

Ernst Udet began the first War as a motorcyclist and like many others who tired of conditions on the ground, transferred to the Air Service, first to two-seaters where he won the Iron Cross Second Class and then to fighters. On receipt of Udet's transfer orders his Captain is supposed to have commented wryly, that the young pilot had "more luck than brains".

Udet certainly had luck. On his first encounter with the enemy he "froze" and a French bullet shattered his goggles. He was to have several more close shaves before the Armstice. By 1917, he was a Second Lieutenant, an ace, and leader of his own Jagdstaffel. Soon he was the only survivor of the original group as the air war increased in tempo. Once, he met the great French ace Guynemer, and after a long duel Udet's guns jammed. Guynemer, who died with 53 German planes to his credit, saluted him, and on a chivalrous impulse allowed him to escape. Had he known that Udet's score would eventually extend to 62 of his comrades, Guynemer might not have been so kind.

After the war, Udet turned to stunt flying, and between 1921 and 1926 loaned his name to the manufacture of light aircraft, which he flew himself in air shows first in Germany and later in Austria, Switzerland, and England. He became an actor of sorts, flying his "Flamingo" in several films. The "Flamingo" was to become one of the first training aircraft for the new Luftwaffe, and Udet's aircraft company, reformed as the Bayerscke Flugzeugwerke was eventually absorbed by Willi Messerschmitt.

In September 1931, Udet performed at the National Air Races in Cleveland, Ohio. He returned to the U.S.A. in 1933 and in Buffalo, New York, saw something which was to make an indelible impression on his mind – the Curtiss "Hawk" dive bomber which had been designed for the U.S. Navy.

In the spring of 1922, Udet had met General Billy Mitchell who was on a tour of European air bases and plane factories. Mitchell, who was later to be court martialled for his public pronouncements in an effort to prepare his country for modern warfare, was fresh from his triumph in America where he had proved that large warships could be sunk by bombs from the air. This great apostle of airpower impressed Udet immensely with his arguments on the future of the bomber airplane in military actions. Mitchell's arsenal of ideas included the dive bomber, which in a time when level flight bomb sights were still primitive, seemed to offer the most accuracy to a pilot attacking a ship or other small target. The idea appealed all the more to Udet because this was the very tactic he had used to run up his impressive score in the War. The only difference was that he had carried guns instead of bombs.

So it was that after he saw and flew the "Hawk" in Buffalo in 1933 Udet prevailed upon his wartime comrade Hermann Goering, who had recently become the German Reich Commissioner for Aviation, to purchase two examples for testing by the clandestine Luftwaffe in Germany.

Udet demonstrated the "Hawk" to German officials and the Rechlin Experimental Centre tested them exhaustively. Then in the summer of 1934, Udet's luck was called upon again when the tail unit of the "Hawk" he was diving parted under the pressure of his pullout. But Udet had already coerced the Technical Office to draw up a two-phase specification for a German dive bomber, and in 1935 two prototypes were flown.

The Henschel and Sohn concern, manufacturers of locomotives and heavy road vehicles produced the winning design, and it was not surprising that when the plane made its first public appearance in May 1935, Ernst Udet was at the controls. It was also not surprising that the Henschel 123 as it was called, looked very much like a cleaned up Curtiss Hawk biplane! After some structural problems caused by the 5g pullouts were remedied, the new dive bomber went into production seeing service with the "Condor Legion" in Spain and later in WWII.

But the biplane configuration was rapidly being replaced by the monoplane at that stage of aircraft development and the dive bomber was no exception. Udet was already concerned with the second generation of his favorite toy in 1936. Three companies were invited to submit designs, but the competition was loaded against two of them because the specification was written around the Junkers 87, design work on which had begun two years earlier. One would suspect some collusion between Udet and Junkers here, were it not for later developments.

In March 1936 the contenders for the dive bomber production contract were delivered to the Rechlin Experimental Centre. By this time the competition had swelled to four. After months of testing, it was obvious that the Junkers and Heinkel prototypes were the front runners.

The Junkers 87 had been demonstrated to advantage by the Junkers test pilot, but the Heinkel 118 had not been fully "sold" by its pilot in Udet's eyes. Later he took over the Heinkel dive bombing tests himself, mishandled the propellor pitch mechanism and had to call on his luck and his parachute. The Heinkel 118 was destroyed in the crash and once again Udet's heavy hand had influenced the fate of the dive bomber.

However, not everyone was stricken with Udet's "Stuka Madness". Wolfram von Richthofen, a cousin of the famous "Red Baron" of WW I fame, and Chief of the Technical Office development Section issued a directive on June 9th 1936 to stop development of the Junkers 87. Unfortunately, Udet took charge of the Technical Office a day later and the aircraft was put into production! Over 5,000 Stukas were produced to the end of the War. It was a success until it first encountered modern fighters during the Battle of Britain. After that it was a disaster.

Udet continued to spread his influence over German aircraft designers. The next type to fall prey to his "madness" was the Junkers 88 which had attained 323 miles per hour in 1937. Now it must be capable of dive bombing as well! Originally envisaged as a six-ton fast bomber depending on its speed to evade enemy fighters this and other revisions to the basic design eventually raised its weight to twelve tons and it was a fast bomber no longer. The Dornier 217 had to have a dive bombing variant as well but the peak of Udet's Stuka Madness was reached with the Heinkel 177.

In 1936, Germany had two heavy bomber prototypes flying and would have been two or three years ahead of the Allies in this department. But upon the death in June of General Wever who had been their champion, Udet and his assistant Jeschonnek, together with Kesselring who was Wever's successor shifted emphasis from these aircraft and eventually convinced Goering to scrap them altogether. Goering had no trouble digesting the argument that he could have twice as many JU88's as heavy bombers for the same amount of aluminum and labour.

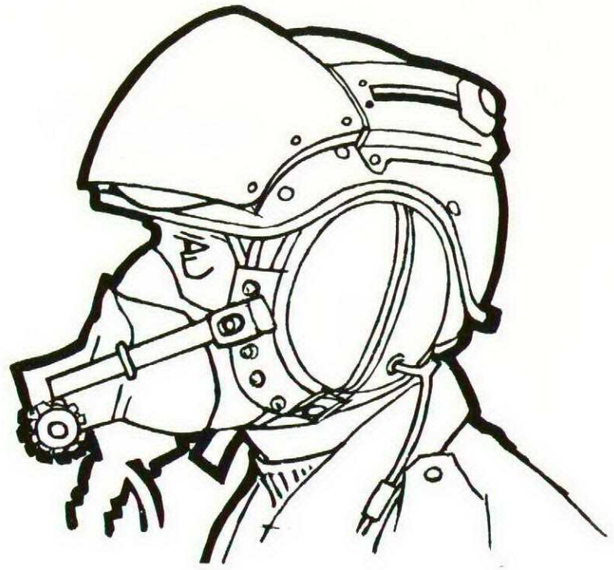
But in 1938, Udet decided that Germany did need a long range heavy bomber after all, one that could dive bomb! Heinkel was asked to develop the plane which was to surpass the performance of any bomber in the world, with a range of 4,160 miles and a speed of 335 miles per hour. The Heinkel 177, "Griffon" as it was called was originally designed to dive at 30 degrees. To reduce drag and improve this manoeuverability its four engines were coupled in pairs in two housings driving two propellors. This feature alone led to a host of problems – overheating, which lead to in-flight fires, propellor shaft and pitch control failure and poor serviceability among them. The airframe itself suffered many failures and needed to be strengthened due to the stresses imposed on it, but the Technical Office not only maintained its original requirement for dive capability but increased the required angle to 60 degrees!

By September 1942, when Goering stepped in and lifted the requirement, there was not time for the "Griffon" to become available in large enough numbers to make a difference in the outcome of the War.

Ernst Udet committed suicide in November 1941. His luck had run out at last and the consequences of his shortcomings as an administrator were too much for him. In addition to "Stuka Madness" he had shown an unfailing talent for picking unreliable subordinates and an inability to recognize, perhaps even acknowledge problems when they arose. He had surrounded himself with over 4,000 military, bureaucrats and engineers in 26 departments. Goering said "never have I been so deceived as by that office. It has no equal in history. He has destroyed the German air force." An enquiry into Udet's conduct after his death concluded that he had indeed failed to provide leadership and had neglected his duties.

But perhaps blame for Udet's failure would be more justly worn by Goering himself. He had picked the happy-go-lucky stunt flyer for the most important job in the Luftwaffe.

Fitting Your Helmet



By Capt. John A. Winship

"Your helmet hasn't changed very much over the past 15 years; but then again, neither has your head!" Gathering from the inspection of a number of helmets from recent accidents, it appears that attitudes toward use of the helmet haven't changed much either. Of the 20 most recent helmets inspected, 35% of them (that's 7 out of 20) showed signs of poor fitting. How can we tell, and what are we trying to do about it?

THE CFTO DEFINITION

The brand new CFTO on aircrew helmets states "the helmet is designed, *when properly fitted*, to be retained during high speed bailouts. It provides vision and facial protection, sound attenuation and protection for the wearer's head during in-flight buffeting, ejections, manual bailouts and crash landings. The design distributes the impact forces over the entire head via the webbing outer shell suspension system . . .".

The CFTO goes on to say . . . "Personnel to whom helmets are issued are responsible for their general care and security for preuse inspection, testing and visor cleaning . . ." and on fitting . . . "The flying helmet must be individually fitted to the crewman by a Safety Systems Technician. Crewmen are cautioned not to make adjustments themselves. To provide maximum protection, comfort and sound attenuation, a good fitting shall consist of a snug fit at the cheeks, forehead and nape of the neck . . ."

"THE RULE OF THUMB"

We have come to recognize at DCIEM that there is really no such thing as a standard head. Some are long and narrow, some are wide at the top, and some are quite fat. But a range of sizes of helmets has been provided from which pretty well any head can be fitted. This, however, takes care and patience, and "The Rule of Thumb".

When a helmet is fitted properly, it should not move around on the wearer's head when he puts his hands on top of the helmet and tries to move it. The Rule of Thumb comes into play: the suspension straps should now be adjusted so that if you press with the thumb on the point where the suspension cross straps intersect, you should be barely able to make contact with the inside of the shell. This ensures that the suspension straps are able to do their job of load distribution. (i.e. you're not wearing a contact helmet).

Rather than say more here, I would suggest to all that you take the time to read the new CFTO. The headache gained from the reading may be better than the headache from a poorly fitting helmet. I would state strongly however, that if you can recognize the symptoms of a poorly fitted helmet, this doesn't mean you can fit one. Read on, and I deal more with that subject below.

DCIEM AND HELMETS

DCIEM is actively involved in the fitting of your helmet. The basic design came from here almost twenty years ago. The number one requirement stated at that time for the helmet was comfort. That hasn't changed. When we look over the changes in the helmet since that time, we find an improved cover for the visors, new push-button visor knobs and improved fitting and retention features of the inner helmet. The most recent user trial on the helmet has been the trial of a turn button assembly for the single visor kit. In response to criticisms of the push button, an option is being offered. The user trial of a new inner helmet with exposed, contoured earcups is just being completed. In recognition of the fact that very few heads have perfectly flat sides, a contoured earcup with more lateral flexibility in its moorings is being tried. Already problems have been detected with the new system and a further set of modifications should overcome these.

An interesting point here is that it turned out to be worth taking the time for a user trial. It had seemed that the new mods to the helmet would be acceptable with no problems. Only through user trials did we find that we had introduced too much fore/aft flexibility between the inner and outer helmet. So now we've overcome this and a further user trial (hopefully a shorter time period) should confirm our work so we can get the improvements into the system.

VISOR PROBLEMS

On the subject of visors, there have been some problems identified. Probably the most notable is visor length, particularly in helicopters. The solution is not so simple as just lengthening the visor. In fact, it was originally *shortened* to solve the problem of overhang in the fully retracted position. In the process of user trial of the new turn button, however, we may have found the solution. To install the trial turn button, the corrugated metal track on the inside of the visor cover must be removed. This permits an extension of the slot in which the visor button slides, thus allowing the visor to be lowered farther. If this mod causes the visor to chop your nose, the next step is to carefully extend the contoured slot in the visor itself to accommodate the visor being lower. A mod leaflet is planned, based on the results of the visor button user trials.

SPECIAL FITTINGS

Did you know that if your helmet can't be fitted properly, you have won a trip to Toronto? The CFTO states that when all else fails to achieve a proper fitting, you can arrange a special fitting at DCIEM! We always remind aircrew we see on special fittings (about 25 per year) that if we didn't solve their problems, let us know. With the positive feedback and lack of negative feedback we get, we can only assume we've helped in some fittings. So if you have problems, we may be able to help you.

THE HELMET FITTING WORKSHOP

After some years of suggesting and recommending, last year MCpl Jerry Green finally proved his point by running a "helmet fitting workshop" at DCIEM. Running it for privates and corporals (the guys who do the work in fitting helmets) he demonstrated that the techs require and are eager for the opportunity to upgrade their skills. The point was made so well that there is now a draft Course Training Standard to cover the Trade Specialty Specification 531.40 (Special Fitting – Flying Helmet Assembly) for Safety Systems technicians. In a week-long course to be held at DCIEM, technicians will learn the design and use characteristics of the helmet, its protective features and basic special fitting techniques. Where it may formerly have been less prestigious, it has now become a specialty to be able to properly fit and maintain aircrew helmets.

SO WHAT ELSE IS NEW?

Considering the fact that no individual is full-time on only helmets at DCIEM, we feel we've done not too badly. But we also recognize that there's lots to be done. We're in the process of preparing a performance specification for aircrew helmets, to set basic criteria of performance along with evaluation procedures. Looking forward to new technology supporting a new fleet of NFA, we're already busy attempting to have a helmet system designed as an integrated component of the overall Life Support Package.

There will, no doubt, continue to be problems with our helmets, but we do have a good system now. It does its job well, as borne out by its performance in CF accidents – many sore heads and worse have been prevented. It remains, however, up to you to ensure that your helmet performs to the limits of its design capabilities by having it fitted properly.

THE STATISTICS AT THE BEGINNING

Of 20 helmets inspected (eleven 41-2's; nine 411's), 6 had diagonal webbing suspension straps too loose, and one had a nape strap too loose. These figures tell us something about fitting, something about attitudes and something about how the helmet will perform if pushed to its limits. We're trying to make improvements to the helmet, but in the meantime there's room for improved use of what we currently have.

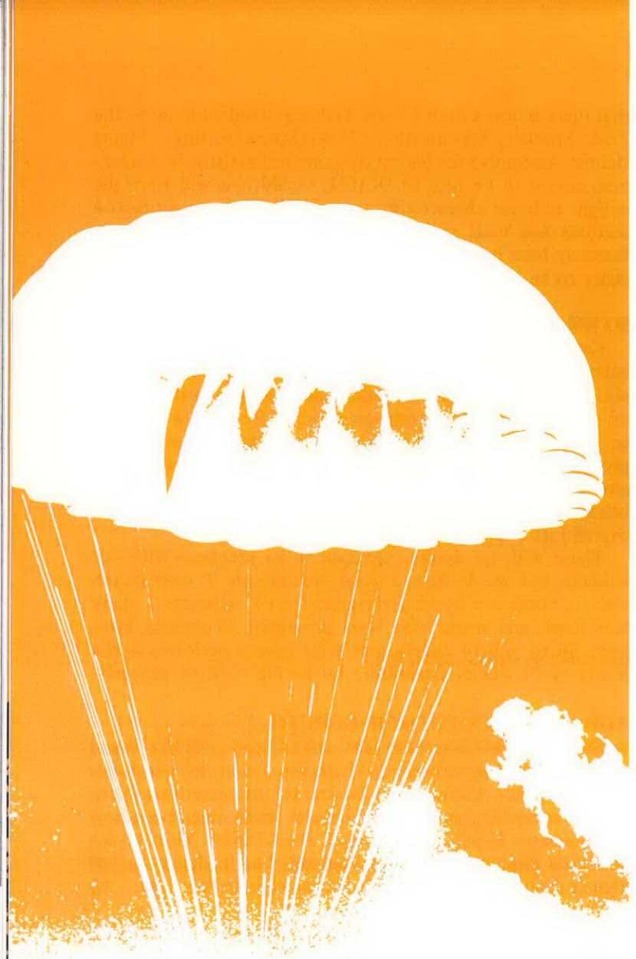
LOOK, MA, NO AILERONS

Things were going smoothly as the twin-turboprop Navy aircraft cruised at FL 180. Smoothly, that is, until the pilot made a small aileron input with the yoke—and got no response. The yoke flopped freely from side to side with no restriction, and with no movement of the ailerons.

Luckily, the aileron trim still worked, and the pilot found that he was able to maintain wings level through judicious trim inputs. As he walked this delicate aerial tightrope, other crew members removed the access panel covering the aileron control installation.

Once the panel was off, the crew discovered that the nut, bolt, washer, and cotter pin which were supposed to hold the aileron torque tube to the bellcrank were conspicuously absent. At the pilot's direction, a crew member held the aircraft wings level by physically manipulating the torque tube while others went in search of something to hold the aileron control system together.

Eventually, one crew member found a bolt of approximately the right size in the aft compartment. In a sterling display of crew coordination, the pilot moved the yoke as directed by the crew member controlling the ailerons until the bolt holes in the bellcrank and torque tube were lined up. The substitute bolt was quickly inserted. The crew then heaved a large sigh of relief and settled down to the task of watching the jury-rigged controls until an uneventful landing at destination.



Parachute Jump

In January 1942, I was the senior aircraft maintenance technician in "B" flight of 115 Fighter Squadron. At this time our squadron had been based at Patricia Bay on Vancouver Island for approximately four months. During the preceding two months most of the air and ground crew were busy on ferry work. Our Mark I Bolingbroke aircraft had been ferried to bombing and gunnery schools in eastern Canada and we had returned with new aircraft. One of the old aircraft remained with use because it required spare parts during the ferry operation.

Now, on the afternoon of 31 January 1942, this old Mark I Bolingbroke aircraft had been declared serviceable for test-flight by central maintenance. A pilot and myself as flight engineer were assigned to carry out the test-flight. After all pre-flight checks and engine run-ups had been successfully completed we taxied out for take-off. It was a beautiful, sunny afternoon and we anticipated a pleasant flight for half an hour or so. Take-off was routine but a bit too noisy for comfort since the aircraft still lacked the cockpit canopy. The lack of a canopy had little or no effect on the flying characteristics only crew comfort, so it was quite permissible to fly the aeroplane. But the missing canopy was to play its part in my little drama before long.

After take-off over Cowichan Bay we turned east to pick up the strait and then headed up the island towards Nanaimo. For the first fifteen or twenty minutes everything went well and then things began to change rapidly. Gauges that had been reading OK began to indicate trouble on the port engine. The oil pressure began to drop and the temperature to rise. Next I noticed a small oil slick on the bottom of the cowling, a sure indication of an oil leak. Time to turn for home and we banked swiftly and were on our way. But before the pilot had time to shut-down the engine we had a fire. We completed the shut-down, feathered the propeller and used the fire extinguisher in quick succession. Slowly the flames died and we breathed a sigh of relief. Now, just a short run home on one engine.

To reach base quicker and have a straight-in approach at the last it was decided to turn right before reaching a high promontory. Then all that would remain would be a careful turn to the left and a straight run down Cowichan Bay to the runway. Just prior to the point at which the pilot would make a left turn he requested that I hook up his parachute harness and I did so. He was using the seat pack type and the harness had been draped over the back of the seat ever since take-off.

I had a chest pack type and wore the harness all the way but the pack itself was stowed on a shelf behind our cockpit compartment. At this point in time I decided to retrieve my own pack and being short in stature I had to step up on the co-pilots' seat. As I unfastened the strap holding my pack I felt a bit unbalanced and glanced over my shoulder to see what was wrong. Sure enough! In executing the left turn the left wing had unintentionally been allowed to drop some. With the dead engine on this side and all the power on the right engine the aeroplane was quickly swinging into a diving turn to port. I could see the pilot trying to bring the left wing up level but without success. The aeroplane was rapidly losing height and a quick look at the altimeter showed the needle going past the five hundred foot level. No time to lose!

I've been told that in crucial moments such as this where the factors are few but obvious, the human brain will decide faster than a computer. In rapid sequence I stepped down off the seat, snapped on my pack, slapped the pilot on his shoulder, pointed over the side and hollered "let's go". Then I stepped up on the seat again and actually dove over the port side. Fortunately for me the aircraft was in an ideal attitude. But best of all, I had no canopy to open. I firmly believe that this time saved gave my parachute just enough time to open and so save my life.

I already knew in my mind that it would be a very close fit. As soon as I felt the initial chuck of the opened chute I looked down to see what was underneath, land or water. I had a bit of a shock to see neither but instead an all metal aircraft. It had already crashed into the mud flats directly below me. I wondered if I would swing wide enough to miss it since I had no time to juggle the shroud lines. As it turned out I had to bend my knees, pull up my legs and just barely missed the wing tip. Ah' beautiful mud.

After the initial chuck that a falling body receives when employing a parachute, a swing or oscillation begins towards one side or the other and then to the opposite side and back to the starting point. That is a complete oscillation and will be repeated as time or height allows. I felt the chuck, swung to one side, then to the other side and into the mud. Approximately three quarters of one oscillation. I leave it to some one else to figure out the height at which the chute opened. For me it opened in time and saved my life.

M.E. WHYTE

Public Archives Canada | **Archives publiques Canada**

Records Management | **Gestion des documents**

April 8, 1976

Mr. Malcolm E. Whyte
2997 Linton Road
Ottawa, Ontario
K1V 8H1

Dear Sir:

With reference to your letter of March 15, this is to confirm that according to records held in our custody, while serving with 115 (F) Squadron based at Patricia Bay, B.C., you were aboard a Bolingbroke Mark I aircraft which crashed near the head of Cowichan Bay, B.C. on January 31, 1942. Evidence indicates that you made a life-saving parachute jump from an altitude less than 500 feet and it was reported that your parachute opened at approximately 150 feet. The pilot was killed on impact of the aircraft.

Respectfully

(Miss) J. Dignard
Head
Canadian Forces Records Centre

Headquarters Records Centres Division
Ottawa, Ontario
K1A 0N3

IRVIN INDUSTRIES INC.

CORPORATE HEADQUARTERS

September 23, 1976

Mr. Malcolm E. Whyte,
2997 Linton Road,
Ottawa, Ontario
K1V 8H1

Subject: Caterpillar Club Membership
Your letter dated April 8, 2976 refers

Dear Sir:–

We have received a letter from the office of Public Archives Canada – relating to your Parachute Jump of January 1942. Also your account of the subject plane incident, and may we add our congratulations on this successful emergency parachute jump! It is more than gratifying to know that parachutes have consistently served their purpose and proved their worth.

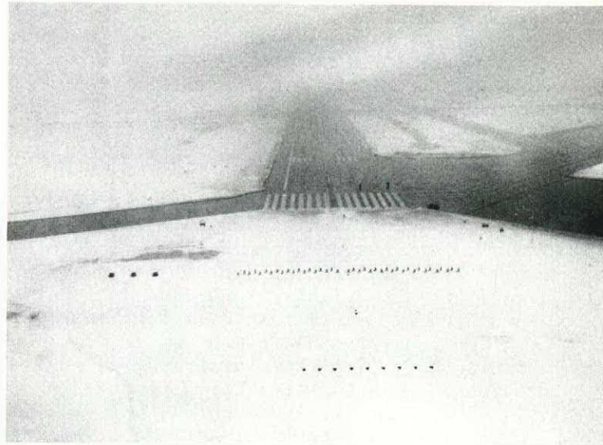
Your emergency exit at that time, of course, entitles you to membership in the IRVIN Caterpillar Club, which is composed solely of those whose lives have been saved by means of parachutes in escaping from disabled aircraft.

We are pleased, therefore, to make this presentation – and enclosed find your Membership Card and gold Caterpillar Pin, together with our sincere congratulations.

Very truly yours,

IRVIN INDUSTRIES CANADA LIMITED

Clifford Bonn
Vice President/Aerospace



VOODOO PRANG AT COMOX

It wasn't long after man invented runways until he invented what we have come to refer to as the "short landing" – in fact, while historical data is not available we would be willing to bet that the two inventions were almost simultaneous.

In the old days of course, the aftereffects were not always critical. In many cases the runway was just a frill anyway – the aircraft of the day being generally quite capable of grass field operation. Sometimes however, the approach to premature touchdown presented its own hazards in the form of telephone or powerlines, fences, and even herds of animals grazing on the perimeter grass.

Recently one of our Voodoos touched down short. It might have been capable of grass field operation, had one of the main landing gears not been damaged by the snowbank which covered the grass. Be that as it may, the aircraft made it to the runway and proceeded up it, gradually veering to the right and leaving the paved and cleared surface.

One of the crewmembers ejected, and although his parachute did not have time to inflate and drop him to safety, his trajectory plus the snow present in the infield combined in saving his life.

The other crewmember rode the aircraft to its inverted halt and was removed from the machine in reasonably undamaged condition.

Without going into the whys and wherefores of the whole thing – which remain pretty much of a mystery at any rate – we will simply quote again the old saying which indicates that "If they built a runway around the world at the equator, inevitably someone would manage to land short and someone else would run off the far end."

They might not however, be as lucky as these two.

Rollover!

By Capt. W. R. Reinhart

Dynamic rollover has struck again! The latest casualty is a Canadian Forces Kiowa. Dynamic rollover has been discussed at length in several flight safety magazines including our own inimitable Flight Comment. While there have been few officially reported cases in the CF of pilots entering and subsequently recovering from dynamic rollover, there are many now wiser fling-wing drivers who will admit to having had at least one brush with this particular devil. They all tell nearly identical stories of lifting from slopes, feeling the aircraft roll, and subsequently being unable to stop the roll with cyclic. They claim their only salvation was generous amounts of hastily applied collective.

The Kiowa in question was operating in a LZ which was sloping slightly to the right and covered with sixteen inches of snow. The snow was heavily crusted. On landing before the occurrence, the helicopter was seated and broke through the crust about six inches. Besides the right slope, the lateral C of G was on the right and the right ski sank more than the left. All the parameters were within limits for take off, however the scene was set. On lifting into a hover the pendulum motion of the fuselage with the C of G on the right probably hooked the right ski under the snow crust. Very little lifting was then required to set up a roll rate which could not be overcome with cyclic. The positive collective application continued to pull the helicopter around the right skid until the inevitable resulted.

Why inevitable? Dynamic rollover is the rolling motion of the helicopter fuselage around one skid which has been effectively stopped from sliding sideways. It can be accentuated by one or more of the following factors as illustrated in the accompanying diagram:

a. crosswind;
b. slope;
c. lateral C of G displacement;
d. tail rotor thrust;
e. skid obstructions; and
f. main rotor thrust

The last factor, main rotor thrust, is the greatest contributor. Indeed, if there is no main rotor thrust, there will be no dynamic rollover. (There's the answer, stay on the ground and be safe!) The rolling motion starts with a lifting due to positive collective pitch. If the disc is inclined in the direction of rollover, the thrust merely pulls the helicopter around the skid. Once a relatively low roll velocity is achieved there may be insufficient rotor tilt to stop the roll depending on the cumulative effects of the six factors listed previously.

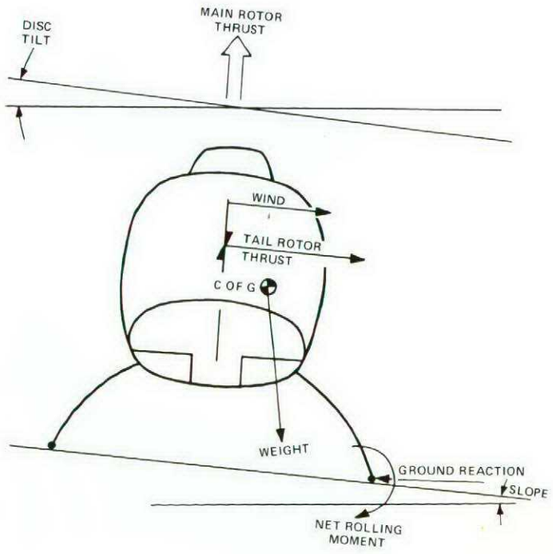
What can be done to prevent being "done in" by dynamic rollover? Perhaps the panacea is slow, carefully controlled, perfectly vertical lift offs which would prevent a roll velocity from developing. Proper slope take offs from all inclines should indicate whether or not there is sufficient cyclic to control a rolling tendency resulting during liftoff.

The accident in question occurred in crusty snow conditions but it is important to ensure that whatever the terrain, the skids or skis are maintained free of obstructions.

While everything happens very quickly, if it is recognized that the cyclic is not stopping the roll, bottoming the collective is the only action which may return the helicopter to the upright position.

What about the wise old drivers and their generous amounts of collective, you ask? They all admit they were extremely lucky and extremely close to becoming statistics. Unless you wish to flirt with disaster, careful take-offs are really the best prevention.

"DYNAMIC ROLL-OVER"
CUMULATIVE FACTORS



Comments

AEROMEDICAL INCIDENTS.

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

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

Readers will doubtless note that the French section of Flight Comment is somewhat thinner than the English in this edition. This is true for several important reasons:

First of all, we are simply not getting French articles – and this imposes a great strain on our translation facilities.

Second, certain articles are received too late for translation and yet are important enough to require fast publication.

The combination of these and other factors causes this imbalance which, it would appear, will be with us for some time to come.

C'est la vie.

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

Royal Canadian Air Force – Canadian Armed Forces – Air Line Pilots Reunion

Those of you who have left us in body if not in spirit – not for the great hangar in the sky but for the "greener pastures" they all talk about are advised that a reunion will be held at the CFB Downsview Officers Mess 28 April 1978.

Accommodations are available at:

Triumph Hotel,
2737 Keele St.,
Downsview, Ontario M3M 2E9

AND if you identify yourself as attending the aforesaid reunion a special rate will apply.

The beautiful aircraft pictured on the cover of the last edition was the Westland Lysander – a WW2 Army co-operation aircraft restored as a centennial project of CFB Winnipeg under the guidance of Capt Bernie Lapointe who is presently flying Chinooks with 450 Sqn in Ottawa and soon will be searching and rescuing in Comox. The negative # is CFC 68-012-1.

This edition features an AVRO Lancaster QY C which in spring 1945 was serving with 6 Bomber Group in Yorkshire. The negative # is PMRC 78-353.

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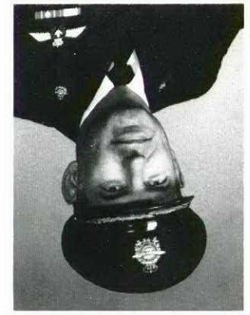
En matière de sécurité des vols, nous avons pour principe de ne jamais blâmer quelqu'un pour une erreur commise de bonne foi. En fait, nous évitons le mot "blâme" lorsqu'il est question d'accidents et d'incidents d'aviation. Nous évitons également de prendre des mesures disciplinaires, de muter ou de rétrograder la personne impliquée, ni même de remuer mer et monde à ce sujet. La raison en est bien évidente. Nous comptons sur l'honnêteté des rapports pour obtenir les renseignements dont nous avons besoin pour notre rôle de prévention. N'incriminer personne, telle est notre devise. De plus, nous ne croyons pas que des mesures disciplinaires puissent prévenir les accidents aussi efficacement que l'éducation. . .

Je crois que notre conception de la prévention des accidents est fondamentalement bonne, mais à condition d'être deux. . . Si les gens refusent de faire face à leurs responsabilités à cause de la souplesse de cette politique, alors nous devrons réexaminer notre position. Si le statut privilégié dont jouissent les rapports d'accidents se traduit par un rapport incomplet et malhonnête, il sera permis de douter de la raison d'être de cette rationalisation du programme. Il me déplaîrait d'assister à un retour de la ligne dure en matière de sécurité des vols, car je crois que la plupart des gens appuient le principe actuel qui, à ce point de vue, donne satisfaction. Tâchons donc de faire notre part pour qu'il n'en soit pas autrement.

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



Our philosophy in flight safety is that we don't blame anyone for an honest mistake. In fact, we avoid the word blame when we talk about aircraft accidents and incidents. We also shun disciplinary measures, career action or even public embarrassment. The reason is straightforward enough. We rely on trust and honest reporting to get the information we need to prevent accidents. No self incrimination is our byword. Besides, we don't believe that punishment will prevent accidents as effectively as education will.

Basically, I believe that our approach to accident prevention is the right one but it has to be a two-way street. If people are shirking their responsibilities because of this "soft" approach, then we should logically reassess our position. If the privileged status of incident reports doesn't lead to complete and honest reporting, then the whole rationale for the flight safety system is suspect. I would hate to see a return to some form of hardline approach to flight safety because I believe that most people actively support the present system. On that basis it works. Let's do our part to make sure that it stays that way.

COL. J.R. CHISHOLM
DIRECTOR OF FLIGHT SAFETY