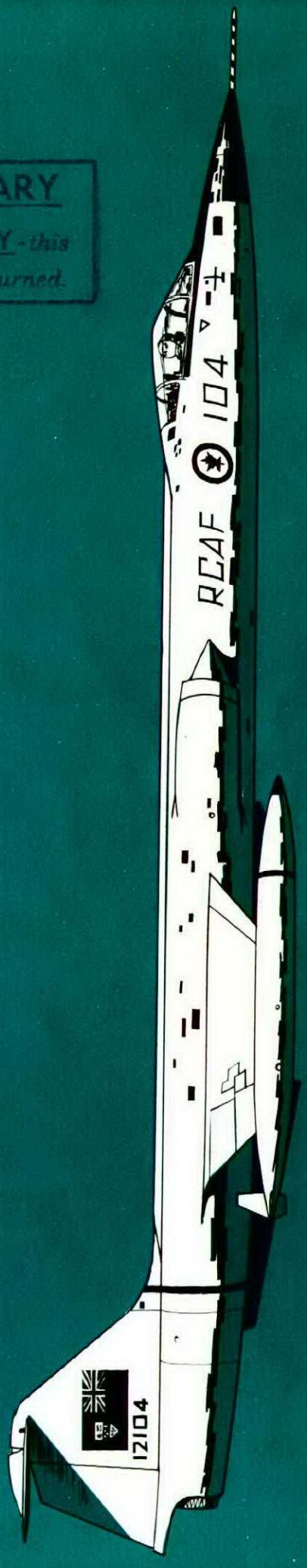
RCAF FLIGHT COMMENT

DFS LIBRARY
LIBRARY COPY - this pub must be returned.



FLIGHT SAFETY IN 1 AIR DIV.

NOVEMBER • DECEMBER • 1962

FLIGHT COMMENT

Editor-in-Chief—Wing Commander D. Warren
Editorial Assistant—Miss R. Mayhew
Circulation—Flight Lieutenant O. G. Amesbury
Artists—J. A. Dubord
H. K. Hames

OFFICIAL INFORMATION—The printing of this publication has been approved by the Minister of National Defence. Contributions are welcome, as are comment and criticism. Address all correspondence to the Editor, Flight Comment, Directorate of Flight Safety, RCAF Headquarters, Ottawa 4, Ontario. The Editor reserves the right to make any changes in the manuscript which he believes will improve the material without altering the intended meaning. Service organizations may reprint articles from Flight Comment without further authorization. Non-service organizations must obtain official permission—in writing—from RCAF Headquarters before reprinting any of the contents of this publication. The opinions expressed in Flight Comment are the personal views of contributing writers; they do not necessarily reflect the official opinion of the Royal Canadian Air Force. Unless otherwise stated, contents should not be construed as regulations, orders or directives.

DFS LIBRARY
LIBRARY COPY - this pub must be returned.

CONTENTS

ARTICLES

FEATURES

ROYAL CANADIAN AIR FORCE
DIRECTORATE OF FLIGHT SAFETY

The role of 1 Air Division and the environment in which it must operate have posed a number of special Flight Safety problems in the past. These problems will increase in number and severity in the near future when the Air Division becomes equipped with very advanced aircraft and assumes a new role in the NATO forces.

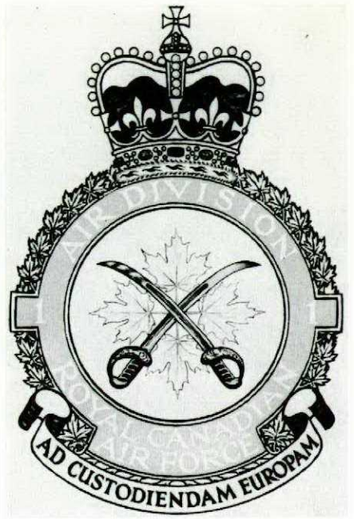
The steadily declining accident rate in the Air Division, as in the RCAF as a whole, leaves no doubt that Flight Safety efforts are paying off. This does not permit us to rest on our laurels however, and a very determined intensification of our efforts in 1 Air Division is required in the face of the approaching transition phase.

Our task is the fulfilment of our allotted operational role in NATO, and this cannot be done without accepting a certain amount of calculated risk. The aim of Flight Safety in 1 Air Division is to ensure that the degree of risk-taking does not go beyond that dictated by operational requirements. Luckily the old rule that "the safe way is the most efficient way" generally applies, and only rarely will a conflict of interests make it necessary to accept a Flight Safety hazard dictated by operational necessity.

We feel sure that the stress that has been laid upon professionalism in aircrews and groundcrews has been a major factor in the reduction of aircraft accident rates in the past. We are equally confident that the attitude developed thereby will make 1 Air Division personnel accept the challenge of our changing role with a determination to enhance our operational capability through the establishment of a good Flight Safety Record.

(L. E. Wray) A/V/M
Air Officer Commanding
1 Air Division

Flight Safety in 1 AIR DIVISION



Flight Safety in 1 Air Division presents problems that are different from those encountered in other Commands. These differences are best understood if we examine the conditions or environment in which Air Division aircraft operate.

To most RCAF Commands, airspace is not much of a problem; they either have a large chunk of wild blue yonder all to themselves, or, they operate in an area where uniform methods and positive control assures a reasonable degree of air safety. The risk of having two aircraft trying to occupy the same piece of sky simultaneously is therefore minimal. In the case of 1 Air Division, however, things are different. The airspace in which it operates is not only limited, (covering an area roughly two-thirds the size of Ontario) but it is also one of the most densely occupied airspaces to be found anywhere in the world. To further complicate matters, control of this airspace is divided among several nations each of which publish their own air traffic regulations. These regulations are basically similar, but there are differences sufficient to trap the unwary and keep fliers from dying of old age. For example, a study of European flight rules reveals that on many airways the altitude requirement changes as they cross from one country's airspace to the next. This information is published so that you need only to be able to read in order to obtain it. However, when it comes to deciding at what point you should change altitude in the air you had better have your rabbit's foot handy because although the Air Traffic Control agencies in each country normally co-operate very well with one another there are some occasions when communications are difficult. For these occasions no one has, as yet, devised a method by which a pilot can distinguish one country's air space from another's, either by sight or smell.

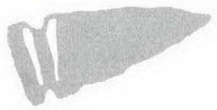
Another aspect of the environment that contributes to the worried look on the faces of all Flight Safety Officers and keeps flying from becoming a boring routine in Air Division is the problem commonly known as the Bird Dog Blues. It refers, of course, to the fact that virtually all air navigation in Europe must be accomplished by using the Radio Compass and non-directional radio beacons. The real problem, however, stems from the fact that there are far more beacons required than there are frequencies to put them on. Thus beacons are jammed-in wherever there is a kilocycle to spare. To reduce interference, the beacons are restricted in ways that we are not accustomed to, such as the amount of power and the type of signal emitted. Sadly enough, these do

by Staff Officers
1 Air Division

not take care of all the interference which occurs to radio beacons in Europe.

Generally speaking, the bird dog blues can be overcome by referring to the Radio Facility Chart, proper manipulation of the radio compass and frequent checking of the beacon identifiers. If this is not done it can very easily occur that, after a few minutes of carefree on-top flight the bird dog is still homing but not to the original beacon tuned in. This has actually happened, much to the consternation of more than one Maple Leaf-type tiger. On one occasion, it proved not only embarrassing, but also caused an aircraft to be written off in a spectacular fashion before a rather select audience of whirly-bird fanciers. Naturally they felt honoured and impressed by the visit although somewhat confused as to why the pilot of an aircraft which normally scorned anything less than a mile of concrete for landing should suddenly decide to visit them. The pilot, of course, didn't want to hurt their feelings so he never told them, but the truth of the matter was that he had been a victim of the bird dog blues.

Communications facilities also suffer from the shortage of frequencies although the introduction of UHF has lessened the problem considerably. Still, if a pilot is unfortunate enough to have to declare an emergency and then omits stating the agency from whom he expects to obtain help, the response may prove so overwhelming that he may wish he had kept his mouth shut. Even when an agency is specified it sometimes requires the most determined resolution on the part of the pilot to get what he wants. To verify this statement, here is an

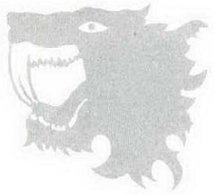


account of an incident which took place some time ago. The story is absolutely true except that the name of the controlling agency has been changed in order to avoid any undue embarrassment.

A gentleman from the deep south, with a call sign of Blue Three, was "motoring" along at altitude when an emergency occurred. The appropriate radio distress frequency was selected and the following conversation ensued. (NOTE - the usual southern drawl must be read into all Blue Three's transmissions to fully appreciate the story).

Blue Three: Crackpot Control, this is Blue Three.

Crackpot Control: Roger Blue Three, this is Crackpot Control reading you five square on Guard frequency.



Blue Three: Roger Crackpot, Blue Three here. Ah have a wee bitty fire in the nose of this here aeroplane and the cockpit is agettin pretty full of smoke. Would you all give me pigeons to Soellingen?

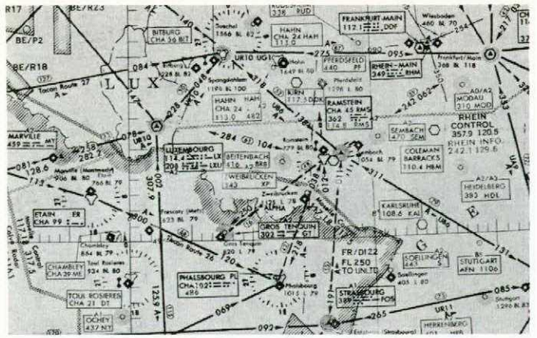
Crackpot Control: Roger Blue Three. Understand you have an emergency. Your pigeons Ramstein are 350° for 80 miles.

Blue Three: Roger Crackpot, but ah all asked you for pigeons to Soellingen, not Ramstein.

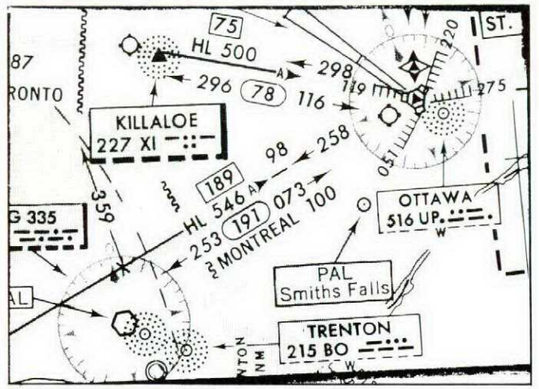
Crackpot Control: Blue Three, your pigeons Ramstein are 350° for 80 miles.

Blue Three: Now you all looky here Crackpot. Ah didn't ask you for pigeons to Ramstein. Ah want pidgeons to Soellingen and Ah want them right now! Ah got a log of smoke in mah cockpit and Ah may have to jump out of this here (+& ≠! +&≠ !) aeroplane. (PAUSE)

Blue Three: This is Blue Three calling any control agency except Crackpot—and Crackpot don't you all answer this. Blue Three is squawking four and Ah request immediate pigeons to Soellingen.



These two charts show areas, equal in size, of Europe and Canada. The congestion of navigational aids and facilities in Europe is readily apparent.



Our "you all" friend finally got his requested pigeons and landed safely—a most frustrated individual.

The old adage that "too many cooks spoil the broth" hardly seems an appropriate saying to use when speaking about flight safety, generally, safety is everybody's business. However, in many ways this saying appropriately applies to flight safety in 1 Air Division.

Air Division as a NATO Air Force occupies bases that were built by NATO, to NATO standards, with NATO funds. Consequently any changes or additions that are needed must be approved and paid for by NATO. A poor overrun, for example, to be rectified must have the work and expenditure approved by AFHQ, Air Forces Central Europe, and NATO funding, before authority can be granted. Then the country wherein the base is located must arrange bids and contracting. Even with everyone working at top speed such procedures are bound to take time. The fact that work is accomplished in a satisfactory manner shows how good co-operation is within NATO.

So much for the influence of the environment and NATO on flight safety in Air Division. Now let us examine Operational Characteristics. There is no doubt that this has contributed the greatest share to the Air Division's accident rate over the past ten years. There are many reasons why this is so, but the most important one is the high degree of mission capability and effectiveness which the Air Division has had to maintain. In essence, this has meant keeping a peace time Air Force capable of fighting a defensive war on a moment's notice.

The strenuous requirements entailed by such a responsibility are obvious, especially in view of the type of operational flying involved. In the first place it demands that all personnel be thoroughly trained; second, that they are confident of their ability and capable of exploiting both their skills and equipment; third, that a dedicated and aggressive spirit must be developed in everyone.

Training for this requirement must be realistic and encompass a certain amount of risk. It cannot be accomplished with a never-on-

Sunday approach—at least not until the desired degree of operational efficiency is attained. Unfortunately this type of training—even when closely monitored and supervised—can have a consequence which is detrimental to flight safety, viz. the "calculated-risk-philosophy" of operational flying is often applied to other types of flying. As a result aircraft are sometimes "bent" although there is no operational requirement that makes it necessary to take a calculated risk. It is very difficult to make a tiger act like a pussy-cat some of the time.

In the operational sphere there is another problem which besets Air Division—aging aircraft. Despite the fact that everyone hates to admit it, the heap of D14s finalized with a "Materiel" assessment bears silent witness that our aircraft are getting old. There are numerous people who claim that this should not present a problem. After all, they reason, the aircraft are better known and have had all the kinks worked out of them. But have they?

Last year there were two aircraft lost in Air Division due to false fire warning lights—hardly a new problem. The sad thruth is that aircraft, like humans, get weaker as they grow older. Nevertheless, incongruous as it may seem, the aircraft must be returned from maintenance to the line in the same period of time as when it was younger; the percentage of serviceable aircraft required remains the same because the UE (units establishment) is unchanged; and the training hours remain the same because aircrew must maintain the same standard of proficiency. The result of this circle bears obvious implications for flight safety.

It is a fact that flight safety hazards in 1 Air Division are many and varied. They are the consequence of the task of the Division and the aim of the Flight Safety staff is to reduce the hazards and thereby strengthen our operational effectiveness. ✔

CAN YOU SAY "NO"?

As simple as it sounds, and although it has only one syllable, the hardest word in the world to say is "No". Every once in a while a D14 crosses the desk which says, as surely as if it was listed in the conclusions of the board, "Somebody didn't have the guts to say "No!"

It doesn't have to be the CO. Why should he always be the hatchet man? The Ops officer, Training officer, or flight commander could have a little more iron in the backbone, too. Military flying is not a profession in which every man tries to win a popularity contest.

Someone has to cull over the flight schedule to make sure each man progresses normally, and doesn't run before he's learned to walk; and to keep fledglings from expending themselves needlessly. This is the time for decision and the exercise of true leadership.

The pilot who flies an 0730 hop on Friday morning should never be cleared for a long "nav training" cross-country RON trip that night. Either the night hop is worth scheduling, and it is worth bringing the pilot on duty at the hour you'd usually have night flyers come in, or IT SHOULDN'T GO!

A tired pilot's instrument cross-check breaks down too often. He makes errors that would make a check-pilot blush with shame; he forgets to check NOTAMS on his destination or enroute radio fixes; he collides with his wingman; he stretches his fuel too far; he pushes his skill in weather; and he takes too many darn-fool chances.

The younger pilots think we have too many restrictions. Why are we restricted to military fields on cross-country flights? Ever see an aircraft barrier on a civil airport? Or a military-type crash crew? A pilot in the States slowly smothered in his cockpit at a civil airport recently, while the local fire department tried to figure out how to raise the tail of his overturned bird. Poor flight planning and lack of experience put him in a spot. He wasn't ready for a cross-country. Someone should have said "NO".

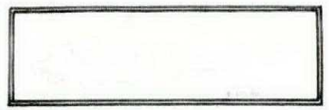
For the new man, a "No" is not a disgrace. Just work a little harder and earn your CO's recognition as a man to whom he can say "Yes". A really good pilot can go anywhere, any time, and has the judgment to know when to say "No" to himself. That's when he's really a professional.

Adapted from "Memo from Gramps"
U.S. Naval Aviation News

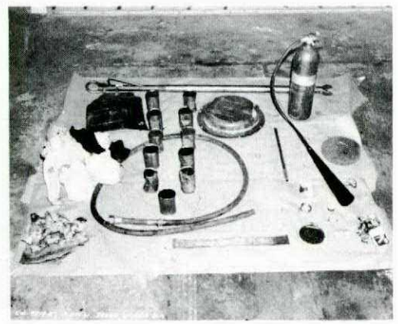
These photos show the results of FS CG McConnell's efforts. They are excellent examples of local participation in the field of flight safety education. Are you doing your part?

FOD

"F O Dispenser"



FOD



"Potential"

F/O E. Lukan

F/L F. Hastings

F/L Fred Hastings departed from Winnipeg for St Hubert in CF100, 18680, cleared to maintain flight level 330. The aircraft was vectored eastbound using frequency 137.7 onto a heading of 090 to report through 10,000 feet. The pilot reported leaving 10,000 and was "handed off" from Winnipeg Departure Control to Winnipeg Centre East Radar.

Approximately ten minutes after take-off, F/L Hastings experienced complete VHF failure in the form of continuous channel change or continuous DF tone. While attempting to rectify radio problems the cabin pressure failed. He turned toward base and initiated a blind transmit on the last known serviceable VHF channel 137.7. He let down to 18,000 feet maintaining 1000 on top and flew a left hand distress pattern listening out on 248 and 278 kcs, with no result.

In the meantime when departure control had advised F/L Hastings to contact centre on 119.7 they received no reply. All attempts to contact him were negative. Centre was advised. The aircraft had been followed on radar to a point 70 miles east and at that time the departure controller changed to the 30 mile presentation due to terminal traffic.

Shortly after this, Neepawa Radio advised of an emergency tone on 121.5 and likewise, Portage and Gimli reported tones on 121.5. They gave ADF bearings which corresponded to the position of F/L Hastings. On receipt of this information both departure and air traffic control observed a target apparently flying a left hand triangle. By now it was established that F/L Hastings was in trouble. Centre alerted GCI sites, Duluth and Grand Forks SAGE, and passed radar identification to Kenora.

When Portage and Gimli were asked if there was an aircraft airborne that could be used to intercept, it was reported that F/O Eugene Lukan had taken off in a T33, 21170, from Portage on a training mission. Portage advised F/O Lukan to contact Winnipeg as they had a CF100 in their area in difficulty. Subsequently F/O Lukan changed to Centre frequency 294.5 mcs. He confirmed that he had sufficient fuel for an intercept (two hours) and was identified over the Portage Outer (AG) Beacon by Centre Radar. He was then vectored toward the observed distress pattern bearing 065, 69 nautical miles from Winnipeg.

Visual contact was made. F/L Hastings, whose canopy was almost completely misted over, formated on F/O Lukan. Control advised of weather in the area and a decision was made to do a radar descent with a GCA pickup at Winnipeg. Because F/O Lukan was not familiar with the CF100, and radio contact could not be established, a normal T33 descent was carried out.

F/L Hastings interpreted all visual signals correctly and flew excellent formation throughout the let-down. Radar positioned them at 10,000 feet, ten miles, so a 360 was done at this point to get down to the GCA glide path. During this portion of the let-down, the cloud was very thick, and only a faint outline of the CF100's port tip tank could be seen. The let-down was completed and once below cloud (1000 AG) F/L Hastings did a low approach, overshot and then performed a normal circuit and landing.

During the approach and landing sequence, control had Mr. Bernie, a test pilot with Bristol aircraft, standby on the phone, in case further information was needed.

F/L Hastings later advised that he had experienced radio failure after switching from terminal control to centre frequency and that he had lost all cabin pressure a short time after. He also explained that he overshot on the first approach because he was too heavy on fuel to land.

F/O Lukan then returned to Portage and a short while later received a "thank you" call from F/L Hastings.

This is a good example of all concerned reacting quickly and efficiently and doing an excellent job to recover a distressed aircraft. It is also a good example of emergency procedures carried out properly and working as they should.

The pilots, and controllers on duty, who were J. H. Bradley, T. C. Hayes, A.H. Vanderpont, E. J. Weinheimer and W.H. McConnell, supervisor, are all to be commended on a job well done.

LAC J.A. Salsman

During a routine inspection of an Otter, LAC Salsman noticed a black sooty residue on the hot air pump duct. Investigating further, he found the exhaust pipe assembly had burnt through inside the carburetor heater muff and the hot air duct had broken away from the heater.

LAC Salsman's conscientious performance of his duties his alertness and keenness undoubtedly helped to prevent a serious aircraft accident.

Flight Comment extends congratulations for this Good Show.

DFS LIBRARY
LIBRARY COPY - this pub must be returned.

F/L BF Gilland

F/L GL Fitzsimmons

F/L FG Fowler

Flight Lieutenants GL Fitzsimmons and FG Fowler, on separate occasions, when flying CF104's experienced exhaust nozzle failure.

Utilizing their excellent knowledge of the aircraft and skilfully assessing the situation they both obtained afterburner lite-up and flew back to base, where successful landings were carried out.

F/L BF Gilland also deserves a good show for the professional airmanship he displayed on a flight when his exhaust nozzle failed to the open position and the manual nozzle switch had no effect. His in-flight diagnosis of the problem and the skilful manner in which he overcame the mechanical deficiencies and landed at base, earn for him high commendation.

ON GETTING UNDERSTOOD

by F/L G. O. H. Poulsen
1 Air Division

During the first half of 1962 two Boards of Inquiry in Air Division have had the opportunity to study the confusing effects of lack of clarity in R/T transmissions preceding aircraft accidents. The recommendation that "the importance of clarity and use of standard R/T phraseology be stressed to aircrew and tower personnel" pops up repeatedly in the Boards.

While everyone agrees that troubles may be expected if you try to convey complex theories of the Einsteinian or Kantian type to your neighbor, they seldom see any major problems arising from conveying simpler thoughts in a few words. But words are ambiguous. Often you can guess which of the meanings is applicable, but not always. Even electronic computers with their logical channeling can get stuck on an ambiguity as the following anecdote demonstrates.

A young second lieutenant had the opportunity to operate a huge computer "down south" and was, of course, somewhat impressed by the omniscience of this machine. He decided to get some important info from the beast and fed into it the 64,000 dollar question: "Is there going to be a war"? The machine whirled and rattled, lights flicked on and off, tape was swallowed. Finally the answer came out: "Yes". Well, the young second looie thought this was a little too cryptic, and to get a few more details on when and where, he fed in the question: "Yes, what"? The machine rattled and blinked again and the following answer came out: "Yes, sir".

Communication is like a game played in partnership by the speaker and the listener against the forces of confusion, or, if you want, a jamming agency. This jamming agency is not always adopting the best policy to confuse you, since, as Einstein said: "Der Herr Gott ist raffiniert, aber boshaft ist er nicht" (God may be subtle, but he is not plain mean), and therefore nature is not deliberately out to confuse and frustrate us. Still, the difficulty in getting understood is much greater than most people suspect.

From the point of view of information theory our languages are very inefficient as means of conveying information. The linguistic structure of English is about 60% redundant relative to the information transferred with the same number of letters arranged in random order. In other words, less than half of the letters we write are due to our free choice, while the remainder are being dictated by the structure of the language.

Since the number of possible messages of R/T conversation is less than the set of possible messages of the parent language, less information per word is actually transferred with this sub-language; its redundancy is about 75%. Furthermore, due to the situational restraints of the control tower language, this sub-sub-language has a redundancy of about 96%. These figures probably shake a flying control officer, but they are the result of research. The controller cannot be blamed for this, not even by his wife. The reason why it would appear that a few R/T words "tell a lot" is that they "trigger a code", but the words themselves convey very little as anybody will agree who does not know—or has forgotten—the "code".

Sadly enough, it is not possible to overcome the redundancy problem by substituting the controller with a fast speaking woman. There is a definite channel capacity even for her; the receiver's discrimination capability is limited; a "confusion effect" occurs.

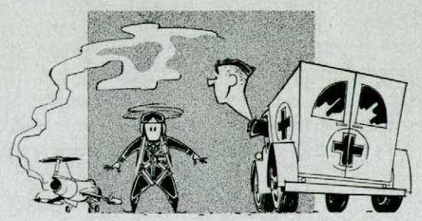
On this background it appears strange that we do get very much "across" in R/T conversations of short duration. But, of course, it must be remembered that the people speaking and listening use their knowledge of each other's problems to guess what is wanted, although the full details are not included in the words transmitted. As shown by the anecdote above this can backfire since the computer, knowing the pride a second lieutenant takes in his rank, cannot be blamed for concluding that the query concerned the missing word of courtesy.

So

--Do not forget that communication is a continuous fight against confusion;
--Use the standard phraseology, since the interpretation of those words has been agreed upon;
--Be sure you know the standard phraseology, i.e. the "code";
--Be brief, but say all that is necessary.

(Gamma Pi)

F/L Gunner Oluf H. Poulsen, TECH, AE, was born and educated in Denmark, obtaining a bachelor of philosophy and a mechanical engineering degree. He served with the Danish Guards during the Second World War and joined the RCAF in March 1953. After training at London, Portage and Aylmer he was posted to Portage in April 1955. A year later he moved to AFHQ and has been on the Flight Safety Staff at 1 Air Division since September 1960.



NEAR MISS

MORE RED TAPE

After an apparently normal takeoff and while climbing through 5000' the pilot of a T33 noted that air speed and height readings were abnormal. After levelling off above cloud, assistance was called for. Another aircraft joined in formation and confirmed that the air speed indicator, altimeter, mach meter and vertical speed indicator were grossly inaccurate.

A successful formation letdown and landing was made and on shutdown it was found that red plastic tape had been placed over the static air vents to prevent water entering while the aircraft was washed.

The aircrew and groundcrew concerned were admonished, and all station personnel concerned with aircraft operation, were briefed on the cause of this near miss.

In addition, positive preventive measures have been taken, in that a UCR has been raised and the design of a static vent covering with streamer attached has been submitted.

DFS LIBRARY
LIBRARY COPY · this pub must be returned.

WINTER WEATHER HAZARDS

W. G. Lewis
SOMet ATCHQ

Every year, about this time, articles on the hazards of winter flying operations appear in aviation literature. The writer usually views accidents of the former winter, indicates why they happened and the lessons to be learned. The same warnings to pilots are repeated.

Meteorological records show that the winter of 1961-62 was about the same as other winters. A review of accidents attributable to the vagaries of winter weather reveal that nothing new has been added. The same old warnings are still valid—the same accidents continue.

A close look at the basic problem shows the rather surprising fact that most of our weather difficulties develop because water is capable of existing in three different forms.

VAPOUR LIQUID SOLID

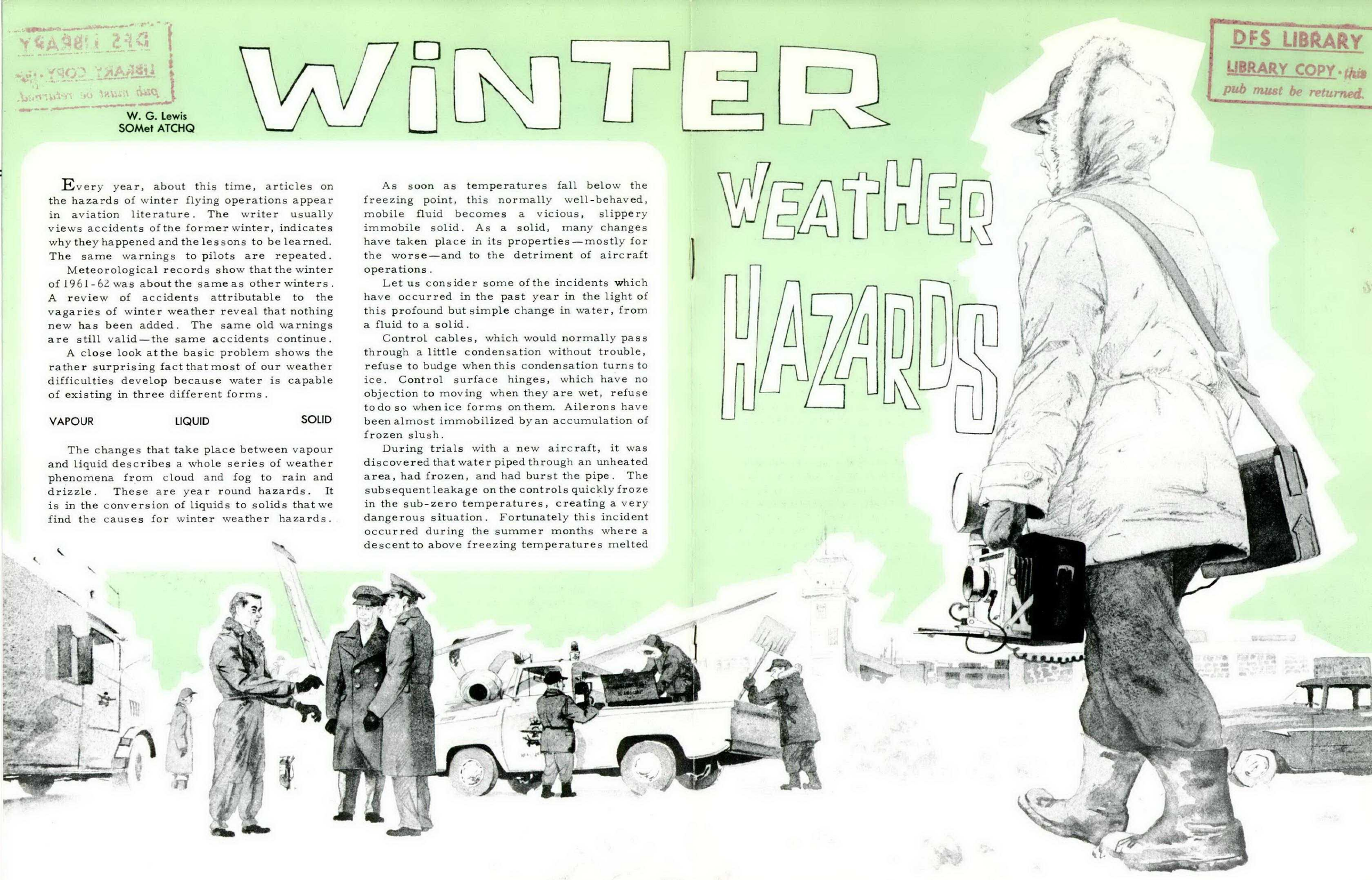
The changes that take place between vapour and liquid describes a whole series of weather phenomena from cloud and fog to rain and drizzle. These are year round hazards. It is in the conversion of liquids to solids that we find the causes for winter weather hazards.

As soon as temperatures fall below the freezing point, this normally well-behaved, mobile fluid becomes a vicious, slippery immobile solid. As a solid, many changes have taken place in its properties—mostly for the worse—and to the detriment of aircraft operations.

Let us consider some of the incidents which have occurred in the past year in the light of this profound but simple change in water, from a fluid to a solid.

Control cables, which would normally pass through a little condensation without trouble, refuse to budge when this condensation turns to ice. Control surface hinges, which have no objection to moving when they are wet, refuse to do so when ice forms on them. Ailerons have been almost immobilized by an accumulation of frozen slush.

During trials with a new aircraft, it was discovered that water piped through an unheated area, had frozen, and had burst the pipe. The subsequent leakage on the controls quickly froze in the sub-zero temperatures, creating a very dangerous situation. Fortunately this incident occurred during the summer months where a descent to above freezing temperatures melted



the trouble. How different the situation would have been had this happened in winter with no probable means of relief!

Water, as a solid mass of clear ice, retains most of its transparency, but in crystal form it does an effective job of blocking the view. The sudden restriction to visibility that occurs during a snowstorm is a good example. Fortunately, the restriction due to snow showers is usually short-lived, and a twenty minute delay will usually result in a change for the better. Under emergency conditions this delay may not be acceptable and a forewarning of the possibility should enter our plans. The reduction in visibility caused by blowing snow is more troublesome because it is more prolonged.

This unpleasant capacity for restricting visibility occurs in another way, as is well known to anyone familiar with freezing rain. When supercooled droplets impinge on unheated windshields they very soon form a sheet of ice which may be translucent, but is certainly not transparent. The fact that water can exist as liquid droplets at temperatures well below freezing is, of course, well known. The fact that it changes so rapidly from the liquid to the solid state as soon as it strikes an unheated surface is the real hazard where aircraft are concerned. Then, instead of flowing freely from the wings like rain, it sticks, accumulates and covers them with a layer of ice which radically changes their well-designed aerofoil shape. We must, therefore, be made aware of those areas when an icing potential exists so that we may be prepared for it.

The effectiveness of anti-icing equipment depends on its activation before icing occurs—not after. Forecasting the details of a particular icing situation with a high degree of confidence is extremely difficult. However, the service which can be provided with more reliability is in indicating areas where the icing situation is a potential one. This is the most important information which must be sought in advance.

In changing from a liquid to a solid to form snow, water loses the convenient property of mobility on the ground. No longer will it flow neatly to the edge of the runway and thence down the drain. Instead, it must be pushed and piled constantly to keep it under control. Many accidents continue to occur as a result of this inconvenient change in properties. It may form hard-packed difficult-to-remove drifts and windrows on the runway. Even when removed great care must be taken to ensure that the solid snowbanks formed by the removal equipment, do not, in themselves, present a greater hazard.

During the transition period of the year, we are frequently faced with the problem of slush. In this case, wet snow and water coexist to form a heavy barrier on the runways which will not flow away easily like water, nor blow away easily like dry snow. The drag which it creates on aircraft wheels is a major one, and must be carefully watched even at depths of less than half an inch. In addition, slush can cause considerable trouble as it refreezes after being splashed up on the landing gear and flap mechanisms.

In many ways, the most important quality that water possesses when winter commences is that of being slippery. Without this quality the multi-million dollar skiing - hockey - curling industry would not exist.

This property is also responsible for a winter increase in ground handling accidents. Normally well-behaved equipment becomes uncontrollable on glare ice or, even worse, ice covered with a thin layer of water. Forklifts skid into aircraft and punch gaping holes in the pressurized skin. Aircraft skid into forklifts, other aircraft and into equipment, with similar results. Again, a forewarning of these conditions is needed so that anti-skid measures can be taken promptly to improve the braking action for all vehicles.

The human element also makes us prone to accidents. The discomfort caused by a shivery outdoors understandably generates more haste and less caution through a natural desire to get back to more comfortable surroundings.

The change to the solid state is not entirely a disadvantage. In fact, the smooth landing surface presented by ice-covered lakes and rivers was of great practical value during the construction of the Mid-Canada line. The hazard in this case, however, arises when such ice cover has insufficient strength to support heavy loads. Therefore great care must be taken to ensure that there is adequate ice thickness, before landing operations can be undertaken.

All the above has been directly related to the change from water to ice in one form or another. It is probable that the next most important single cause of damage, though not exclusively in the realm of winter, is strong surface winds. They are more prevalent in winter than in summer but are easier to predict than other facets of the weather. A visit to the local weather office to discuss our requirements for wind warnings should be made before the start of winter so we can be prepared for unusually strong blows. Wind damage should then be negligible.

The operation of modern aircraft during winter conditions, although a time of increased hazards, can be successfully carried out without an increase in accidents. Accidents don't happen—they are caused, and their cause is usually the result of negligence. During winter driving conditions, every vehicle driver must exercise extra caution to avoid accidents. Airframe drivers must do the same.

WINTER THRIVING?

S/L Kenneth Hobbs
MD MPH
Human Factors Engineering
AFHQ

At this time of year when we should be reviewing the flying hazards peculiar to the fall, winter and spring, perhaps we should also give sober thought to some of the human, social hazards of these seasons which may be detrimental to flight safety (if we are not too preoccupied with dismal visions of Christmas budgets).

The onset of cool, damp or cold weather and the coincident indoor congregation of people heralds an increasing prevalence of minor contagious diseases, such as the ubiquitous common cold and the "flu bug". Although only annoyances to most, these infections may seriously disable aircrew and groundcrew concerned with vital flying and support tasks. If you are ill, even a little, don't be a martyr. Stay away from the flying hardware.

Here is a word of caution to the amateur medics. Experience may have taught you to recognize common ailments and to administer remedies, but it is difficult to be an unbiased judge of yourself. You can easily misinterpret the nature and degree of an illness. Even doctors hesitate to treat themselves. Nearly all drugs, including the great variety of patented medicines, are potentially dangerous or have ability impairing side effects even in competent hands and when approximately prescribed. Taken while flying they can be lethal. If you are sick, see your MO and don't aviate or take drugs unless he advises. He who doctors himself may have a fool for a doctor.

This time of year is also the start of the social season in which the taking of alcoholic beverages forms part of pleasurable and well-regulated customs. But, let's face it, occasionally some of us over-indulge, particularly in the festive season and must pay for our indiscretions with the miseries of the after-effects. Hang-over disability, compounded by lack of sleep, may last much longer than the 8-hour abstinent period required by current Orders, and may extend into a scheduled or unscheduled work period. If this happens and you are in a high-performance task, swallow your pride and get your duty schedule changed. Your responsible attitude will be respected and you will avoid the risk of tragedy. Obviously, this should happen twice in an individual's service career—the first and last time!

As the seasons wear on, relative inactivity and feasting may produce some serious errors in the weight scales and a shrinking of clothing. Let's not panic, heroic extremes of starvation dieting or violent spasms of physical exercise are more harmful than beneficial to physical fitness. If you do need to diet, do it slowly and get some advice. Whether you are a sport or a seclusive 5BXer take your exercise in regularly graded doses, avoiding exhaustion. In fact, start now and avoid the rush later.

The guiding rule for personal fitness is: all things in moderation.

AIRCRAFT TOWING

by F/L D. W. Cooke
Air Defence Command

The author, F/L D. W. Cooke, of Air Defence Command Headquarters, was a pilot overseas during World War II. He is an engineer graduate from the University of New Brunswick.

He served as squadron engineering officer at ADC, squadron engineering officer and OC Maintenance at 1 Fighter Wing, Luffenham, England. On return from overseas he did a tour at Air Materiel Command Headquarters, 1954-58; 11 TSU 1958-61 and has been at Air Defence Command since 1961.

Aircraft towing continues to be a major source of ground accidents, in spite of many years of experience and the development of a comprehensive engineering order on the subject, EO 00-50-19. The main reason for this sorry state of affairs is a reluctance of technicians to adhere to the basic safety precautions laid down in the EO.

The tractor driver often exhibits many qualities required by a successful Grand Prix driver, limited only by the capacity of the tractor. Failure of the NCO to spare an adequate number of men also contributes to the unit accident potential. It is inexcusable to tow aircraft with less men than minimum safety allows. To compound the foregoing, carelessness continues to play a major part in the endless parade of towing accidents.

Without doubt, most units have manpower problems. To "save" manpower by reducing the number required for a towing crew is almost certain to result in a waste of men and materials and repairing needlessly damaged aircraft.

Regulations covering the towing of aircraft are basically common sense and have been developed as a result of years of operating experience. Each aircrew officer and senior NCO should be familiar with these regulations and should report any infractions to the unit aircraft servicing officer or his deputy.

The following is a brief review of the basic aircraft towing regulations which are found in detail in EO 00-50-19.

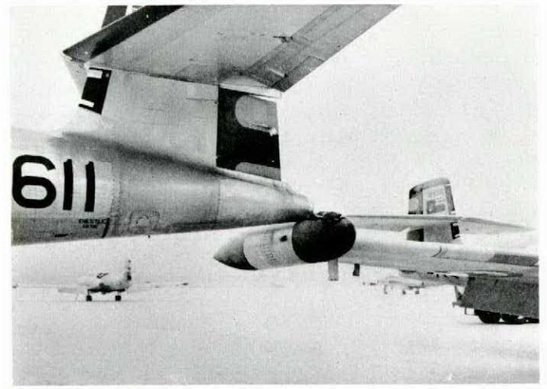
(a) Towing must always be accomplished by the use of approved vehicles driven by qualified drivers.

(b) The NCO i/c shall station airmen at the wing tips; an airman in the cockpit who will ensure that the undercarriage lever is "DOWN", that hydraulic pressure is adequate for braking, and that the nose or tail wheel is unlocked. If the aircraft is to be backed up, an airman must be stationed at the tail.

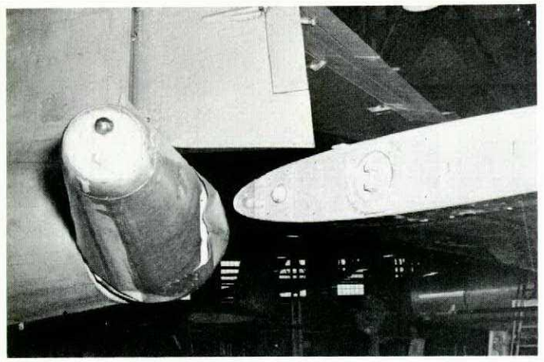
(c) The NCO i/c shall walk in such a position to be able to see both wing tips and all detailed personnel. He will direct the driver using NATO marshalling signals.

(d) The aircraft shall be towed at a walking pace—less than 4 MPH. It must be started and stopped smoothly to minimize strain on the aircraft and to avoid shearing the tow-bar shear pin. In addition, personnel must NEVER get on or off moving aircraft.

(e) Unless specified in the applicable EO, aircraft should always be towed forward



Nobody at the starboard wingtip



A Swing tail CF100—the NCO i/c was driving the tractor instead of doing his own job

rather than backward.

(f) The correct tow-bar must always be used and if the ground is uneven, a bridle must also be used.

(g) Prior to towing aircraft fitted with external stores, all switches must be in the OFF position.

Since the foregoing rules for towing aircraft are self-explanatory, it is not necessary to enlarge on them at this point. It should be stressed, however, that wet tarmacs and winter conditions will demand considerably more care and towing speed should be reduced accordingly. The reason for this extra care and reduced speed is the possible inability of either tractor or aircraft to obtain effective braking on a slippery surface. This point cannot be emphasized too much by supervisors.

When the tractor gets effective braking and the aircraft does not, the result is usually referred to as JACK KNIFING. Under this condition the aircraft and tractor receive varying amounts of damage and the tractor driver could receive fatal injuries. The results vary directly with the speed at which the operator is towing. At high speeds, the tractor has been known to end up jammed under the aircraft wing with the possibility of the driver being crushed between tractor and wing. Naturally at a very slow speed the results should be minor, with a good possibility of no damage and little chance of injury.

In the case where the aircraft gets effective braking and the tractor does not, the results are usually a sheared tow-bar shear pin and possible stress damage. From this it is apparent that the correct shear pins must always be fitted to tow bars and again it will be seen that low speeds will minimize any resulting damage.

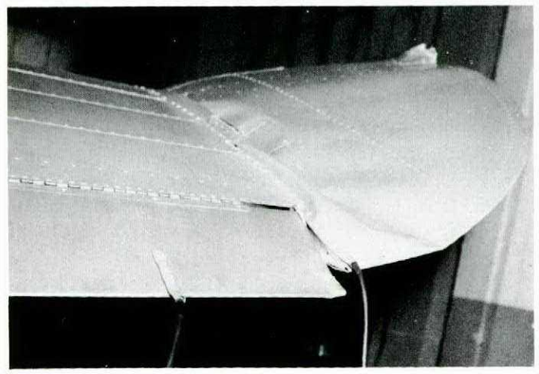
Most instances of high-speed towing occur in fighter aircraft operations. Since the day of the Siskin, in the late 1920's, fighter aircraft have increased in size and all-up weight, until we arrive at todays all-weather CF101B which can weigh over 51,000 pounds at takeoff configuration. Despite this increase in size and weight, line-crews continue to tow with the same gay abandon that was used during the war years, not realizing that today's fighters weigh more than a World War II medium bomber.

It cannot be emphasized too strongly that an aircraft weighing 25-1/2 tons moving at 4 MPH has a tremendous amount of momentum which takes a lot of stopping. This calls for caution, teamwork and strict adherence to regulations particularly with regard to speed.

It would not seem out of place at this juncture, to mention in passing, that the CO of 425 (AW) F Squadron at Namao decreed that CF101B aircraft were not to be towed at a speed greater than 2 MPH. The result of this ruling has been a towing accident-free record during the entire conversion period at Namao. This certainly indicates that extreme care resulting from good discipline is one of the best means of preventing towing accidents and for that matter all other ground accidents.

Emphasis has been placed here on towing fighter aircraft. Transports such as the Yukon, North Star and Comet do not allow easy manoeuvering or high-speed towing but failure to judge the span of wing tips causes many towing accidents to these aircraft.

Since winter conditions are here, a few additional words on this subject would not be



pronounced dihedral

out of place. The increased hazards which accompany cold weather, snow, sleet, freezing rain, cannot be overemphasized. During precipitation, the tarmac becomes slippery and visibility is often seriously reduced. Personnel discomfort tends to lower efficiency in these conditions. In addition, the dangers of high snow banks increase the importance of stationing a man at each wing tip. It must always be remembered that snow and ice are considerably more slippery when wet and extra care must be taken when temperatures rise above the freezing point.

Finally, prior to towing during the winter months, groundcrew personnel must ensure that brakes are functioning properly since the danger of frozen brakes is always present when aircraft are left at the mercy of the elements during this period. Winter operations can be summed up simply as a period when additional care must be taken due to:

Reduced traction
Reduced mechanical efficiency
Reduced visibility and
Personal discomfort

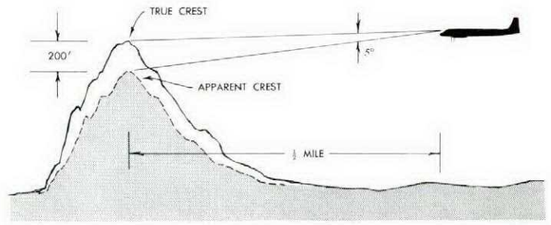
In conclusion, it is stressed that aircraft towing accidents are avoidable, in fact inexcusable. Education, discipline and good supervision can eliminate this needless waste of time, money and possibly life. If every officer makes it his business to report all instances of breaches of regulations; if all personnel concerned are fully conversant with the regulations in accordance with EO 00-50-19 and if NCO's in supervisory positions enforce these regulations; damage to aircraft and tractors will be avoided, injuries to personnel averted and disciplinary action resulting from towing accidents eliminated.

Remember, the cause of most towing accidents is excessive speed--another instance of "Haste makes waste".

FLIGHT IN RAIN

The attention of all pilots is drawn to an error in vision which can occur when flying in rain.

The presence of rain on the windscreen, in addition to causing poor visibility, introduces a refraction error. This error is due to two things. First, the reduced transparency of the rain-covered windscreen which causes the eye to indicate a horizon below the true one (because of the eye response to the relative brightness of the upper bright part and the lower dark part) and second, the shape and pattern of the ripples formed on the windscreen, particularly on sloping ones, which cause objects to appear lower. The error may be present as a result of one or other of the two causes, or of both, in which case it is cumulative, and is of the order of about 5° in angle or about 1 in 12. Therefore, a hilltop or peak one - half mile ahead of a plane could appear to be 200 feet lower as illustrated below.



Pilots should, therefore, bear in mind this additional hazard which exists when flying in conditions of low visibility in rain and should maintain sufficient height and take other precautions as necessary to allow for the presence of this error, to ensure proper terrain clearance during enroute flight and on final approach to landing.

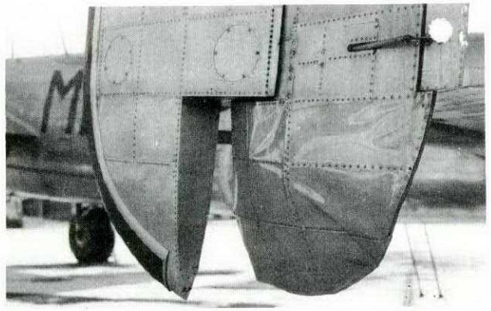
Tests have shown that these errors can be reduced and vision improved by the use of rain repellant. Persons desiring further information regarding the use of rain repellants may obtain such information by writing to the National Research Council, Division of Applied Chemistry, Ottawa, Ontario.

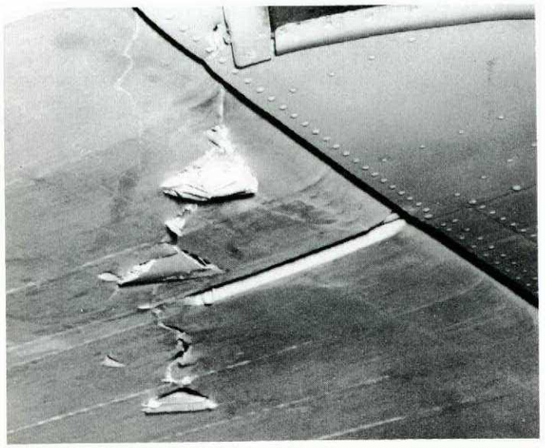
DOT CIRCULAR O/61/48

The snowbank season is here with us again, when wing tips and tail sections come in for a lot of bashing and bending as these photos illustrate. Even without snowbanks, mules, starters, heaters and assorted ground equipment exact their toll.

Accidents of this type are avoidable and whether being taxied or towed into position, aircraft should never be allowed to bash their extremities on such obstructions.

Increased supervision and constant alertness at all times, particularly in snowy wintry weather, will eliminate these accidents.





DFS LIBRARY
LIBRARY COPY - this pub must be returned.

ARRIVALS and DEPARTURES

Resumes of accidents are selected for their interest and the lessons which they contain. The time required to complete the accident investigation and the additional time necessary for publication generally totals six months.

BY THE BOOK

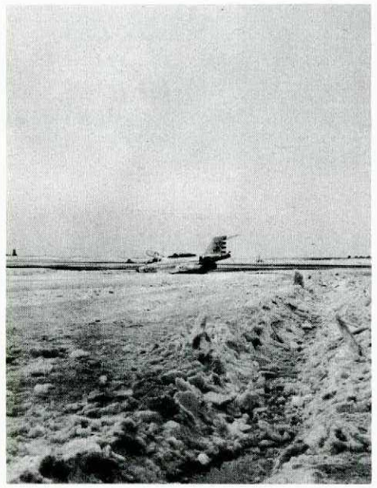
A Voodoo pilot joined the circuit to practise a full-stop simulated single-engine approach. His circuit and approach were faultless; speeds, power settings, use of flaps, were all perfect—but he made one mistake; he flared out before reaching the threshold of the runway, and the aircraft touched down about 75 feet short in about 18 inches of granulated snow.

Force of impact sheared off the port main landing gear. The Voodoo skipped onto the runway, touching down about 100 feet beyond the first impact point. The pilot attempted to keep steady as long as possible, but the aircraft settled gradually onto the port wing and veered off the runway, shearing the nosewheel gear.

Technical investigation revealed no maintenance, technical, or materiel failure. This aircraft has a high sink rate as a result of its very high wing-loading. It depends on its engine to fly. Consequently, power must be kept on after flareout, and the aircraft must be flared out over the runway.

The squadron commander thought the pilot might have been over-confident, and might have been experimenting. If so, his experiment proved that the book is right. The landing wasn't hard and the pilot had no clue that he had damaged the aircraft until the port wing began to drop.

The squadron will now give detailed briefings on aircraft-handling during the first fifteen flying hours on the squadron. Moreover, Command thinks that severe action on this kind of lapse is warranted. The moral is clear: Fly by the book.

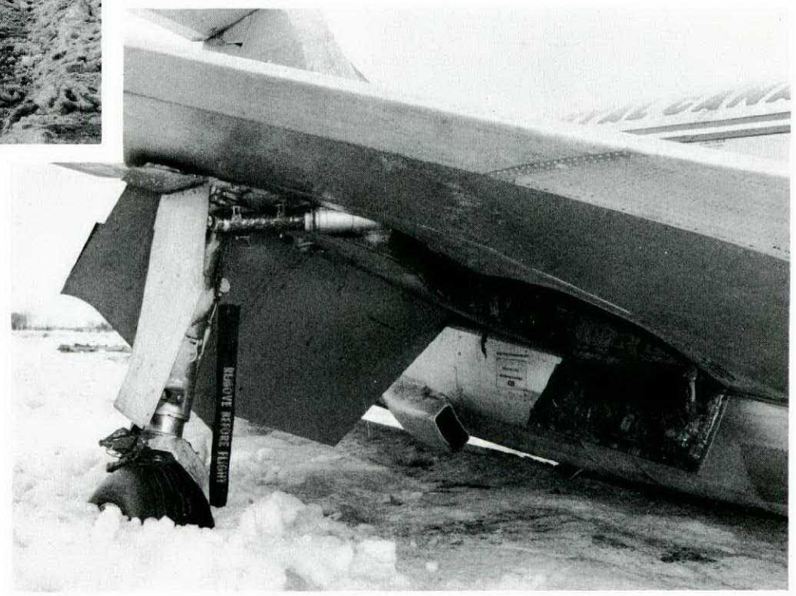


TRIM SWITCH MALFUNCTION

During a local training flight, while the aircraft was turning to the left, sudden pressure was felt in the controls causing the aircraft to bank to the right. The auto pilot was checked off and manually disengaged. Considerable pressure was required to return to level flight and it was then discovered that full right trim had been applied, although the trim switch had not been operated. Trim was neutralized, and the aircraft returned to base.

The electrical technician found the trim switch had fractured and shorted out, causing full trim to be applied. A UCR was raised and action has been taken to ensure more frequent inspections.

"THIS IS ACCIDENT PREVENTION"



IF THERE IS ANY DOUBT—DON'T

An Otter captain was detailed for a training-transport exercise to a small civilian airfield near a town. Upon arrival, he was unable to locate the airfield and proceeded to another, close by. This one was found unsuitable for use because of the wind conditions at that particular time.

The pilot returned to his original destination and selected a farmer's field for landing. Surveillance from the air showed that while a landing appeared possible there were some hazards, including an old fence line. On final approach it was noted that the ground sloped away from the aircraft and touch-down occurred farther down field than anticipated. The aircraft rolled over the old fence line and the tail wheel was broken off when it struck a large rock 10 inches high, obscured by grass.

The unit commander found that adequate preflight preparation had not been done, in that the pilot failed to obtain all the details concerning his destination. Furthermore, the captain should not have landed in such a field as he knew hazards existed. He was awarded a reproof and removed from his position as flight commander.

IT WAS A FROSTY FRIDAY

An Otter was assigned to do an ice check on a lake. The aircraft touched down on the ice, overshot, and came round again. After a hasty perusal of the tracks from half a mile away, the pilot landed to the west of the initial spot. On the runout preparatory to a "racetrack" taxi path to a stop, the crewman and second pilot noticed water rising in the ski-tracks. Despite their shouted warning and the application of full power, the Otter wouldn't accelerate, and sank through the ice. The six persons aboard evacuated safely.

Primary cause was assessed as inadequate briefing. The captain had little Otter experience, and not enough ski instruction to carry out a proper ice evaluation. Briefing by the squadron commander was inadequate and confused, and did not specifically designate that the captain do the check.

Ice on the lake had been reported unsafe by a provincial government agency. A local resident had suggested a place of probable safety, but the pilot didn't land there.

Another unit had first agreed to do the check, but was prevented from doing so by a search operation. Despite this, and the reports of poor ice conditions, the squadron commander decided to proceed with the operation.

In future all operations orders in this command will include specific instructions for ice checks. Necessity for complete and specific briefings has been stressed. The squadron commander, was interviewed by the AOC, and the pilot was administered a reproof.

DFS LIBRARY
LIBRARY COPY - this pub must be returned.

IT'S AN ILL WIND

An Otter aircraft returned to the aerodrome to carry out some practice short-field landings and takeoffs. Two circuits were done and on the third approach, just before touchdown, the aircraft ballooned 20 feet as the port wing rose and the aircraft turned port 20 degrees. Power was applied and the engine was over-boosted in regaining control of the aircraft. Although no damage was apparent the engine was replaced as a precautionary measure.

The cause of the accident—the prop wash of an Argus aircraft doing a full-power runup while directing the air flow across the button of the runway in use. Equal blame was apportioned to the Otter pilot who should have exercised better airmanship and realized the potential hazard of the Argus propellor wake in his intended landing area.

Lastly—the tower personnel should have cautioned the Argus captain about his choice of runup area, and warned the Otter captain of the possible danger.

Remarks on the D14 allocated some share of responsibility to both captains and tower personnel.

Letters to and from the Editor are not official RCAF correspondence, and need not be directed through official channels. Unless otherwise stated, statements in letters and replies should not be construed as regulations, orders or directives.

Dear Sir:

The fact that I am an aircraft bender from a way back and thus more of a spectator than a participant in this flying business, does not deter me from reading your interesting and beneficial magazine.

I do have one complaint, and that is, the distribution of copies is much too conservative. Limited copies necessitates circulation through numerous offices with the inevitable result that often months go by when I do not see a Flight Comment (because some pack rat like myself, likes to keep it in his desk to read during non-peak hours).

May I suggest, Editor, that you increase the distribution.

(W. P. Maquire)
Squadron Leader

RECOMMENDED READING

Volumes of flight safety literature cross our desks in AFHQ but lack of space in Flight Comment prevents us from giving all of this literature the credit it deserves. There are two outstanding features, however, which deserve special mention.

Read 'em or Weep—by Ralph McReadie of the GE Company in USAF Aerospace Safety, May 1962

In this story of interest to both air and ground personnel, Mr. McReadie discusses the importance of engine instruments, their interpretation, and the message they give to pilots.

Soldering—Boeing Aircraft Company in USAF Maintenance Review, April 1962

Technicians may pick up some worthwnile facts on the techniques and problems of soldering. In addition, much general information is included in the article which provides valuable background knowledge for aircrew.

All flying units in the RCAF receive copies of these magazines. Sometimes they are spread quite thin—but we suggest that you take the trouble to find and read these two articles.

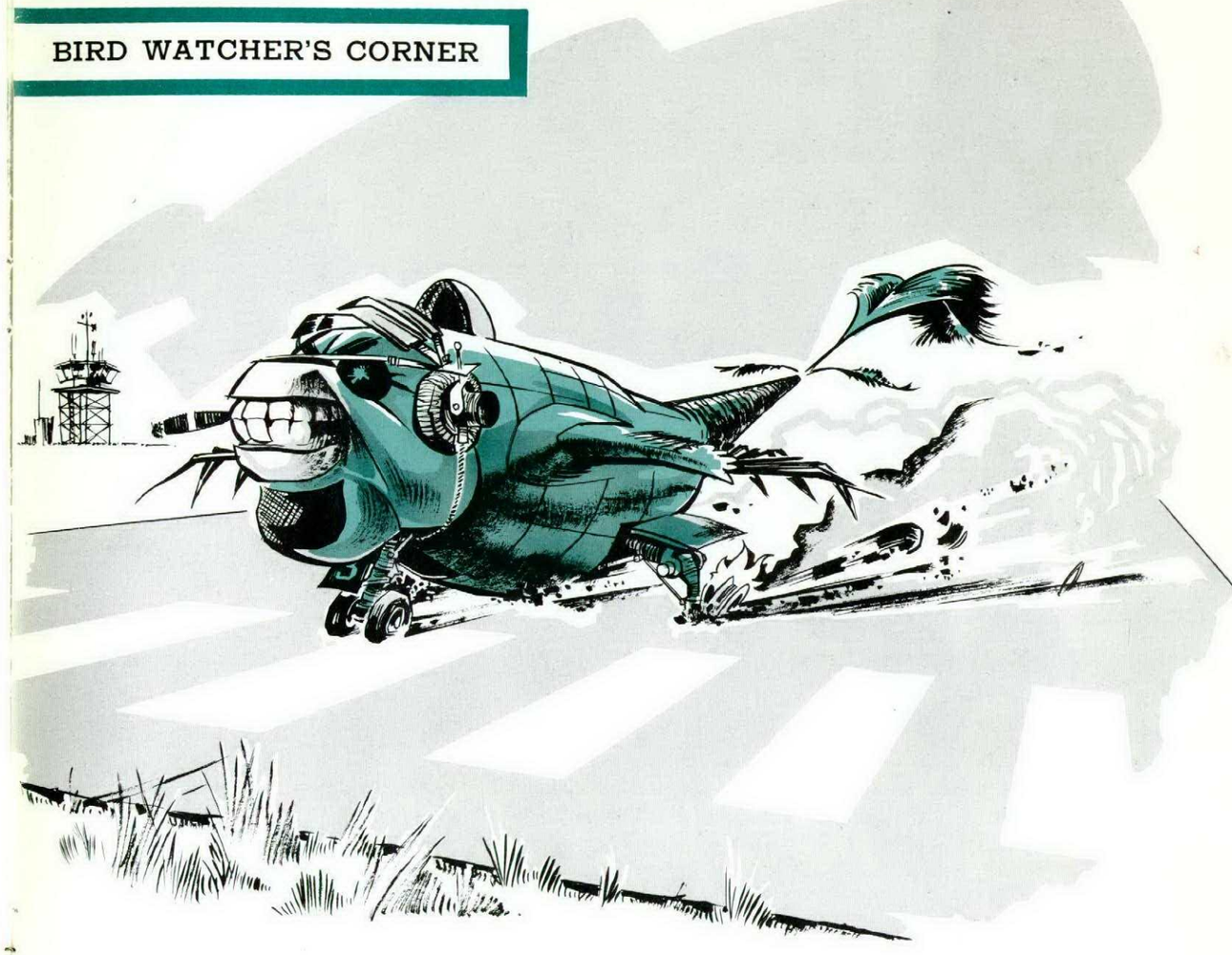
Along the same general line—anyone who flies over or goes into the bush for outdoor sport should read the following article:

A New Way to Find Direction—by Robert Owendoff in Field and Stream, January 1962

ROGER DUHAMEL, F.R.S.C., Queen's Printer and Controller of Stationery, Ottawa, 1962

Contributed by: F/L J. J. B. MacDonald

BIRD WATCHER'S CORNER



"BANDY-LEGGED BRAKE-BURNER"

This awkward, ungainly bird can be seen perched, blithely moulting and shedding its lower pin feathers, upon return to its roost.

May be readily distinguished by the charred, scorched, appearance of its shanks, most prominent shortly after alighting.

It has a variety of wailing calls and cries, the most prevalent being:

MUSTAHITANICYPATCH
MUSTABINAWINDSHIFT
MUSTAHADABRAKEJAM

This genus of bird comes in all shapes and sizes. Only one species has not offended—the whirly-bird.

DFS LIBRARY
LIBRARY COPY - this pub must be returned.

CONTENTS 1962

January . February

March . April

May . June

July . August

September . October

November . December

Congratulations to the 1962 FSO Course
All success in your endeavours.

M. Brault
DFS/AFHQ