FLIGHT COMMENT

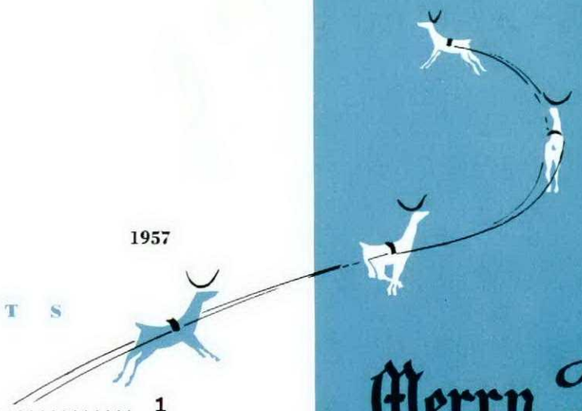
NOVEMBER · DECEMBER · 1957

FLIGHT COMMENT

DIRECTORATE OF FLIGHT SAFETY
R.C.A.F. HEADQUARTERS • OTTAWA, CANADA

NOVEMBER DECEMBER 1957

C O N T E N T S



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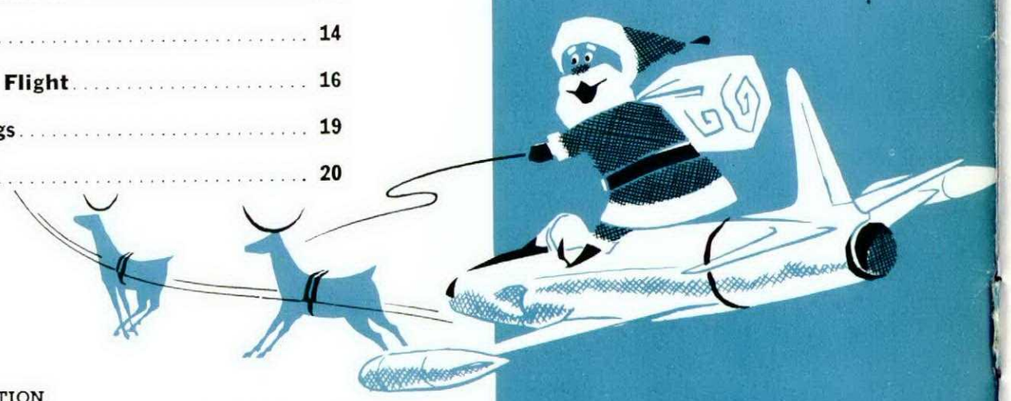

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EDMOND CLOUTIER, C.M.G., O.A., D.S.P., Queen's Printer and Controller of Stationery, Ottawa, 1957

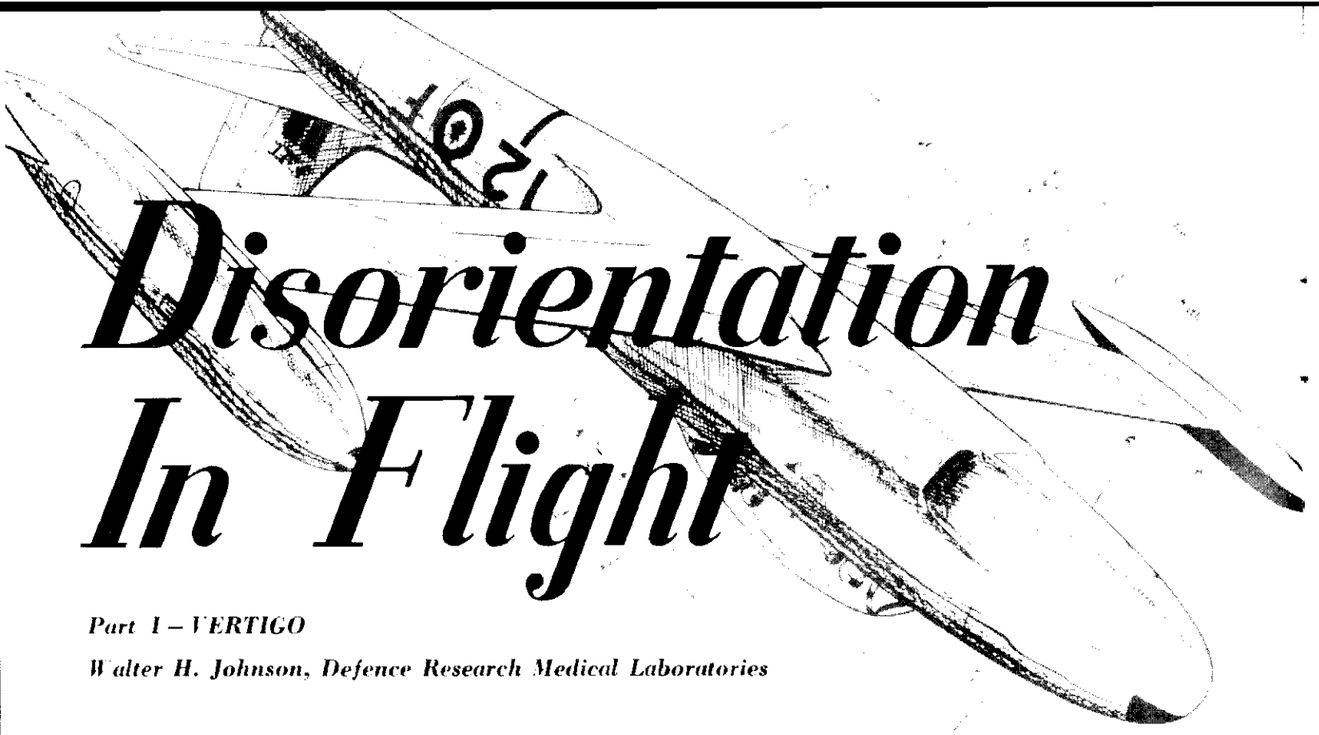
C/CPL H.C. HELOIR

Cadet-Corporal Heloir, a French Air Force NATO student, was returning to base in a Harvard from a solo night navigation exercise following his dual night checkout. At about 400 feet above the ground on his final approach he was instructed by the controller to go around again when traffic did not clear the runway as expected. He applied power and the aircraft levelled out at about 300 feet.

At this point there was a loud bang—audible indoors even a mile away—and the aircraft began vibrating badly. Realizing that he had a partial power failure, the pilot raised the undercarriage and then declared his predicament, stating that his manifold pressure was 32 inches, pitch full fine and rpm approximately 1500. The Harvard was losing speed and would not climb, but the pilot eventually got it setted down in level flight at about 200 feet and with partial power at between 55-60 knots. His flaps were still down at 45 degrees and he now felt they could not be retracted safely.

The tower operator finally requested confirmation of pitch setting and suggested a check of the carburettor heat control which was in the cold position. Then the circuit was cleared of all other traffic and C/Cpl Heloir made a 180-degree turn which put him on the downwind leg at about 150 feet above ground. After another 180-degree turn he lowered the undercarriage and landed safely on the runway in use. Examination of the aicraft revealed a propeller failure.

C/Cpl Heloir is to be commended for demonstrating good airmanship under considerable stress at night.



Disorientation In Flight

Part 1 – VERTIGO

Walter H. Johnson, Defence Research Medical Laboratories

Research in aviation medicine is currently focusing considerable attention upon the subject of vertigo. The reason for this emphasis arises from the fact that vertigo is a distressing and dangerous condition which may occur during various types of manoeuvres—frequently with fatal results.

Flight safety statistics show it to be a major cause of "pilot error", and its dangers have even been brought to the attention of the public through articles in popular publications. Many of these articles unfortunately have left the impression that vertigo is a hazard about which little is known and about which little can be done to prevent its occurrence.

This general lack of understanding also appears to be rather prevalent among aircrew, as indicated to the author recently during interviews with pilots of various RCAF commands.

It is therefore the writer's aim to clarify the exact meaning of the term "vertigo", and to indicate that it is a condition which will occur in all normal persons under the proper circumstances. By recognizing the causes from which it develops, and by taking specific measures to minimize vertigo's disabling effects, it should be possible to reduce the number of accidents directly attributable to this source.

What is Vertigo?

The term "vertigo" is a scientific expression with a specific meaning. Like many other medical terms it is derived from a Greek word meaning "the sensation of rotation or whirling around". This actually implies a subjective sensation either of the subject rotating with respect to his surroundings, or of the surroundings rotating with respect to the subject. Vertigo is thus a dynamic form of disorientation which results in a false sensation of motion. Another form of disorientation, to be described in a later article, consists of a static condition known as "spatial disorientation" which gives one the illusion of being in a false position with respect to the earth's surface.

How it Affects You

The real hazard to aviation stems from the fact that the sensations of rotation which arise when vertigo exists are misleading in that the subject may continue feeling them when he resumes straight and level flight immediately after a turn or spin, thus experiencing a false sensation of a turn in the opposite direction. A pilot may have the same impression while the aircraft is actually turning, of course, but the sense of direction of rotation imposed on him may be in a plane of space quite different from that in which the aircraft is actually moving. Under these circumstances a pilot is strongly tempted not to believe his instruments—with the result that he may take the wrong corrective measures.

A condition of extreme vertigo may even develop to such an extent that the instrument panel appears to move, making it difficult for the pilot to take a reading. This phenomenon was experienced by the author on his first flight in a T-33 when the aircraft was suddenly levelled off after a power spin.

Sensations of false rotation are to be expected since they are the natural consequences of our being endowed with specialized sense organs in the head, the function of which is to perceive changes in the rate or direction of rotation (angular acceleration). Normally (on the ground) this is a desirable asset, enabling us to maintain our equilibrium. However, when we are exposed to relatively rapid rotations, the body tends to overcompensate, with the result that we lose our equilibrium and fall, the direction of the fall depending upon the direction of rotation.

This disturbance can be especially severe when the organ of balance in the head is exposed to angular accelerations occurring in more than one plane simultaneously (e.g., if the head moves in one plane while the body rotates in another). Furthermore, the rate at which the head is moved determines the magnitude of the resulting sensations of false rotation: the faster the head movement, the more severe the effect. Movement of the head in the same plane as that in which the rest of the body is rotating does not have such a severe effect in producing vertigo.

Equilibrium and Gyroscopes

The organ of balance in the head thus acts like a gyroscope which precesses (or tumbles) in the third plane of space when, while rotating in one plane, it is tilted in a second plane at right angles to the other two. In fact, our balance organ actually resembles a gyroscope in appearance, as can be seen from the accompanying figures. As shown, the organ consists of three semicircular canals, one in each of the three planes of space and almost at right angles to each other. The organ contains fluid which can flow inside the canals just like the spinning wheel of a gyroscope. If one's head should rotate in one plane of space, the contained fluid is set in motion in the corresponding canal. If the head is then moved simultaneously in one of the other planes of space, the fluid in the second canal commences to rotate. Finally, the rotation of fluid in these two canals will start a violent flow in the third, even though the head isn't moving in that plane. The magnitude of the fluid movement in this third canal is the product of the other two; hence it is the canal in which the greatest fluid motion actually takes place.

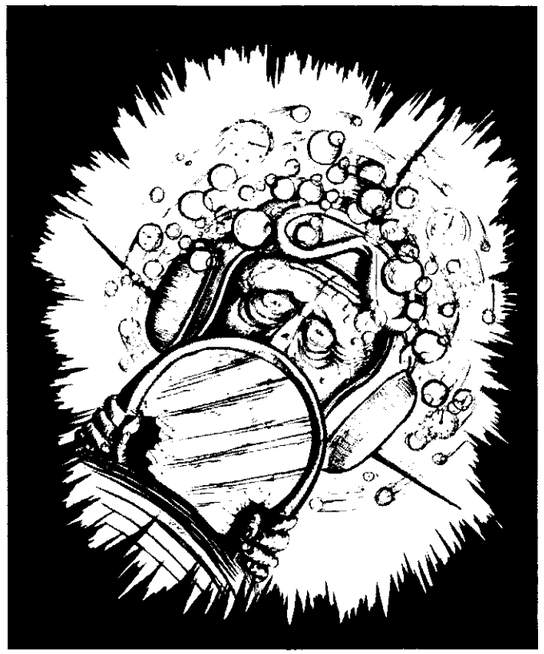
Each canal contains delicate nerve endings which are sensitive to the movement of the contained fluid. The brain receives messages from these endings and responds to the canal emitting the most powerful sensation of rotation—the third canal, located in the plane of space in which no rotation actually took place! When this occurs to the pilot of an aircraft, it constitutes a dangerous hazard.

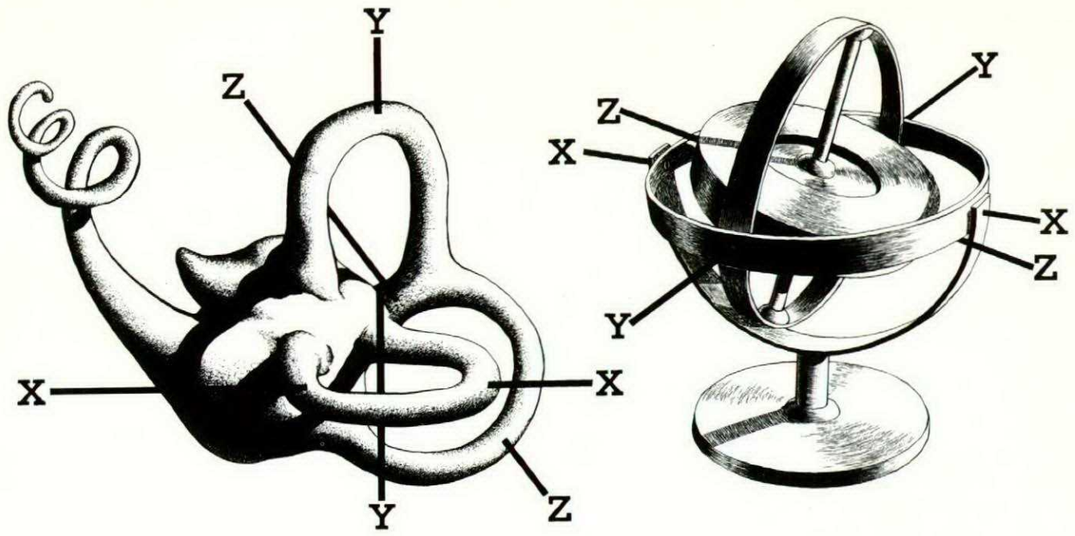
The Illusions it Creates

We should point out here that the real reason why a person experiencing vertigo actually "sees" surrounding objects rotating (e.g., the horizon, his aircraft, or the instrument panel) is because the nerves from the brain actually cause the eyeballs to rotate or oscillate whenever one of the canals of the organ of balance is being activated by the movement of the contained fluid. This is a subconscious oscillation of the eyeballs called "nystagmus" by the medics.

Nystagmus consists of a series of relatively slow movements of the eyes in the same plane occupied by the canal in which the greatest movement of fluid takes place; and each of these movements is followed by a quick recoil of the eyes in the opposite direction.

This eye oscillation may last long after the head movement which produced the vertigo has ceased, its duration depending upon the sensitivity of the nervous system of the person concerned. The illusion of rotation, either of the pilot or of surrounding objects, is due to the fact that the image of whatever he is looking at actually does move across the back of the eyes due to their oscillation. Since the image is only perceived by the brain during the slow phase of nystagmus, surrounding objects then appear to rotate continuously in one direction and not back and forth. The effect is somewhat like that seen in the movies, whereby the projection of a series of successive still pictures on a screen creates the illusion of continuous movement simply because the pauses between pictures appear for too short a period of time to be perceived by the eye.





Dummy Runs

Illusions of rotation can be easily demonstrated on the ground, and it is strongly recommended that all aircrew become thoroughly familiar with vertigo by means of a simple procedure which can be conducted easily and with safety. First, have someone rotate you on a piano stool. Notice that, with the eyes closed, if the head is kept still in its normal upright position, constant speed of rotation will produce little or no sensation of rotation. However, any change in rate of turn—including the beginning and especially the sudden cessation of rotation—will produce nystagmus in a horizontal plane, and you will definitely experience a sensation of rotation in the opposite direction even though you may be stopped altogether.

You will also experience a still more violent sensation of vertigo if, while spinning (or immediately after stopping the spin), you should look sharply upward or downward. The result is a violent nystagmus of the eyes in such a direction that you will feel yourself to be tilting sideways and downward and be completely unable to maintain your equilibrium. Again, if you quickly tilt the head to either side while spinning on the stool, you should fall either backward or forward, depending on whether you tilt your head to left or right. In any case you will probably fall to the floor, with embarrassing consequences.

Such antics are the basis of an old mess trick which you will probably recognize. In any case, it is well worth your while not only to experience such embarrassment but to watch others in such a predicament. Be certain to examine the subject's eyes while he feels this dizziness and you will readily appreciate what is meant by nystagmus. Try superimposing head movement very slowly and you will notice that the resulting vertigo is lessened. Remember, these are normal responses which can happen to anybody.

Cases in Point

When vertigo occurs in the air, it is a serious hazard, but can be avoided. A few examples are worth recalling.

A T-33 aircraft was flying at 35,000 feet from Winnipeg to Trenton at night. Letdown was made over Muskoka in cloud. Suddenly the pilot felt as if he had banked to the left at 60 degrees. His instruments showed, however, that he was straight and level. Further letdown gave him the impression he had done two rolls to the right, although his instruments showed a normal letdown. The impression was so strong that he turned right instead of left on the approach, and the copilot had to take over.

A C-45 aircraft was on a night navigation training flight from Winnipeg. The sky was clear, there was no moon, but the stars were quite bright. Snow covered the ground, and the area was uninhabited, with no lights anywhere. The pilot did a 270-degree turn (30 degrees of bank) and after levelling out quickly he glanced through the side window. The whole sky immediately seemed to rotate and the stars appeared briefly below. He went back onto instruments, which indicated straight and level flight, and stayed on them until the sensation disappeared.

A formation of 12 RCAF Sabres were flying in three sections of four aircraft each on a gunnery exercise in Europe. The weather had been CAVU for the two previous weeks. Descent to base in France was made with a "teardrop" letdown. Solid cloud was evident from 1000 to 30,000 feet and it was raining. All the pilots involved reported various disorientation experiences on the letdown. Pilots in the Number Three position in each section were exposed to conditions most likely to produce vertigo because they had to glance quickly at the leader on their left, the wing man on their right, and then back to instruments, while performing turns on letdown through cloud. One man reported a false sensation of several slow rolls. Spatial disorientation was also reported, one wing man claiming to have experienced the sensation of flying inverted, while another stated he thought he was looking down on the leader when he was actually above him.

A T-33 aircraft based at Uplands was on a night flight at 0200 hours. At 38,000 feet the sky was clear, with bright stars and Northern Lights. The pilot did a letdown, with turn, to 24,000 feet. During the turn he moved his head to look away from the instruments. Immediately he experienced a violent sensation of vertigo, the sky rotating about him so that the stars appeared (subjectively) underneath the aircraft. The pilot temporarily lost all control in the resulting confusion and could only right himself by holding the control column with both hands and concentrating his attention on the instruments. The copilot in the back seat underwent similar sensations which he was only able to overcome by flying under the hood and on instruments. Both pilot and copilot were visibly shaken by the experience and later credited their survival to concentration on the instruments.

In conclusion, it should be emphasized that vertigo can happen to any normal person, and that all aircrew can expect to experience it sometime. Try to understand why it occurs—and respect its existence as a hazard which you can overcome quickly by focusing your eyes intently on the instruments.

Remember above everything else that vertigo—like any other emergency—can be best overcome by being in good physical condition and well rested.

BOOBY TRAPS

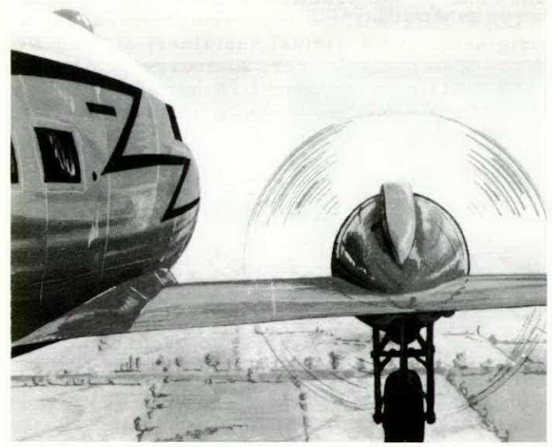
There are many kinds of booby traps, each with its own brand of come-on. But there's one special type that has a particular allure for pilots. The Air Force calls these traps "Sucker Holes" and reports on one this way.

One is the hole that appears during the GCA final to a field with a low ragged ceiling. At about 600 feet you suddenly break out and see the ground over the nose of your plane. The runway is still obscured by clouds, but you can see the ground lights and so you decide all you have to do is duck under the cloud up ahead and go in, contact.

Down goes the nose in a pushover, then a small turn to avoid that one low-hanging precip cloud and ...wham! You're in the stuff again. What you didn't count on is the fact that the cloud you ducked under hides other clouds that go right on down to the deck! You're back in the soup before you have time to readjust to instruments. Involuntarily, you haul back on the stick to put a little more room between you and the field because you haven't even had time to remember the field elevation and correlate your altimeter reading with it. There you are.. nose high, airspeed and altimeter low, and GCA yelling at you to go around unless you have the runway in sight...

You're in a bind and one that has booby-trapped a lot of pilots. You read about the unlucky ones. Moral of this predicament is, don't be sucked in by a hole in a low, ragged ceiling. Stay on GCA until you have to concentrate your full attention on the actual runway touchdown. And when you do break out somewhere on final, use your visual reference to the ground as though it were another gauge in the cockpit, and one to be cross-checked in its right relationship to the other gauges. This procedure is a good defense against vertigo, too, and it's easy to get vertigo in a situation like this.

Flight Safety Foundation



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LETTERS TO THE EDITOR

Apology to T-33 Users

Training Command was quick to catch an error we made on page 13 of the Jul-Aug Flight Comment. Our editorial footnote on the auto-rip connection obviously did not apply to T-33s. We should have stated that our reference was directed only to Sabres and Canucks.—ED

So-Long and Good Luck

Flight Safety is a man short through retirement. S/L W. "Bill" Clark served almost four years with the Directorate of Flight Safety at AFHQ. In his capacity as a supervisor in Flight Safety Education, "FS2-3" was honorary pall-bearer when "Crash Comment" died—and fussing midwife when "Flight Comment" was born.

An excellent pilot himself, S/L Clark did much, both by precept and example, to promote the concept and practice of Flight Safety in the RCAF. He will be best remembered as the originator (and virtual sustainer) of the BWC (Bird Watcher's Corner, of course!).

Whatever he turns his hand to in "civvy street", we wish him plenty of luck, no flap, and happy landings.—ED

Wheels: Up or Down?

A large number of American magazines dealing with aircraft and flight safety are read by RCAF personnel, pilots in particular. These magazines, for the most part, are very interesting and well received.

One point arises that perhaps could be clarified by DFS. Some of the flight safety procedures used by the USAF are not accepted by the RCAF, and some comment on these should be made by DFS. For example, the USAF recommends that, when crash landing in aircraft, the undercarriage should be left down to absorb some of the shock. The RCAF says to go in wheels up. Pilots reading the multitude of magazines they do might assume that the RCAF had now adopted the USAF procedure. If they then followed that procedure, they would be open to castigation for disobeying an order.

Could DFS review American magazines on flight safety? If discrepancies were discovered, a note could then be circulated to the flying units urging personnel to continue with RCAF procedures and not become confused.

M. F. Chapin, F/O
Flight Safety Officer
RCAF Station Sea Island

We are pleased to hear that distribution of American publications on flight safety is effective and that these magazines are being used. It is probably true that procedures vary between the USAF and ourselves—but after all, they have been developed by different Air Forces. The important point is that we both have the same aim in life: the preservation of lives and aircraft.

The USAF publication, Flying Safety (February 1956), carried an article entitled "Down Boy Down" which dealt with the merits of wheels-up versus wheels-down forced landings. It aroused considerable interest in the RCAF, but a survey of our own accident statistics on this type of landing failed to bear out the USAF conclusions. While the wheels-down configuration is quite acceptable in some circumstances, our experience indicates that it may not be so in all of them. Bear in mind as well that the USAF procedure applies only to tricycle undercarriage jet fighters, and not necessarily to all aircraft. The RCAF policy on the wheels position is that it should be left to the discretion of the pilot. A mandatory policy may not be the best one in this case.

Insofar as your third paragraph is concerned, although the publications made available are for digestion by everyone involved in the operation of aircraft, they do not constitute orders which are found elsewhere. The magazines referred to carry thought-provoking material and hence serve a useful purpose. So don't be led into confusion because everybody doesn't think the same way. An order to the effect that such and such an idea in a magazine is not worthwhile and that RCAF instructions or POIs for an RCAF aircraft should be adhered to would hardly be correct or even necessary. The thing to do is simply to follow the latest RCAF instructions —ED

COVER OR CAGE?

How many times, when you've been standing in a bar chatting to your fellow aviators, has the conversation taken a macabre turn? You know—horror comic stuff: "There it was, blazing away, and the pilot couldn't get out...." Not a pleasant topic, fortunately not a common occurrence; but it does happen once in a while. We have just been reading the USAF Maintenance Review, and it gives two examples of the type of situation which might face you, or anybody else, at a moment's notice.

In the first case, an F86D crashed immediately after a takeoff, right beside the married patch. It caught fire, but several assorted rescuers went in and got the pilot out alive, though both they and he were singed. The rescue took time; they were not pilots, and did not know how to undo the various harnesses.

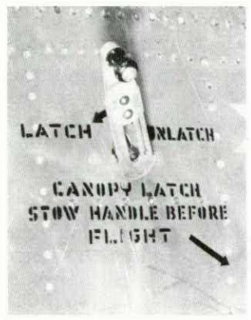
The second example was more tragic. A T-33A crashed, again soon after takeoff, and sat in a field all-of-a-piece, but with the pilot unconscious. Three airmen, all familiar with the type, arrived on the scene and tried to open the hood. They did not know how to do this from the outside, so despite advice to the contrary, pulled the emergency jettison cable which blew the hood clear by an explosive charge. The aircraft and the fuel-soaked surroundings caught fire and the pilot was burned to death.

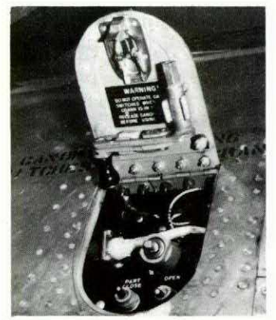
The moral is clear. If people know how to get the hood off a crashed aeroplane, and how to undo the safety and parachute harnesses of the crew, they may be able to save lives. To try and train every adult of sound mind and limb would be rather an ambitious program, but you will probably have seen policemen and visiting firemen poking around your hangars from time to time, getting the "gen". That's a good start, but how about your own airmen, and NCOs and Officers? Does the Education Officer know how to open the hood of your Vampire from the outside? He should, because he might be the first person to arrive on the scene.

If an aircraft is going to come to grief, it stands a 1-in-5 chance of doing so on or near the airfield, in which case there's a 5-to-1 chance that the crash crew (the professional rescuers) will be first on the scene. Its that odd chance that counts. For example, we had a Hunter force land in the circuit of one airfield last year, and though it could be seen from the control tower, it could not be approached by road. Fortunately the pilot was not severely injured and the crash did not burn; but that's the sort of unexpected situation which sends "agley" the best laid plans.

Here's the proposition then. Since a goodly proportion of crashes happen on or near the airfield, you may suddenly find yourself alongside a smouldering aeroplane. It would help if you knew how to get the hood off, and how to release a crew member. You might even be that crew member!

RNZAF: Flying Safety Review





T-33 Canopy External Unlocking Crank
Mod. EO 05-50C-6A/158 24 Oct 56

BAGTOWN BLUES

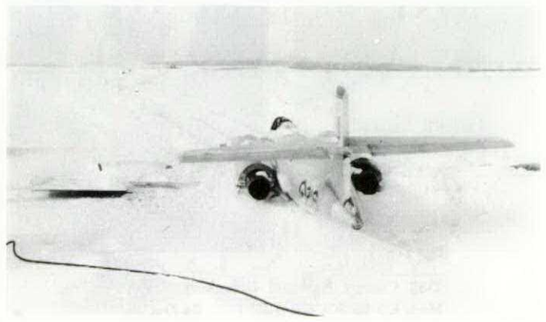
S/L H. H. CAMPBELL

The oldest European trading post in Canada, Tadoussac, lies at the mouth of the Saguenay River on the north shore of the St. Lawrence. The Saguenay—more fjord than river, with treeless, thousand-foot-high rock walls—was a traditional water route of the Algonquins moving into and out of Central Quebec. (They moved out in winter.)

Later, with the dispossession and decimation of the Algonquins, came the French settlers who formed that partially self-governing community known as the "Kingdom of the Saguenay". The Kingdom has its own flag and its own traditions—and its daughters play for keeps.

Midway between Lake St. John (a 365-square-mile basin in the Pre-Cambrian shield) and Tadoussac at the mouth of the river, a bay juts southward, like a derisive thumb. The bay is named "The Bay of Ha Ha". It points towards RCAF Station Bagotville. (It seems to point even more towards RCAF Station Bagotville in winter.)

The Saguenay is one of the country's more active waterways in summer. A tremendous tonnage of shipping services the world's largest aluminum plant at Arvida and the almost equally impressive pulp industry along the river. From June to September pleasure steamers ply briskly to and fro between Chicoutimi and Port Alfred, while aircrew proceed in a similarly brisk manner to the same points in order to ply such unattached female tourists as evince

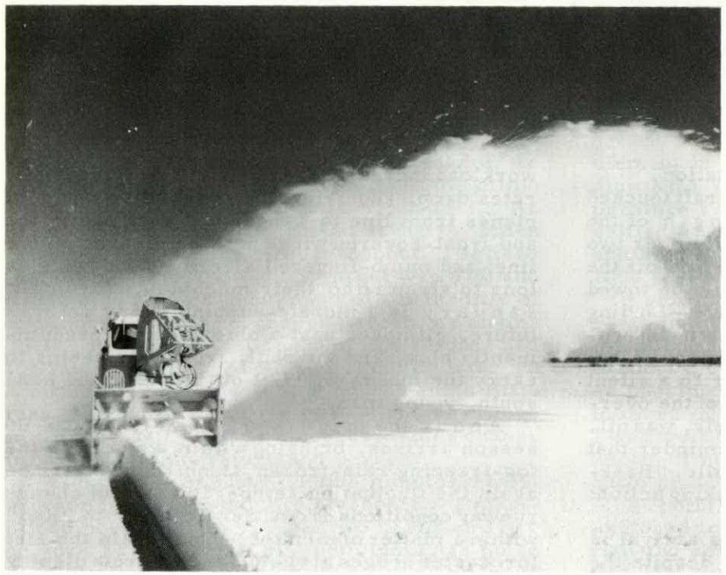


an interest in local custom.

In late September the pleasure steamers make their final trips of the year and mess attendance picks up. Shortly thereafter the river freezes over, the wedding season is declared open, and the siege is on. So much for history. Now, what about the weather?

Each "Bagtown" winter in recent years has vied with its predecessors in the production of disagreeable weather. The winter of 1955-56 was notable for exceptionally high winds, record amounts of snow, and the nervous breakdown of the CE Officer. On the credit side, bar profits were good. Last winter, 1956-57 saw no less than four earlier records shattered. These were (in order by months) as follows:

- December was the coldest on record
- January was ditto
- February was the warmest in the annals—producing thereby more freezing rain than ever before
- March created a new mark



in the fog department
- April behaved fairly well. (Credit. where credit is due.)

To counter these inclemencies, Stn Bagotville has a complete and well tended stable of modern snow removal and other heavy weather equipment. The operators of these fine machines bow to none in the departments of skill and experience. It might almost be said that no operator is fully experienced who lacks the background of a winter in "Bagtown". Directing these operators are, (self-)admittedly, some of the finest brains in the Command.

"How then," you ask, "can the vagaries of weather in Bagotville pose any great problem?" The answer is that individual attacks of snow or rain or of freezing rain can be taken in stride. The head-scratching starts with combinations of any two or of all three types of precipitation. Add rapidly fluctuating temperatures, a soupcon of fog and deteriorating alternates, and the problem warrants the use of strong language and/or drink. (After the job has been done, of course.) But how to do the job?

A snow covered runway can be cleared in a matter of minutes. Obviously, if we have a snow covered runway, the shot is to pitch right in and clear it off. Then, if the snow is followed by rain, we won't have a slush covered runway—or worse, a rutted, jagged-edged, frozen-slush runway. Obvious, isn't it?

But perhaps the follow-up will be freezing rain. Who knows? The Met forecaster? Sometimes. If the freezing rain comes, the freshly cleared runway will have been perfectly prepared for construction of an 8000-foot skating rink. Had the protecting snow cover been left on the runway the airborne Canucks could land with fair to good braking action, and later the ice-encrusted snow could be whipped off by the plows. Evidently the answer to the question "To clear or not to clear?" is not always a simple "Get cracking with the plows!"

There can be no set formula for keeping runways clear and braking action good during the freeze-up period. Most of the time, only the closest cooperation between Engineering, Meteorology, Flying Control and the aircrews can produce these conditions. The remainder of the time contains inherent gambles, the winning of which requires the prescience of an armchair quarterback or the use of an educated coin. Since both are readily available from the other squadron on this unit, it would seem that Station Bagotville should have all situations taped.

Unfortunately this is not always the case. Occasionally the threat is not discernible prior to its arrival at "Bagtown"—as witness the occasion last winter when, with five Canucks airborne, the alternate aerodromes clamped in unexpectedly. Bagotville remained well above limits until the pilot of the first returning aircraft commenced his GCA. At this point

a freezing rain squall struck the station.

Engines flamed out, the first aircraft touched down and slid ponderously the length of the runway—and off the end of 11. Number two landed in the opposite direction and slid off the end of 29. As fast as aircraft could be towed clear, numbers three, four and five—landing in opposite directions—touched down and revolved along the runway like so many 17-ton curling stones, finally coming to a silent ignominious halt in the deep snows of the overshoot areas. The damage, fortunately, was nil. But the incident served as a reminder that within five minutes at Station Bagotville, "Braking action: GOOD" can become "Braking action: NIL".

When winter proper sets in, its arrival is almost a relief to the aircrews, despite the miseries of strapping into cold aircraft in 30 below temperatures. Winter weather is easier to predict, threats of fog and freezing rain virtually disappear, and (generally speaking) runway conditions improve.

For groundcrew, on the other hand, winter is a difficult period. At a time when working out of doors is least desirable, the outside workload increases: aircraft serviceability rates drop, requiring the constant towing of planes from line to hangar and back again; ice and frost-covered wings must be cleared on the line; and numb-fingered aircrew take twice as long to strap into their machines. All in all, January is a morale-sapping month. The future, glimpsed past a blue nose, is predominantly blue, and the still, frosty air seems to carry the message, "Get out of here and head south, young man."

About the middle of April the break-up season arrives, bringing with it a return to the fog-freezing rain-frozen slush routine. Once again the fluctuating temperatures can change runway conditions from "Serviceable" to "Red" within a matter of minutes. Once again the Met forecaster hedges his bets, and aircrew display increased interest in the latest sequences. But although ceilings and visibilities may be lowering, spirits are rising.

For there is a promise of spring. Soon the harried purser of the "SS Richelieu" will be counting leftover hats in the cloakroom at midnight and trying to recall whether he saw any hatless officers departing down the gangplank.

S/L Hugh H. Campbell was born in Toronto in 1916 and educated in England. He completed a tour of operations during the war with No. 6 Bomber Group. His first post-war transfer was to AFHQ, from where he was posted to No. 1 Pilots Training Course at Centralia and subsequently to No. 123 Search and Rescue Squadron at Sea Island. There he spent a considerable portion of his time flying helicopters.

From Sea Island, S/L Campbell went to Victoria, B.C. to serve as a Recruiting Officer for four years. During the past two years he has been flying Canucks and is presently Deputy OC of 413 AW (F) Squadron at Bagotville, P.Q.

HEAD'S-UP FLYING

Below is a report on a flameout landing in a Sabre. It was received in DFS from 1 Air Division. The situation was so well handled by the pilot, and his report so excellently written, that we felt Flight Comment readers should have a chance to look it over. This is "heads-up" flying for sure—and "heads-up" writing definitely.—ED

I was flying Number Four in a four-plane section. After a normal start and takeoff we climbed to 46,000 feet. Throughout the climb I maintained position with 675° TPT. As briefed, at altitude we cruised at 600°. When the section did the first turnabout, I noticed that the maximum power I could get was 97% and 675°; a forward movement of the throttle of about one inch did not change percent or engine TPT. I assumed that the jet pipe limiter had too low a setting. About five minutes later in a turnabout I noticed that I got 725 and a little less than 100%; this time the slightest change in throttle setting gave a corresponding change in tail pipe temperature and percent.

Within two minutes to five minutes we did another level turnabout to starboard. I maintained position with 97% and 675°. After 170° of turn I heard three distinct clunks, (a noise very similar to the one you hear when your "D" doors come up on start), and immediately throttled back, took off bank, and started a shallow dive. I advised the section lead of the trouble and examined my instruments. There was no indication of any trouble; all warning lights were out, TPT was about 500°, and engine rpm 75%.

I flew level and slowly opened the throttle but got no response; engine instruments remained the same. At this time I was about 35,000 feet. I returned the throttle to the idle position and selected emergency fuel system. I paused for at least 30 seconds. There was no change in engine instruments so I very slowly opened the throttle and got an expected raise in TPT and percent. At almost the same time the lead informed me that I had a flame coming out of the tail. I returned the throttle to the idle position. There was still no indication of trouble in the cockpit: no lights, no vibrations, no instrument fluctuations, TPT constant at approximately 450°, and rpm 70%.

Upon seeing the fire the lead ordered the section to channel 22. After the section checked in on the emergency channel, the lead advised me to set up a forced landing on Spangdahlem, which we had just passed, and informed me that he was going to 119.7 to advise Spangdahlem of the emergency. At point "A" and at approximately 25,000 feet Spangdahlem advised me that their aerodrome was closed except for my emergency. They also informed me that there were no barriers at each end of the runway and that I was cleared to land at either end.

Approaching point "B", at 14,000 feet, I noticed the engine was maintaining an idling speed of 30% but TPT was slowly beginning to go up until it reached 575°. There was a momentary pause; then it started to climb again. Just before it reached 600 I pulled the throttle around the horn. As I was stop-cocking it, the element in the aft fire warning light started to glow and immediately went out. Engine temperature immediately dropped off and rpm settled at 10%. I continued the forced landing and arrived over the button of runway 05 with 7000 feet and 230 knots indicated.

I slowly put on bank and advised Spangdahlem I was in a left-hand pattern. As I put on bank, my normal hydraulic pressure was dropping off to about 2000 psi. I tried to use as little control as possible but it continued to drop off. I lowered my undercarriage opposite the runway. I was well out, but 5000 feet indicated and 200 knots. I turned in to final estimating to be a little high.

At point "C" the hydraulics automatically switched to alternate system. I dropped full flap and continued the turn. My alternate hydraulics slowly dropped off until I was approaching the button with 1200 psi. I had to pull up slightly to get my nose wheel to finally lock down.

About 600 feet over the button I had 1000 psi but my ammeter was still reading 26 amps. I stuck the nose down and made a fairly steep approach. In spite of the low hydraulic pressure reading, I felt that I could make it because I still had very positive control. I flared out and put the aircraft on the ground at 180 knots.

I immediately started to break, opened the canopy, and watched the utility pressure drop off to zero psi before the end of the runway. I pulled off to clear the runway and brought the aircraft to a stop. A crash crew was waiting for me at this point and an ambulance was there before I could get out of the aircraft. The crash crew disconnected the battery and extinguished a bit of smouldering material in the data case compartment.

Throughout the forced landing there were no engine vibrations, the radio remained five squared, and the ammeter was a constant 26 amps.

The RT patter from the section and Spangdahlem tower were kept to a minimum and served to give me confidence throughout the emergency, particularly from the lead. His final remarks "If you are not happy, hit the silk", reminded me of this alternative and was given in such a cool tone that it helped me to make a clear assessment of my situation before I was too low.

THE FSO AND HIS JOB

F/L A. Morton has been Flight Safety Officer at RCAF Station Winnipeg for the past two and a half years.

Born in Vancouver in 1924, he attended Vancouver Tech before becoming an apprentice aircraft engineer at Sea Island in 1940. Enlisting in the RCAF in 1942, he served as an aero engine mechanic until he remustered to pilot in 1943 and spent a year overseas.

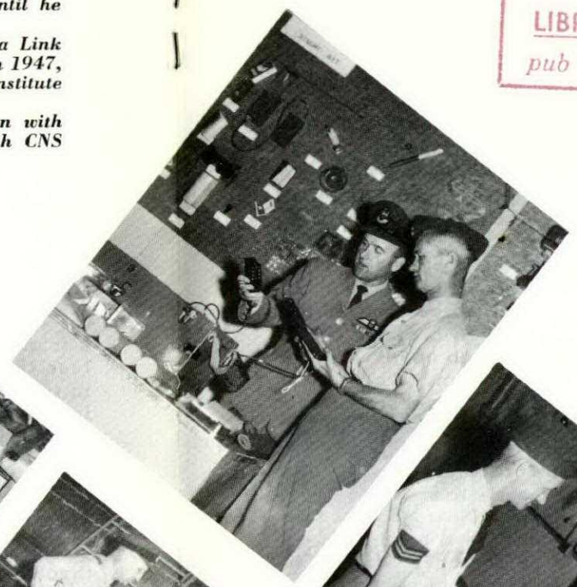
Returning to Canada after VJ Day the author qualified as a Link Instructor, serving in that capacity at Greenwood and Dartmouth. In 1947, he began a five-year tour of duty in aircrew selection with the Institute of Aviation Medicine, completing the tour at 2 PSU(O) London.

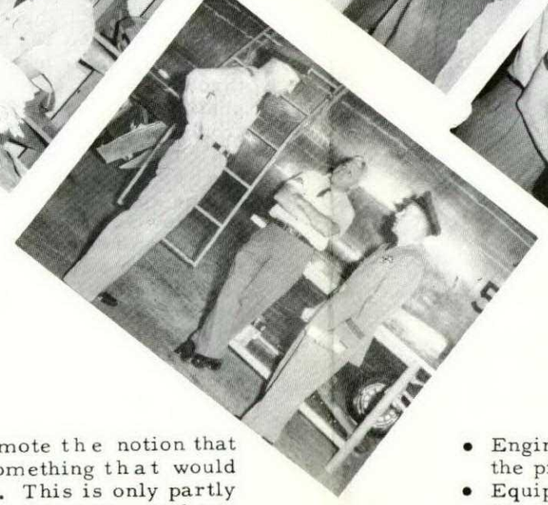
In 1952 F/L Morton began his current five-year association with navigation air training at Summerside, moving to Winnipeg with CNS in 1954 to assume his present duties.

An attempt to explain what the average FSO does to justify his appointment is rather like trying to explain what the average doctor does, when all the while we realize that two doctors, identically trained, may lead greatly varying professional lives solely because one of them practises in a mining community and the other in a university town. Because the occupational ailments of the populations in the two towns are dissimilar, the professional endeavours of the two doctors are channelled, by circumstances, into widely-differing areas of curative and preventive medicine. A parallel situation exists for FSOs on different RCAF stations.

The FSO differs from the doctor in one major respect: he is rarely, if ever, the actual instrument of cure for flight safety ills. FSOs are appointed to help senior station staff implement existing RCAF policy on all matters that eventually contribute to safer (and more economical) air operations. FSOs have no authority with which to support their recommendations; what they do have to assist them is a growing awareness among RCAF personnel that all flight safety activities eventually benefit everyone in the Air Force. Because of this planned lack of authority, and their specifically-designated function as the major liaison link between technical and air staffs, FSOs at larger stations are directly responsible to the station commanders. This arrangement frees them from the restrictions of the "proper channels" through which information normally travels.

This emphasis on freedom of action for the FSO is intentional, for easy gathering of specialist advice from several sources is often essential to the rapid, valid appraisal of a safety hazard and the early announcement to all concerned of the resulting remedial action or precautionary measures. The FSO's chief function is that of acting as co-ordinator among servicing, maintenance and aircrew. If a new modification is going to alter the flight characteristics of an aircraft, the FSO considers it a potential hazard and sees to it that pilots at the various units using this particular type are told what to expect.





This example may promote the notion that an FSO is merely doing something that would normally get done anyhow. This is only partly true, for the FSO adds the following vital assurances to the regular safety techniques:

- Early recognition and warning of the hazard by all concerned
- Speedier remedial planning (afforded by the FSO's aforementioned freedom of action
- Adequate UCR presentation to ensure recognition of the hazard by higher authority.

What does an FSO do during an average working day? Ask the people the FSO liaises with what they have been discussing, and you may find that the FSO has covered:

- Engine handling and air regulations with the pilot
- Equipment control and inspection with the SE Tech
- Aerodrome repairs with the CEO
- Vertigo with the MO
- Aircraft modification evaluation with OC
- Maint and OC Flying
- Aircraft accident and incident causes with almost everybody.

These are only a few of the topics that concern the FSO, who seemingly must try to be "all things to all men" to keep abreast of developments. But a considerable store of service experience, a little training (and much practice) in the use of the EO library, plus a finely-developed talent for "brain-picking" enable the FSO to cover effectively the all-embracing field of flight safety activities—which may even include preparation of an article such as this.

The effective FSO must be a dedicated officer—dedicated to the premise that safety of air operations is the vital concern of everyone in the RCAF and its supporting civil organizations. Unfortunately the increasing complexity of modern air operations and military organizations often results in such a ponderous and varied work load for senior staff, or a heavy, highly specialized work load for individuals in the field that they are unable to give adequate attention to their fundamental safety duties.

The appointment of an FSO serves mainly to emphasize these responsibilities by providing a specialist to help and advise the various personnel. The effective FSO, while helping to discover safety hazards or to conduct an accident prevention program, must take care not to become a "crutch" upon which personnel lean to help them fulfil their safety obligations, but instead strive to clarify and stress the basic safety concepts and practices inherent in the planning, support and execution of successful air operations. This is the FSO's goal: to reach the happy state where all rank levels and occupational fields are fully aware of, accept and competently discharge their responsibilities for the airworthiness and prudent operation of aircraft.

The activities of the average FSO, then, defy definition, since the effect of such variables as the size and location of the station, the nature of its air operations, the type of aircraft being flown, and the personality and experience of everyone on the station cannot all be provided for.

The activities of the FSOs are in the best interests of everyone—aircrew, groundcrew and taxpayer. Perhaps the continuing justification of their appointment will lie with the growing record of improved safety in RCAF air operations.

near miss

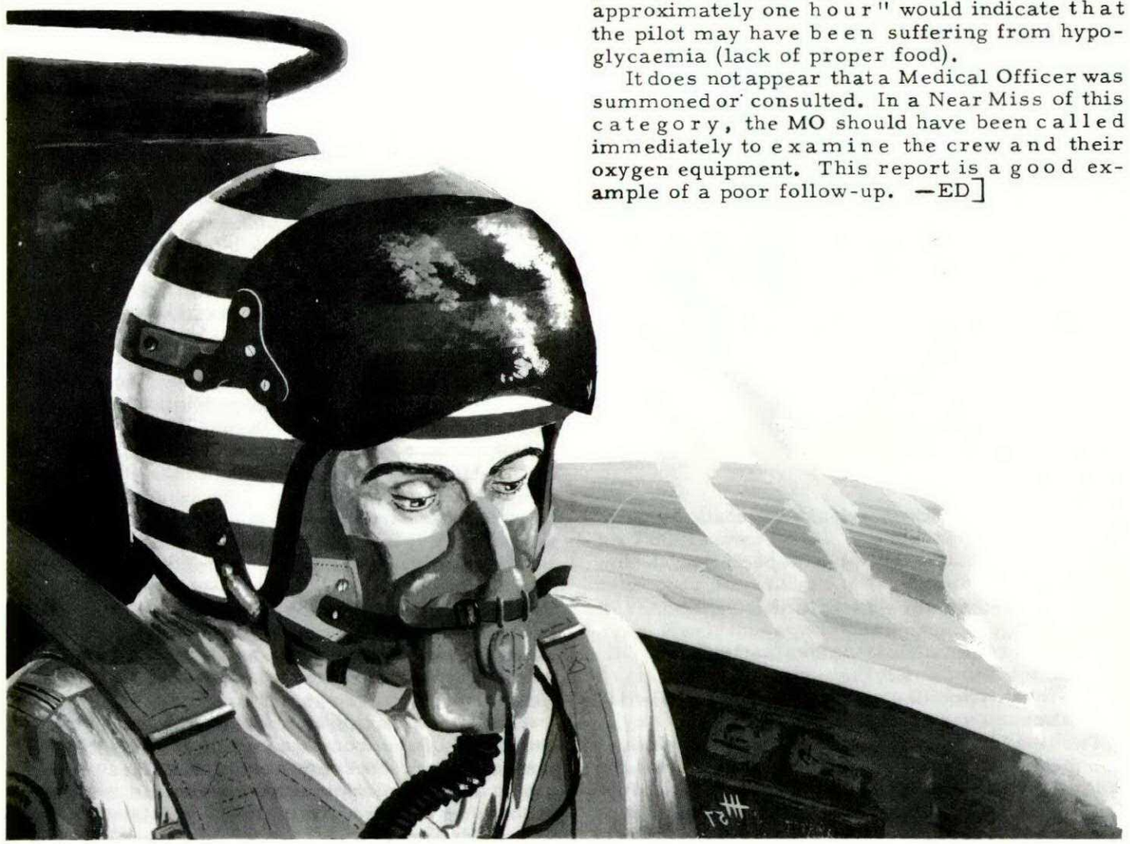
HYPOGLYCAEMIA?

"I was Number Two on a night IFR AI trip. Oxygen equipment on the Canuck was checked prior to takeoff and appeared serviceable. Takeoff and climb were normal. At approximately 31,000 feet and cabin altitude of approximately 18,000 feet I became nauseated and dizzy, and broke into a clammy sweat.

"I selected 100% oxygen and then used press-to-test but felt no immediate relief. Descended to cabin altitude of 10,000 feet and rapidly became normal. Repeated the climb, experienced the same phenomenon, and used the same emergency action. I then descended to 23,000 feet, returned to base and landed. Experienced some disorientation and lack of judgment during approach and landing. After flight, unnatural feeling and upset stomach persisted for approximately one hour. No recommendations."

[The pilot's action when he suspected anoxia was incomplete. He should have pulled his emergency oxygen bottle immediately after the press-to-test gave no relief. A thorough check revealed that there were no unserviceable components in the oxygen system. This fact, plus the "upset stomach which persisted for approximately one hour" would indicate that the pilot may have been suffering from hypoglycaemia (lack of proper food).

It does not appear that a Medical Officer was summoned or consulted. In a Near Miss of this category, the MO should have been called immediately to examine the crew and their oxygen equipment. This report is a good example of a poor follow-up. —ED]



WRONG COLOUR

While at a USAF base in Canada, a Vertol helicopter required three drums of 100/130 AVGAS to fill the tank. The pilot gave instructions to his crewmen to check the AVGAS and fill the aircraft.

As he was superintending the job, the crew chief noticed that the gas was a straw colour. Upon questioning USAF personnel about this, he was told that is was the same gas used in the other helicopters. Not knowing that the AVGAS Color Code is international, the crew chief had no alternative but to go ahead and refuel the Vertol.

Next morning, just before the aircraft was started up, the crew chief mentioned the incident to the pilot who immediately checked the empty drums and found that they contained ME gas which had been stored with the AVGAS.

Needless to say, the pilot drained his tank and refilled with green 100/130 AVGAS. As for the crew chief, he now knows the Color Code for AVGAS.

FOULED-UP TRIM

"Prior to takeoff in the Canuck, I checked my elevator trim and found it in the neutral position. Just after takeoff I trimmed back for climbing altitude and found the aircraft becoming heavier. The indicator showed a nose-down trim, so I trimmed forward on the assumption that the trim might be set up in reverse. When this proved correct, I continued my flight, remembering throughout that the trim was operating in reverse. Upon landing I reported the incident to a snag crew and the flight duty pilot.

"I should have checked the trims for correct movement on the ground. Luckily for me the weather was good, even though it was night; otherwise the trip could have resulted in tragedy. Careful work on the part of groundcrew, followed by a close check by myself to ensure that everything was functioning satisfactorily, would have prevented this incident."

PREVENT THE NEAR MISS

Points worthy of emphasis in preventing a "Near Miss" are shown below. They were extracted from correspondence in the USN Aviation Safety Review "Approach" between CAA and US Navy Operations.

Vigilance

The concept of "see and be seen" is rapidly nearing obsolescence; there is as yet no substitute for maintaining a thorough watch for other air traffic at all times. Laxity, by crewmembers or inattention to duty cannot be tolerated under today's traffic density.

Crew Coordination

Training programs must stress the need for close teamwork of all flight crewmembers and should establish clear-cut areas of duty and responsibility.

VFR Flight

VFR flights must not be attempted in marginal weather conditions.

Adherence to Flight Plans and Established Procedure

Cutting corners or other deviations are not to be tolerated. Departures from flight plan or established procedures to save a minute result in ineffective traffic control.

Procedures and Regulations

Failure to adhere to regulations and procedures can endanger all flights in an area. Regulations and procedures must be thoroughly understood and rigidly adhered to in the interest of everyone's safety.

Position Reports

Pilots must keep abreast of their position and report it accurately as required. If a fix is missed or a definite position is not known, traffic control must be advised in order that they can plan accordingly.

Radio Transmissions

Radio discipline should be rigidly enforced. Transmissions must be clear; unnecessary conversations eliminated.

USN: Approach

TOOL RIGHT— SAFE FLIGHT

Your hosts during this excursion into the "Whys and "Why Nots" of hand tools will be Lac Hammer-handle and his ancestor Eric "The Terrible Torque".

The old C-47 was letting down under instrument conditions when the windshield started to pick up heavy ice. The aircraft commander called to the copilot and asked him to turn on the windshield de-icer fluid. The copilot reached over to turn the knurled nut that actuates the system and found that it was stuck fast. Not only was the nut turned down so securely that finger pressure could not budge it, but countless previous applications of pliers to the knurling had chewed the edge of the nut to such an extent that a stillson wrench seemed to be the order of the day.

The crew chief finally appeared in the companionway with a pair of water pump pliers clutched in his hot little hand. After a period of wrestling between the two pilots (who were still on actual instruments) he managed to loosen the nut and start the de-icer juice flowing to the windshield glass. The flight made it home safely, but there was plenty of perspiration and some modicum of panic during those age-long seconds when the crew chief was working with those pliers.

The primary error in this instance was, of course, the overtorquing of a valve that should have been only finger tight. Insult was added to injury by the thoughtless use of pliers on a knurled nut to a point where the nut was chewed up unmercifully and dangerously.

"Pretty elementary," you say. "Kid stuff that every basic mech knows," you say. BUT—don't turn past this story and dismiss it with a snort of indignation. Your intelligence is NOT being insulted, and you'll win a nice fat bet if you lay even money that you can pick any aeroplane on the line at random and find glaring examples of hand tool misuse on the innards of that flying machine.

So what seems to you at first blush to be information that every mechanic instinctively knows, actually turns out to be carelessness or ignorance on the subject of hand tools. Even if you're an old-timer at this game it will pay off if you review the information outlined here. This stuff has been researched by experts in the industry; and with men who know machinery best, it's safety 100-to-1!

Stone Hammer First Tool

Back in the stone age, Og the Neanderthal Man had only his two hairy hands for tools, plus what help he may have gotten from his prehensile toes and strong back. He had to rely on brute strength alone.

Then one day Gog, another primitive man with a slightly weaker back, got mighty tired of being bossed around by Og the strong man. Gog discovered that by jamming a rock into the cleft of a stick he could bash Og's skull from a safe distance with less effort . . . and the hammer was born! Well, to paraphrase a hit tune, from the rock came the hammer, from the stick came the lever and for Gog a wonderful time.

Things progressed gradually along the hand tool line until Archimedes' time. Here was a real pusher. Old Arch not only invented the first practical wheel; he added to it the principle of the screw. Without these two basic principles there would be no aeroplanes today. Also there would be no baby carriages, electric mixers, spinning looms or any of the other items that make our lives more comfortable.

It was right here that some early-day sinner made a mistake. Some well-meaning soul adapted the principle of strong fingers to a tool that eventually became today's pliers. Old-timers have stated explosively that it was a bad day when that so-and-so made his discovery. Because pliers are easy to use—and misuse. If there had never been anything but an open end or a box wrench invented to turn that screw of old Arch's, many a hex nut would still be shapely and have square sides—unless of course our boy carelessly used the wrong size wrench.

But progress being what it is, we have the great-great-great-grandchildren of these primitive tools serving us every day, so we may as well learn to use them right and put this learning to proper use in our daily work. Volumes have been written on the proper use of hand tools, but the feeling still persists that hand tools are so simple that no one need bother to point out the right and wrong ways of using them. The care, handling and use of basic hand tools will be outlined here for your guidance and information. It should pay off for you—and the Air Force.

Check List

One of the marks of a good mechanic is the sound judgment he uses in caring for his tools. He prolongs their life and increases his efficiency and the quality of his work by keeping his tool box organized. He uses each tool only for the purpose intended. His check list looks like this:

- Keep tools as clean as possible when using them and be sure to clean them when putting them away
- Have a place for each tool
  Keep every tool you use in excellent condition
- Keep junk and unnecessary tools out of tool box
- Keep tool box securely locked and in a safe place when not working.

Judgment Important

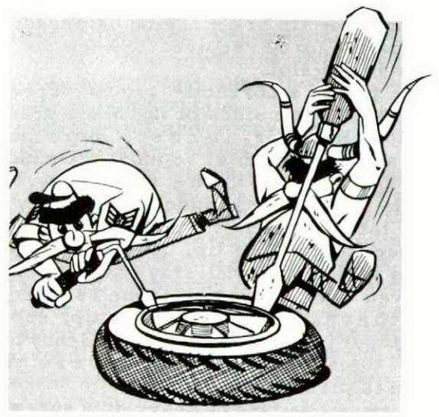
A good mechanic uses sound judgment in the selection of a tool for each specific job. For instance, he determines the proper weight, length and width of a tool and always selects that tool which is best suited for the job. His considerations are safety of flight, speed in doing the job, protection of parts being worked on, and personal safety.

He never lays a tool in any place where it may drop and cause personal injury and damage to the tool itself; he never lays a greasy tool on the upholstered seat of an aeroplane to the detriment of the pilot's pants.

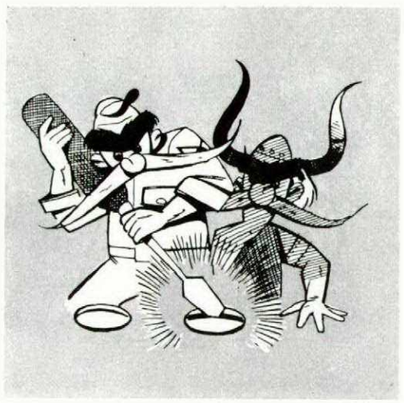
Frequently Misused

One of the most abused tools in the aviation industry is the screwdriver. Many mechanics seem to forget that there is a proper size screwdriver for every job. Often small screws are driven home with a giant driver. The result is a bruised slot. In particular, Phillips and Reed & Prince screws take the worst beating, usually because the mechanic is too lazy to walk over and get the right driver.

This may come as a surprise to some people, but the screwdriver is intended for one and only one purpose; to loosen and tighten screws. But too many mechanics, especially the beginners, use it for so many other purposes that it



Never pry with a screwdriver.



Keep shank vertical to head.

A screwdriver is no chisel.

Holding too close to head.

Always select the right size.

is the most misused tool in the box. The screwdriver with its slender steel shank and wood or plastic handle is designed to take considerable twisting force or torque. But it was not designed to be used as a lever, and bending force on the shank wreaks havoc with the shape of the tool. Used this way it will bend or break.

Remember, the tip of a screwdriver blade is specially tempered to make it hard. And the harder it is the more easily it will break if used as a pry. A bent shank is difficult to make perfectly straight. If there is a wobble in the shank, the driver's efficiency is impaired, for the blade will slip from the screw slot. This can damage the surface of the part being worked on and cause dollar loss.

Never hammer on the end of a screwdriver. It's not meant to be used as a chisel, punch or drift. However, there are certain conditions under which you will have to tap the screwdriver lightly. Let us say that you have to remove a rusty screw where the slot was filled with dirt or grease. In this case it would be all right to tap gently on the butt of the screwdriver, holding it at an angle to the slot. Then you might want to tap the tool gently into the slot for a snug fit. However, before you do any tapping on the handle, be sure that your screwdriver has a steel shank extending through the handle. If you hammer on a screwdriver without this type of shank you will most likely split the handle and the screwdriver will be worthless.

Screwdrivers are usually classified by size according to the combined length of the shaft and blade. In general they run 2-1/2, 4, 5, 6, 8, 10 and 12 inches, and the diameter of the shank and width of the tip are proportionate to the length of the screwdriver. Naturally, there are special purpose screwdrivers with extra thin or thick blades.

Too much emphasis cannot be placed on selecting a screwdriver that has a good fit in the screw slot. This not only prevents the screw slot from becoming burred or bruised, and the blade tip from being damaged; it also reduces the force required to keep the screwdriver in the slot.

The tip of a correctly ground screwdriver should have the sides of the blade practically parallel. However, it costs more money to grind a blade like this, so most manufacturers taper the blade out to the shank body. A good trick is to dress the blade on an emery wheel so the faces taper in very slightly for a short distance back of the tip. A screwdriver blade ground in this way will stay down in the screw slot even when severe torque is exerted. A blade that tapers out from the tip, especially if the taper is extreme, has a tendency to raise out of the slot whenever a severe twisting motion is placed on it.

There is one type of heavy duty screwdriver made with a square shank. The shank is extra strong and extra large, and it's designed to be torqued with a wrench, not a pair of pliers. Under no circumstances use pliers to twist a screwdriver!

Phillips Technique

Phillips screws are used frequently in the aviation industry. The advantage of this type of slotted screw is that the screwdriver can't slip sideways and spoil the surrounding metal. However, more downward pressure must be exerted on the Phillips driver to keep it in the cross slot. The most common Phillips tool sizes (4, 6, and 8 inch) will handle most Phillips head screws used in our aircraft.

To close this discussion on screwdrivers, remember: never use a screwdriver to test electrical circuits, especially where you have high amperage. This is one way to melt your screwdriver down to a nub—and perhaps your fingers along with it.

Hold Hammer Correctly

There are many kinds of hammers, but the one most used by aviation mechanics is known as the ball peen. The flat portion of the head is called the face, and the ball-shaped end is called the peen. Ball peen hammers are classed according to the weight of the head without the handle. They usually weigh 4, 6, 8 and 12 ounces; and 1, 1-1/2 and 2 pounds.

As simple a tool as the hammer is, there are still many "dull tools" who don't know how to use it correctly. Most beginners have a tendency to hold the handle too close to the head. This is known as "choking" the hammer. Holding the hammer like this reduces the force of the blow and makes it harder to hold the hammer head in an upright position.

When you want to strike a heavy blow, grip the handle close to the end. This increases the length of the lever arm and makes the blow more effective. Whenever possible, strike the object with the full face of the hammer. Try to hold the hammer at such an angle that when it strikes the object, the face of the hammer and the surface of the piece being struck will be parallel. This distributes the force of the blow over the entire hammer face and avoids damage to the edge of the face.

Never use an ordinary ball peen hammer where there is any danger of damaging either the surface being struck or the face of the hammer itself. When you have to use a hammer on a machined or polished surface, always protect that surface with a piece of soft brass, copper, lead or hardwood.

For certain classes of work there are special hammers made from rawhide, plastic or soft copper that protect the surface of the piece being worked on. Never use the butt of the hammer handle for bumping, such as tapping a bearing race into place. This practice may split the handle and ruin the tool. It's good practice to give your hammers a bath now and then. Use solvent and wipe them off with a clean cloth. A clean tool is a safer tool!

(to be continued)

USAF: AA & M Review

POSTERIOR PRICKLINGS

Apparently tests have been undertaken by a U.S. specialist in aero-medicine to determine whether a pilot receives aid in the form of "gravity reports" from nerve impulses transmitted through his seat. The specialist injected his backside with novocaine and when said sitter was completely anaesthetized, he was carried aboard an airplane.

The pilot took off and performed a number of slow rolls, loops and other aerobatics. As the doctor sat on his frozen posterior and was rolled around the sky, he discovered he had lost all ability to orient himself. Even though, in the course of other medical experiments, he had piled up many hours of aerobatic flying without undue discomfort, the specialist proved that when he lost his anchor of gravity appreciation — the seat of his britches — the psychological effect produced was one of fear, nausea and absolute disorientation.

The Log (Journal of the British Air Line Pilots Association)

Accident Résumé

Emergency!

A pilot of a Sabre aircraft experienced control difficulty and advised his leader that he intended to bail out if he could not regain control. He was flying at 25,000 feet. From the evidence of ground witnesses, the pilot did not eject until he was down to an estimated 700 feet. No reason for this delay is known but it has been suggested that the realization that he was so ill prepared for an ejection may have deterred him until it was too late. The parachute did not open.

Investigation revealed that the pilot was ill prepared for ejection in the following respects:

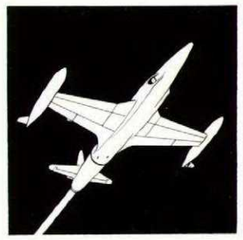
- The arming wire on the automatic parachute was not attached.
- The emergency seat pack was not attached.
- The chin strap on the inner helmet was not done up. On examination it was obvious that it had never been done up at any time!
- The outer helmet was not attached.
- The nylon ribbon on the oxygen hose had not been wrapped on the parachute and fastened.
- Because the seat oxygen tube was broken it is believed that the alligator clip was attached to the parachute harness.
- The pilot was wearing low shoes, one of which came off on ejection.

Any aircrew who is not prepared for any emergency is flirting with the grim reaper. Are you prepared?

Old Refrain

In carrying out a practice forced landing in a Sabre, the pilot landed over one third down the runway and elected to overshoot. As he later stated in the D14, "Power was applied and speed brakes selected; raised nose, left ground, and selected undercarriage up. The aircraft then settled on the ground and damaged doors and undercarriage."

The problem of raising the undercarriage prematurely is as old as Methuselah. It can be resolved only by the pilot who makes the selection.



Control Your Habits

A student instructor was receiving instruction in a T-33. The captain asked the pilot to practise a stall at idling rpm. With the throttle fully retarded the aircraft's undercarriage warning horn began to blow—and the pilot inadvertently pressed the emergency jettison button, thereby releasing both tiptanks.

The pilot's explanation was that he acted out of habit in reaching forward and pushing the button directly in front of him. He had flown only Harvard and Expeditor aircraft for six months prior to his particular flight, and both those aircraft have warning horn cut-out buttons in approximately the same position as the jettison button in the T-33.

Habit interference is a well known cause of accidents. Until such time as those people working on cockpit standardization achieve their objective, we must be prepared to find knobs and switches in different places in various aircraft types. Good safe habits are worth developing—but watch out for incorrect habit reaction when you climb into an unfamiliar cockpit.

Needless Fatality

A recent fatal accident involving a T-33 aircraft may have been caused by a partial or complete loss of power due to a defective pressurizing valve in the high pressure cock. The maintenance records of this aircraft revealed that difficulty was encountered in obtaining maximum engine rpm on several occasions during the six months prior to the crash. Rectification on six of these occasions was to "ground check as serviceable".

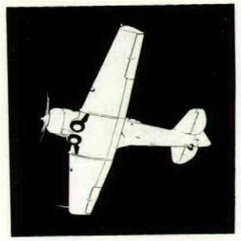
The corrective action taken reflects a disregard of EO 10B-15B-5A/2, dated 15 Oct 53, which notes that inability to obtain maximum engine rpm, and the possibility of flameout are both associated with sticking of the pressurizing valve. This EO also states that whenever one is unable to obtain governed speed or normal idling speed with the throttle closed, the aircraft should not be flown until the pressurizing valve has been examined for freedom of operation.

Good trouble shooting requires that maintenance personnel should be fully conversant with all Engineering Orders concerning the equipment for which they are responsible.

All's Well

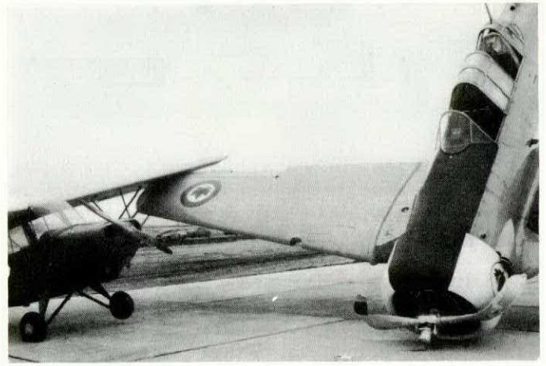
CAVU temperature 75°, wind velocity 250°-290°, 25-30 mph. Runway 8000 feet. The pilot was returning from a crosscountry trip and after landing, stated on the D14 that he carried out a normal circuit. On the final approach, as the airspeed was decreasing through 115K, the aircraft dropped and struck a lead-in light. Damage was caused to the port wing flap and the port undercarriage outer door was torn off.

Would you consider this a normal circuit?



Costly Taxiing

The pilot landed at an airfield where there were numerous runway and taxiway restrictions because of extreme spring breakup conditions. Tower cleared him down a taxiway parallel to the runway and he requested and was granted permission to cross the button of the live runway. Soon after crossing it he began a zigzag course. Suddenly he saw a light civilian aircraft parked on the taxiway preparing for takeoff. Unable to turn sharply in either direction without striking the side of it, he applied full brake. The Harvard went forward on its nose and the starboard wing struck the port wing of the civilian aircraft.



The cause of this taxi accident is the same old story: the pilot kept a poor lookout and taxied too fast. The tower failed to tell the pilot of the aircraft parked on the taxiway. A warning from the tower that a NORDO aircraft was parked on the taxiway might have averted this accident.

Fuel Management

Following one hour's dual instruction the student was sent solo and did four or five circuits, all with fuel selected from the left tank. On the downwind leg of the sixth circuit, shortly after his check, the engine stopped and the student noticed the red fuel warning light on. He switched momentarily to the right tank, failed to use the wobble pump, and switched back to the left tank. The Harvard's engine

caught and then died again. The student made a forced landing without selecting "wheels up". At no time during the emergency did he warn the tower of his trouble.

After a full hour of instruction using only the left tank—and considering his inexperience—the pilot should have been warned to watch his fuel state. Had he used the wobble pump on changeover to the right tank (and had he not switched back to left) he could undoubtedly have started the engine again.

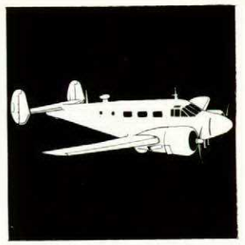
Collision and Nose-Up

An instructor and student left the line in a Harvard. The aircraft was taxied close to a fence and while executing a sharp turn to avoid the fence, struck a second Harvard parked on the line. In an effort to avoid the collision, harsh brake was applied and the aircraft nosed up, striking the propeller. The damage was reasonably slight but costly. It is good practice, when your aircraft is parked in a confined space, to plan your departure before entering the aircraft.

Good Work

A student in a Harvard was carrying out a solo exercise when excess oil appeared on the windscreen. In a few minutes the engine developed a "loud knock", there was a complete loss of power, and a large amount of oil obscured forward vision. The student informed the tower of his position and his predicament and then carried out a successful forced landing. Damage to the aircraft was slight.

The unit, the instructor concerned, and the student are to be complimented for a job well done.



Over-Control

While carrying out a flapless landing in a 20-degree crosswind with the surface wind at 20 mph and gusting to 35-40 mph, the pilot of an Expeditor was involved in a heavy landing. His corrective action consisted of easing the control column forward in an effort to hold the aircraft on the ground. Subsequently the pilot elected to overshoot, and he made a successful go-around. On landing it was discovered that both prop tips were damaged.

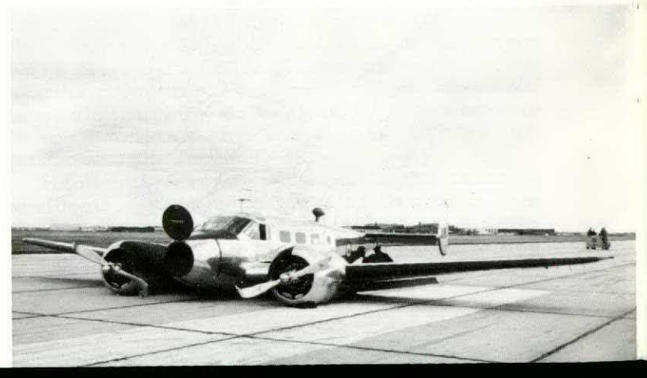
The corrective action taken by the pilot in this case is generally accepted. However, when you check forward on the control column during an initial landing run, the airspeed is high, and control is very effective. Under such circumstances, over-controlling can be costly.

Crew Cooperation

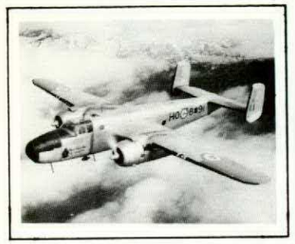
A touch-and-go landing deteriorated into a belly landing when the pilot selected wheels up instead of flaps. The following accident shows that a captain's preflight briefing coupled with good cockpit organization could have paid valuable dividends.

Two well qualified and experienced pilots were authorized for a local training exercise flying an Expeditor. The captain elected to practise a single-engined approach, followed by a touch-and-go landing. He was cleared to do so by the tower. With flaps selected at 30 degrees, a normal single-engined landing was made.

The captain's statement reads, "During the landing roll I reached out to make an up selection on the flaps but caught hold of the undercarriage lever and selected up." Realizing his mistake he put the handle down again and tried to keep the weight of the aircraft on the wheels to prevent retraction of the undercarriage. As can be seen from the accompanying photograph it was too late.



While we agree that it is desirable to complete the takeoff with the aircraft clean, the pilot should not divert his attention during this critical stage. Crew co-operation could have been used to provide a division of responsibilities—one of which could be the selection of services as directed by the captain.



Know Your Hydraulics

While carrying out a bombing exercise, the pilot of a Mitchell aircraft experienced hydraulic trouble. The main system hydraulic pressure dropped to zero, and the bomb bay doors would not close. On the return trip to base the pressure built up to 400 psi. The bomb bay doors were selected up and operated satisfactorily, but pressure returned to zero. The captain then elected to cycle the bomb bay circuit in an attempt to build up hydraulic pressure. This did not work, so the bomb bay doors were left open.

When the undercarriage was lowered by the emergency method, the hydraulic pressure returned to 1000 psi. The bomb bay doors were closed, the flaps were lowered, and a landing carried out. After landing the flaps would not come up. The captain taxied in, intending to park in front of the hangar. While he was manoeuvring in a congested area, his brakes failed and the aircraft ran into the hangar.

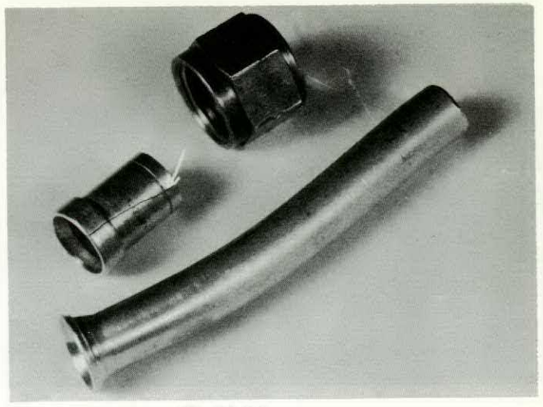
Now let us look at the problem from the beginning. When the bomb bay doors would not close and the main system pressure read zero, the chances are:

- the hydraulic pump failed or
- hydraulic fluid was low.

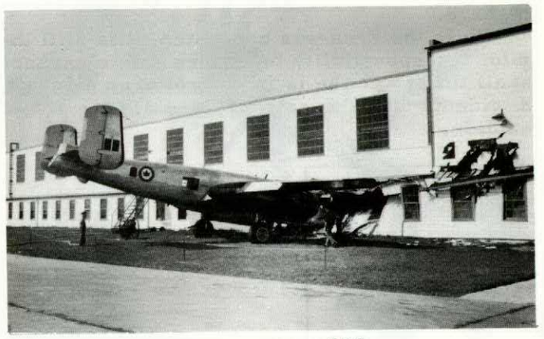
From the evidence—a temporary build-up of pressure with a subsequent loss when a service was actuated—a loss of fluid would be the most probable answer. With the hydraulic pressure at zero, an accurate check of the fluid contents can be made by the fluid contents gauge on the reservoir. When you have ascertained that a loss of fluid has occurred, a leak in the system must be suspected. Hydraulic systems must be used sparingly because any pressure on the lines will cause a further loss of fluid.

All services can be actuated using the emergency system. After wheels and flaps are down, turn the emergency hydraulic selector to "brake" to ensure proper braking action during the landing run. After the aircraft has been stopped, it should be left on the runway, or, if safe, taxied clear and shut down. A shop mule can then tow the aircraft to the hangar with no difficulty. The evidence shows clearly that hydraulic trouble also spells brake trouble.

The moral of this story is pretty clear. Do you know your hydraulic systems? Do you know all emergency hydraulic procedures?



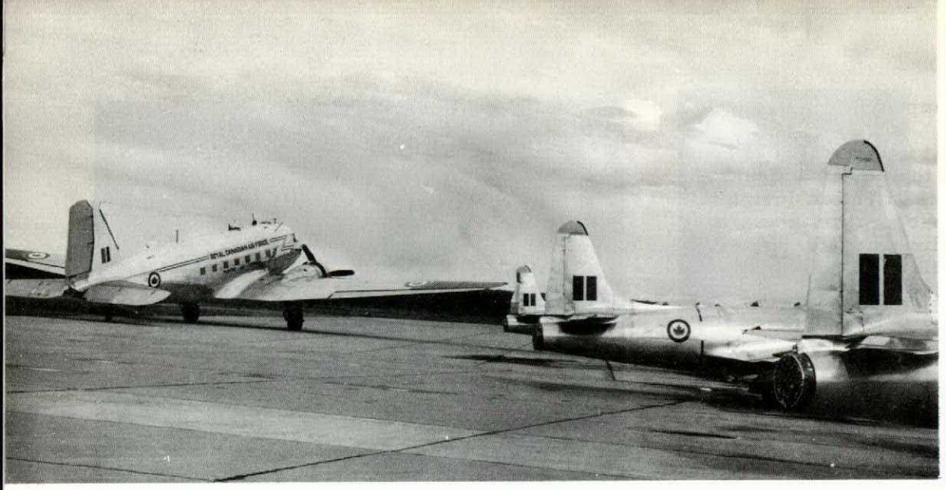
Should this.....



.....cause this?

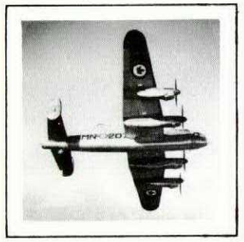
Nil Clearance

A Dakota was being taxied past a number of Sabre and Silver Star aircraft when its wing



tip struck the tail fin and rudder of the last Silver Star in the line-up, causing considerable damage.

While the area was congested, it is still the pilot's responsibility to ensure safe clearance at all times when he is in control of an aircraft. Accidents in this category are difficult to explain.



Over-Control—Groundloop

During the takeoff run in crosswind conditions the Lancaster commenced a swing to the left. By over-controlling, the pilot then caused it to veer right and back to the left again, the latter swing developing into a ground loop and causing considerable damage to the aircraft.

The crosswind, which was a contributing factor, was no worse than the pilot had coped with successfully on previous occasions. It is possible that over-confidence could have crossed the pilot up, but in any case it behooves one and all to review their crosswind techniques. The time to correct a swing is before it develops. Don't let over-control put you out of control!

NOON-HOUR HOMING PIGEON

Usually seen over training fields in company with others of the species. They appear regularly at two periods during the day—at noon and towards evening—circling the perching site, all trying to land at once, and accompanying their attempts with noisy chatter. The Flock Controller must be firm in his handling of this situation.

CALL: a very insistent, CLEARTLANDCLEARTLANDCLEARTLAND

Thanks to S/L G. A. Heck

BIRD WATCHERS' CORNER

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