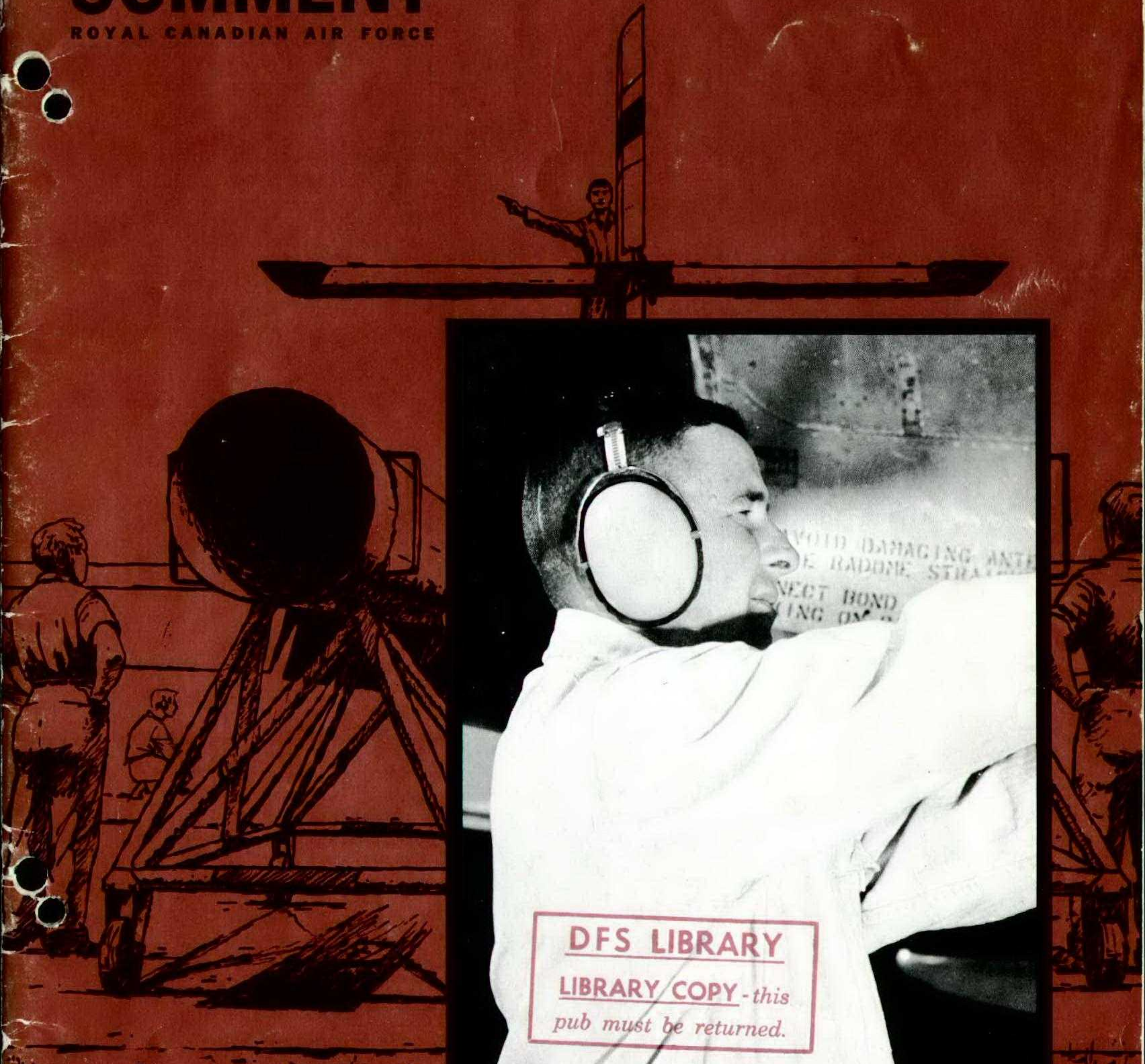
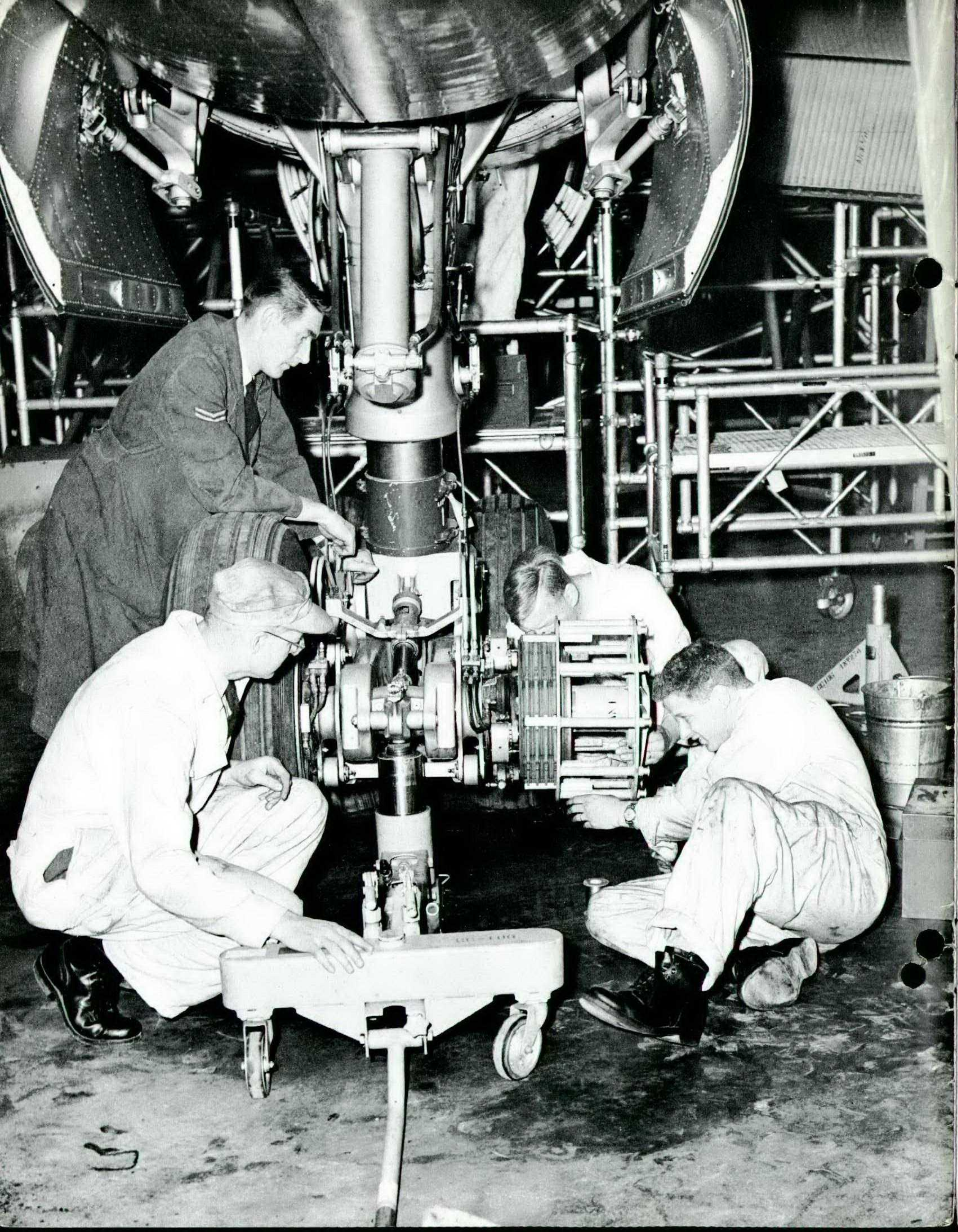
FLIGHT COMMENT

ROYAL CANADIAN AIR FORCE



JULY • AUGUST • 1961



EDITORIAL

During the infancy of flying, undercarriages were a rigid structure of "Vee" struts, wires and Bungee cords. Provided the pilot didn't drag it through the hedge, put a wheel in a pot hole or drop in from a great height, things generally weren't too bad, although accidents attributable to the undercarriage were many.

The years have rolled by and the undercarriage has passed through many phases and problems to the present modern retractable undercarriage. With the increased complexity of the undercarriage and associated electrical and hydraulic systems, accidents attributable to the undercarriage have also increased to the point where undercarriage malfunction and inadvertent retraction is the largest accident cause factor in the RCAF. This resulted in some 69 accidents in the last two years.

Undercarriage warning systems for the pilot and educational programs have brought pilot caused undercarriage accidents down to 20%. A professional approach by aircrew will go a long way to further reduce this figure.

Materiel failure caused 62.4% of the undercarriage accidents. These failures present a fertile field for accident prevention and call for more thorough and rigid inspections. When failures occur intensive investigation must be carried out to ascertain the reason for failure, and positive corrective action must be taken to prevent possible recurrences.

Maintenance contributed the lowest percentage (18.6%). Considering the complexity of the undercarriage on to-days modern aircraft, we feel that the maintenance personnel have done an excellent job and we hope they will continue with the good work.

Alert inspection, intensive investigation, positive corrective action and increased vigilance and care by all can reduce the number of aircraft accidents involving the undercarriage.

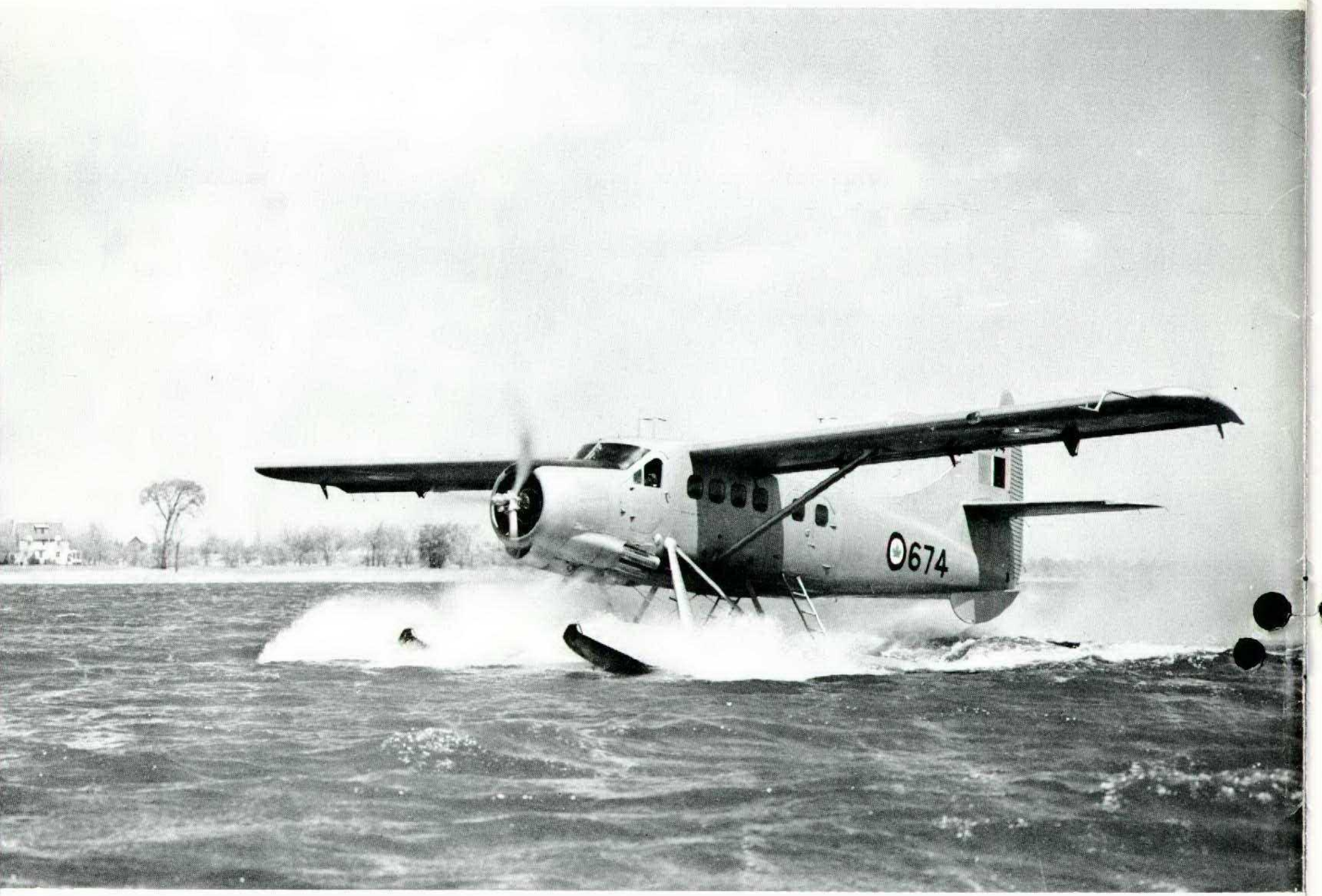
J.J. Jordan

J.J. JORDAN, GROUP CAPTAIN
DIRECTOR OF FLIGHT SAFETY

ARE YOU TAKING TO THE WATER?

With the continuing Search and Rescue commitment, the introduction of the "ALBATROSS" Search and Rescue aircraft and the increase of "OTTER" aircraft, Amphibious operations will continue to play an important part of the RCAF's total effort. Many RCAF aircrew with little or no experience will find themselves engaged in operating off or into a water base.

Flying off water is deceptively easy. Under normal conditions, with moderate winds and just a slight chop on the water, flying a flying boat is almost automatic. In many cases un-



limited expanses of water for manoeuvring almost eliminate the need for precision spot landings.

It is a relatively simple matter for those with little water experience to be lulled into a feeling of overconfidence after a few take-offs and landings. This is specially true for those who have never had any small-boat experience. In handling a flying boat on the water, it must be remembered that you are operating a boat subject to certain requirements in the way of seamanship that cannot be picked up overnight.

TAXIING

Before taxiing an intimate knowledge of the water base is essential. Surface conditions, tides, currents and floating obstacles to be expected should be ascertained. Floating logs and particularly "dead heads" with but an inch or two showing above the surface are quite frequently encountered in our lakes and rivers. Taxi time during the warm up period can be used to good advantage by surveying the take-off path for floating obstacles. Water depths in the manoeuvring area is of prime importance. The position of submerged rocks and sand bars must be predetermined. Where possible get a briefing from pilots familiar with the base and neglect no opportunity to make a close examination from the air. For coastal operations variations in the depth of water due to the tide must be considered. An area which is safe at high tide may well have shallow water and obstructions at low tide. With adequate knowledge of water depths, surface and submerged obstacles, an appreciation of the effects of wind and tide, a pilot with the exercise of skill and care can avoid those collision accidents.

TAKE-OFFS

Under ideal conditions the take-off presents no undue difficulty. Long stretches of water, normally available, have advantages not found when operating from the restricted lengths of land runways. Special technique is required, however, when faced with heavy swells, rough water or crosswind conditions.

LANDING

The majority of water landings are made without the help or advice of flying control. A close survey of the landing and docking area is, therefore, essential. A hasty approach, without at least one circuit is inviting trouble. Having determined the wind, the selection of the landing run will depend on the configuration of the water area, the depth of water, the location of submerged and floating obstacles, the conditions of the water surface and the location of the dock, beach or buoy. Before committing himself to a landing at a strange base an experienced pilot will carefully assess its suitability for the subsequent take-off. Having selected the landing run, surface conditions may suggest a special landing technique.

LANDING IN ROUGH WATER

Landings may be made in water much too rough for a take-off if the power-stall is used. The power-stall landing consists of putting the aeroplane in the proper attitude for a landing at some distance above the water and maintaining, by the use of the engine, just enough speed to allow a gradual rate of sink. Care must be taken not to let the speed get too low, as the usual consequences of a stall will result.

LANDING IN GLASSY WATER

The most hazardous condition frequently encountered by sea-plane and boat pilots in Canada is that due to glassy water. The condition is well known and all qualified water-borne pilots will have had instruction on the technique to be employed. The problem then is to determine when the condition exists. Should there be doubt, assume glassy water and approach accordingly. Difficulty frequently arises under marginal conditions when the pilot thinks that he can see the surface and changes to a normal landing technique. That's where the trouble starts. At best, one escapes with a violent reminder that all is not well with the landing technique. Alternatively, survivors may have some unpleasant under-water experiences to relate to the board of inquiry.

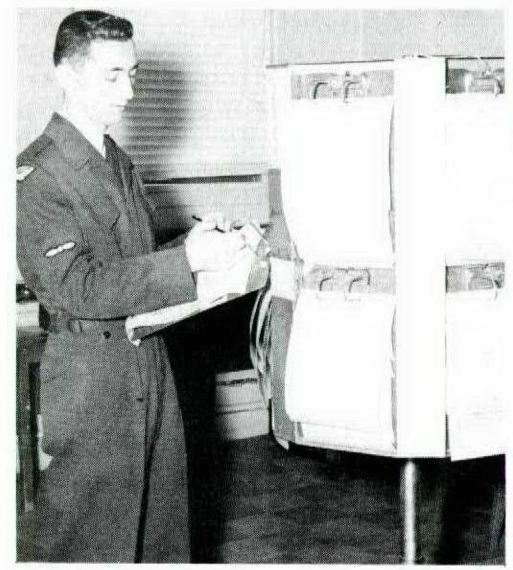
SECURING

Unlike flying from a land base where a smooth landing to all intents completes an operation, the seaplane or boat pilot has an additional and sometimes tricky chore to secure his aircraft. The type of dock, the beach or buoy, in relation to the current wind will indicate the method of approach. The water characteristics of aircraft will affect the technique to be used. The combination of forethought, good seamanship and a well trained crew properly briefed for the manoeuvre is essential. Having secured the aircraft, responsibility for its safety must be established by the captain. High winds and waves must be anticipated and it is often necessary to leave a crew aboard a flying boat at moorings. Aircraft left at docks should not be without a guard and regular pilot inspection of securing ropes and bridles is essential to a good seaplane and boat operation.

CONCLUSIONS

In the past few years the emphasis in the RCAF has been primarily on jet flying. We still have, however, a requirement for a relatively small number of skilled water-borne pilots. Although somewhat less spectacular, the occupation has many advantages associated as it is with advanced base operations. There is a greater freedom of action which in turn permits a pilot to exercise more initiative. His responsibilities are increased and must be accepted if unnecessary accidents are to be avoided. Additional and continuous training in seamanship is required. Some sail-boat time, which makes one conscious of submerged and floating obstacles and the peculiarities of wind and current, is time well spent in the training of a seaplane pilot. In conclusion, let us keep our summer free of watercraft accidents. Watch out for that glassy water surface. When in doubt assume the condition exists. Remember all water is suspect until your inspection proves otherwise. Check for submerged rocks and sand-bars. Watch for floating logs and dead-heads. Carefully preplan your docking, beaching, or mooring, because through failing to do so, you might find yourself up the well known creek. Maintain a well trained crew and keep them briefed on your plan.

LAC J.P. MURPHY



LAC F.M. PELLEY

LAC Murphy ACOp, while on duty in Rivers tower monitored a transmission from an aircraft to Broadview radio. The pilot was experiencing difficulty with icing while flying at 9000 feet and was requesting information from ATC regarding icing in the lower levels.

Realizing he might be able to help, LAC Murphy contacted LAC Pelley Met/Obs who was on duty in the met section and then alerted the DFCO. LAC Pelley consulted the area forecaster and advised ATC of the correct course of action while the DFCO alerted GCA and proceeded to the tower in the event the aircraft might have to land at Rivers.

Listening watch was maintained and shortly after the pilot was heard to request an immediate descent to Minimum Enroute Altitude. ATC were unable to clear the aircraft below 6000 feet because of conflicting traffic. Rivers established radar contact and passed the necessary separation information to ATC for emergency descent. Fortunately the aircraft in difficulty broke out between layers of cloud and was able to proceed to Winnipeg.

The alertness, and quick recognition of the problem displayed by LAC Murphy and LAC Pelley and their subsequent actions, along with the staff of RCAF Rivers are highly commendable and are deserving of a Good Show from Flight Comment.

ARE YOU SURE OF YOUR ALTITUDE?

It is inconceivable that a capable, experienced pilot would deliberately fly below the tops of prominent terrain features, particularly under instrument conditions. Nevertheless, accidents of this type occur all too frequently. The question then arises, "Was he off his altitude?" or "Didn't he have the current altimeter setting?"

DID YOU KNOW THIS TYPE OF ACCIDENT CAN OCCUR EVEN IF YOU ARE INDICATING THE PROPER ALTITUDE AND DO HAVE THE CURRENT ALTIMETER SETTING?

Most pilots confidently expect that the current altimeter setting will compensate for irregularities in atmospheric pressure. Unfortunately, this is not always true. In fact, under some conditions, the correct altimeter setting will actually aggravate errors in altitude. We expect far too much from the altimeter setting. After all, it is only a correction for non-standard atmospheric conditions from the surface down to sea level. It makes no attempt to correct from the surface up.

The pressure altimeter, correctly set, is good for flight-level separation because any atmospheric error is common to all aircraft in the area. It is also useful for landing, at which point possible atmospheric error diminishes to zero. BUT, THE PRESSURE ALTIMETER WILL NOT TELL YOU HOW HIGH YOU ARE WHEN IN FLIGHT.

What can you do to anticipate a large discrepancy between indicated altitude and true altitude? First, let's review this instrument from a slightly different angle. Because we will discuss a new approach to an old subject, it would be best to begin completely fresh with no preconceived ideas. To illustrate, here are a few statements almost universally accepted, yet they are not true.

1. The pressure altimeter reads approximate true altitude if the current setting is maintained.
2. A high altimeter setting (high surface pressure) means that the aircraft is higher than indicated.
3. True altitude may be computed in flight by correcting for flight-level temperature.

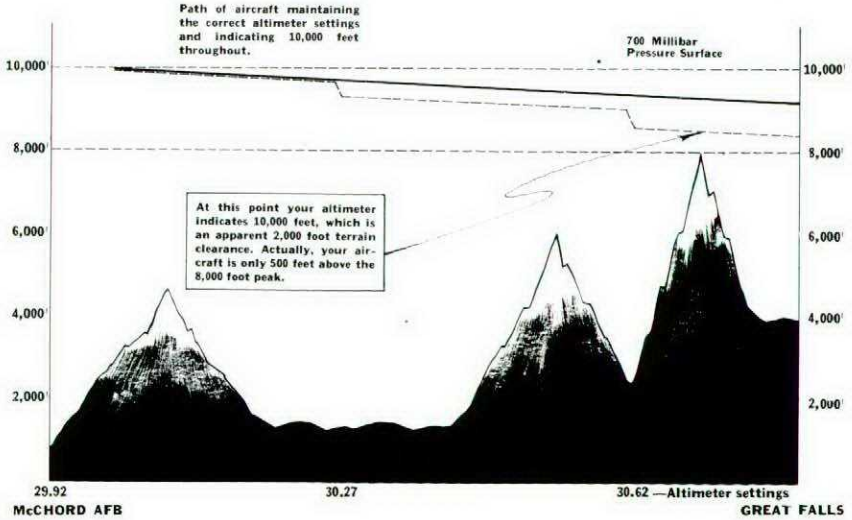
THE ABOVE STATEMENTS ARE FALSE.

What determines the indications of the pressure altimeter? There are only three (3) variables.......

1. The atmospheric pressure which the instrument is measuring.
2. The mechanical displacement of the indicator needles...the altimeter setting.
3. Instrument error. (This is largely an unknown but may be expected to be within plus or minus 3% of the reading.)

Aside from the possible instrument error, it is easy to anticipate the effects of the other two variables. The basic information is readily available in the weather station. By asking for two specific items of information during the preflight weather briefing, you can at once determine if you will be higher or lower than indicated and by what amount.

As an example, consider a flight from McChord AFB, Washington to Great Falls, Montana on the afternoon of 24 March 1955.



You have the following discussion with the weather forecaster:

PILOT: I intend to file for 10,000 feet, which is the standard height of the 700 millibar surface. Is the height of the 700 millibar pressure surface above or below normal and by what amount?

FORECASTER: According to the latest charts, the height of the 700 millibar surface will be about normal here at McChord, but will be about 800 feet below normal over the Rockies.

PILOT: Well, that will put me 800 feet lower than indicated to begin with. What are the altimeter settings along this route?

FORECASTER: The altimeter setting is standard here at McChord and increases to a maximum of 30.62 inches near the Rockies. What effect does that have?

PILOT: Because a high setting increases the altimeter scale indications, I will naturally lower the aircraft to maintain desired indicated altitude. In this case, the difference will be ...

Actual setting	30.62
Standard setting	29.92
	.70 x 1000 = 700 feet

FORECASTER: How high will you actually be?

PILOT: Add the two effects...

Variation of 700 millibar surface from standard	-800 feet
Effect of high altimeter setting	-700 feet
	-1500 feet

I will actually be at 8500 feet, which is 1500 feet below my indicated altitude of 10,000 feet. The terrain is about 8000 feet just to the west of my destination, so I'll file for 12,000 instead - just to be on the safe side.

This example was an actual weather situation and is neither unusual nor outstanding. Combined errors of this type may reach as much as 2,000 feet. If you are one who relies upon the current altimeter setting when flying at minimum altitudes, you had better think again.

A HIGH ALTIMETER SETTING combined with a LOW HEIGHT OF THE PRESSURE SURFACE (at flight level) is particularly dangerous.

Fatigue

Fatigue is a difficult thing to define, describe, or explain. We all know it exists and have experienced it in many ways and degrees. Perhaps the simplest way to think of it is as a temporary loss of ability to cope with a task, i.e., a loss of fitness. The factors producing it may not be associated with the task. The active, physical fatigue which is due to activity without recent rest and which is felt as a pleasant tiredness or lethargy or as a mild aching of muscles, is well known and common to many physical tasks. Aircrew in addition are subject to a form of mental or skill fatigue which can occur even in idleness. It is related to the concentration, responsibility, and apprehension of flying or waiting to fly. It has been said that pilots are either bored to death, worked to death, or scared to death! All of these are mentally and physically exhausting and may accumulate day by day to a chronic state known as "pilot fatigue" unless relieved by frequent rest, recreation, or leave from duty.

RCAF Pamphlet 69

ALL THE HELP YOU NEED

Modern jet aircraft have been known as supersonic fighters, high speed interceptors and, lately, missiles with men in them. And as long as there are men in them, and the performance factor continues to rise, there will be an increased requirement for the utmost in air safety.

While aircrews are drilled in air safety measures from their first aviation class, it is the aircraft that contain the life-preserving equipment.

Perhaps the most important item to the jet pilot is his oxygen gear, for at high altitudes he cannot survive without it. Most modern systems include a set of storage bottles, made of shatter-proof metal, and a circuit of plumbing which leads to a regulator in the cockpit. The regulator controls the amount of oxygen mixed into the air according to the height at which the aircraft is flying. This equipment is inspected by technicians at regular intervals with close attention being paid to the length of time a regulator is in service. Also, the oxygen supply is replenished immediately after each flight, with precautions taken against the presence of dirt, grease or fuel.

A 'bail-out bottle' is installed in the cockpit for use in case of an emergency in the main system. It supplies sufficient oxygen for a fast descent to safe altitude or for use in case of an emergency ejection at high altitudes.

If an emergency should occur in the air, the seat in which the pilot spends his airborne hours enables him to escape safely at high speeds. The seat is ejected by a cartridge-operated gun which lifts both seat and pilot clear of the aircraft. An automatic mechanism separates them and opens the parachute for a safe descent. Provision is made for automatic operation of radio equipment on ejection.

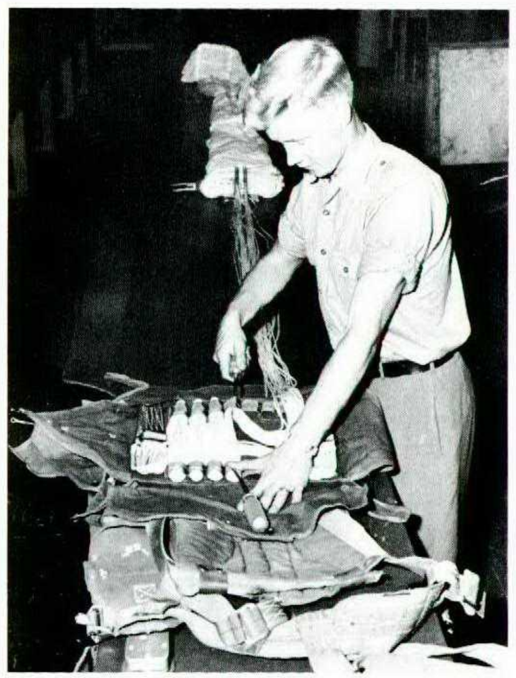
The parachute, which has carried thousands of aviators to safety, has been developed into an efficient, compact unit. It is issued to aircrews as part of their personal flying gear, and it must be turned in to the Safety Equipment section periodically.

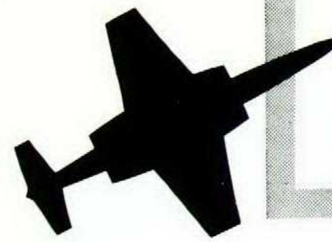
Every two months the chute is released from the pack for inspection and hung in a three-story drying room from the apex until all creases have fallen out. The drying usually takes from 12 to 24 hours. Then, deft hands fold the billowing yards of silk into a compact unit ready to open in an instant should it ever be needed.

But safety measures are not complete when the pilot reaches terra firma. Part of the equipment strapped to him is an ingenious seat pack which serves as a cushion during the flight. Spirited into this canvas pack little more than a foot square and only five-and-one-half inches deep are such items as a sleeping bag, oxygen bail-out bottle, insect repellent and netting, whistle, 25 feet of snare wire, survival instruction booklets, a search and rescue and homing (SARAH) radio unit with battery pack and homing beacon; fishing kit, compass, first aid kit, rations and a generous supply of wool stockings and mittens.

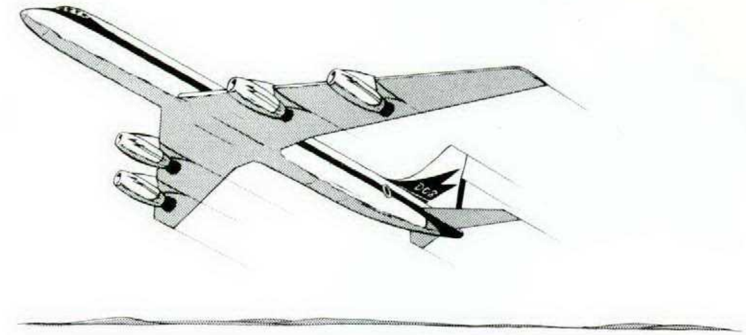
In short, it contains enough equipment to sustain a man almost indefinitely when combined with a knowledge of bush lore. For aircraft flying over large bodies of water, the contents vary slightly. The sleeping bag is replaced by a dinghy and the pilot is required to wear a Mae West, self-inflating life jacket over his immersion suit.

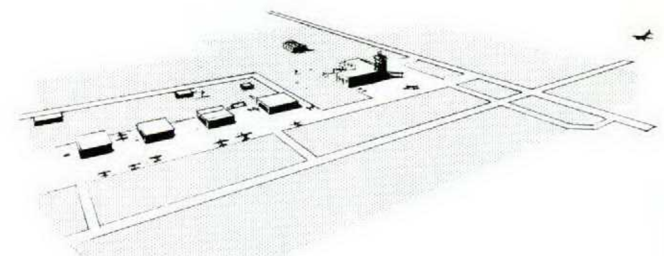
While every precaution has been taken to provide equipment for survival in the event of an emergency, the use of the equipment is in the hands of the aircrew. If you don't know all about the emergency equipment, see your Safety Equipment section and get the information first hand. Your emergency pack is not a surprise package, know what's in it, and how to use it.





NEAR MISS





THE BIG BLOW.

On a routine flight from Quebec to Ottawa, a Dakota aircraft was cleared to land off a right hand base behind a DC8 which was on a long final for r/w 32 at Uplands. The DC8 was on an unknown frequency and the Dakota was on 126.2. The DC8 was given landing clearance by the tower and unknown to the pilot of the Dakota, was on a touch and go procedure. The Dakota was from 1-1/2 to 2 miles behind the DC8 when approaching the end of the runway for round out. Turbulence was anticipated and the distance allowed was considered ample for safety. At about 200-300 feet severe turbulence was encountered and the Dakota was thrown about violently making control extremely difficult. Flaps and undercarriage were retracted by the co-pilot and emergency power was applied by the captain. There was no need to pull off the side of the turbulence as the turbulence literally threw the aircraft violently in this direction. The Dakota completed the overshoot without further complications.

In the form of recommendation it is considered that the distance allowed behind a large jet aircraft in the landing pattern should be increased commensurate with safety to allow for the jet wash and airframe turbulence caused by these aircraft.

It is also considered that the controlling agency should inform the No.2 aircraft on landing of the intentions of the jet aircraft, when the two aircraft are on different frequencies.

(This particular case was investigated and the tape recording of the tower transmission was played back. The actual transmission from the tower to the DC8 was as follows: quote "802--cleared to land 32--gear down and locked--touch and go" unquote. The pilot of the Dakota heard the "clear to land" and then ignored the balance of the message.

This happens too often. When we are anticipating a transmission and we know what is coming up we hear the first part of the message and then close our ears to the rest of it. This is a natural action when we are busy in the cockpit preparing to land. But natural or not we must guard against this tendency.

(The problem of turbulence behind a multi-jet engine aircraft on full power is a serious one. In this case at 1-1/2 to 2 miles the turbulence was sufficient to throw the aircraft out of the wake of the jet engines of the aircraft. If you are following a jet in the landing pattern keep your eyes and your ears open, and if you are in doubt about the intentions of the jet pilot confirm with the tower. —ED)

PROTECTION FROM NOISE

by Keith K. Neely,
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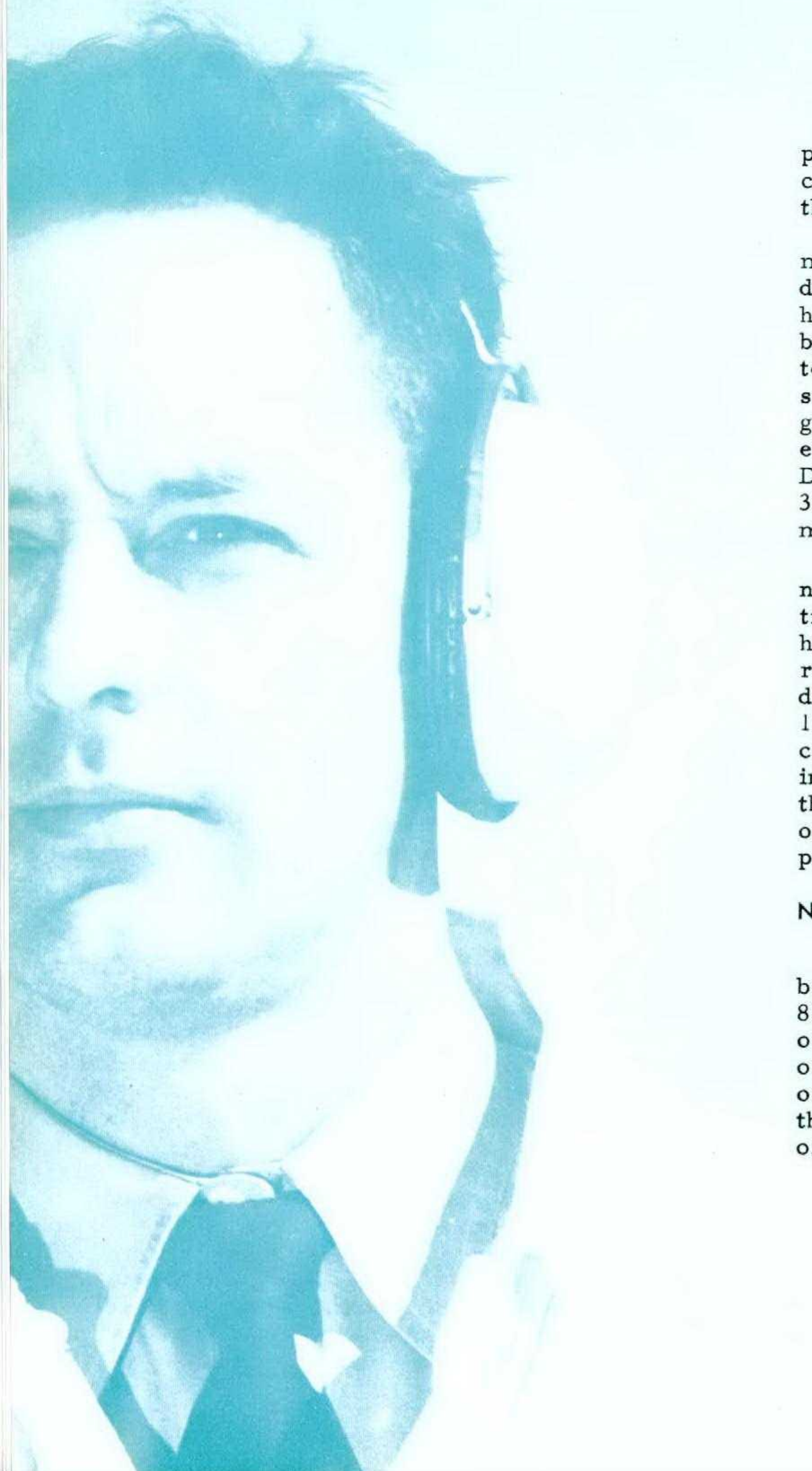


High-intensity noise generated by high-performance aircraft and associated equipment creates several important problems. One of the most serious is damage to hearing.

Slow progressive losses of hearing acuity may occur unnoticed until the individual suddenly realizes that he has sustained a loss in hearing. Then it is too late. Deafness caused by exposure to noise, with the exception of temporary hearing loss which may last for several days, is permanent and cannot be regained. Pain in the ear is no criterion for estimating the damaging potential of the noise. Deafness can be caused by noise whose level is 35 to 40 decibels (db) below the level which may cause pain.

Personnel on the ground may be exposed to noise levels that exceed 140 db. Exposure times may vary from a few minutes to several hours per day. Noise levels generated by rockets and missiles may reach levels of 175 db. Inside aircraft noise levels of from 85 to 120 db are not uncommon. In propeller aircraft the highest levels of noise are to be found in the "plane of the propellers". In jet aircraft the highest noise levels are found at the rear of the aircraft at positions just aft of the tail pipe.

NOISE: EFFECT ON HEARING

Longtime exposure to continuous broad-band type noise whose overall level exceeds 85 db in any octave band may cause both temporary and permanent hearing loss. The amount of loss suffered will be a function of (1) intensity of the noise, (2) distribution of sound energy in the noise, (3) duration of exposure(s), (4) length of time between exposures and (5) the state of the person's hearing mechanism.

Studies made on the hearing acuity of several groups of aircraft maintenance workers have shown a significant number of marked permanent hearing losses. Similarly, significant numbers of aircrew, after long exposure to high-intensity noise, have suffered severe permanent hearing losses. Temporary hearing losses which may last for several days may also be caused by a few hours of exposure to high-intensity noise.

PROTECTION PROCEDURES

Protection of the hearing of personnel exposed to high-intensity noise may be provided in many ways. These include: (1) reducing the noise levels at the source by using silencers, mufflers, modifying engine design, and operating the engines at reduced power; (2) utilizing maintenance procedures that reduce the noise exposure times; (3) isolating maintenance and other personnel from the noise, such as using movable sound-proofed capsules or concrete shelters, and (4) providing exposed personnel with ear protection.

Static and portable silencer systems reduce the noise levels considerably, but in most instances ear protection is required nevertheless. Similarly, with modified maintenance procedures which may reduce the noise exposure times and intensities, ear protectors are still required. The use of concrete shelters and movable sound-proofed capsules will provide adequate protection but may introduce problems of procedure.

EAR PROTECTION EQUIPMENT

Ear protection, in the form of ear plugs, earmuffs or helmets, is an efficient practical method of protecting the hearing of personnel who work in noise whose level is below 150 db. The amount of protection from noise afforded by ear plugs, earmuffs and helmets varies considerably. Cotton gives no protection whatever while the MSA V-51R type ear protector is one of the best available and can be obtained on request from the Medical Officer or Flight Safety Officer. These ear protectors have to be individually fitted, to insure maximum sound attenuation (ear protection) and comfort. They must also be kept clean, and should be washed with soap and water, given a thorough rinsing, dried and kept in the container in which they were issued, while not in use.

Several types of earmuffs are available commercially and the NRC-type earmuff, which has liquid-filled ear seals, is now available to Service personnel exposed to high-intensity noise. This earmuff provides adequate and comfortable protection. Earmuffs must also be kept clean, and the headband checked for tension and replaced if adequate pressure on the sides of the head cannot be obtained. Earmuffs, fitted with liquid-filled ear seals, must be handled carefully. These earmuffs, unlike previously used kapok-filled ear buns, are designed to provide ear protection and at the same time make possible better perception of speech and other sound signals. This cannot be achieved if the ear seals are damaged. Earmuffs inserted in helmets or worn with a headband for use by air and ground crews must also be fitted properly, headband and associated straps must be adjusted properly.

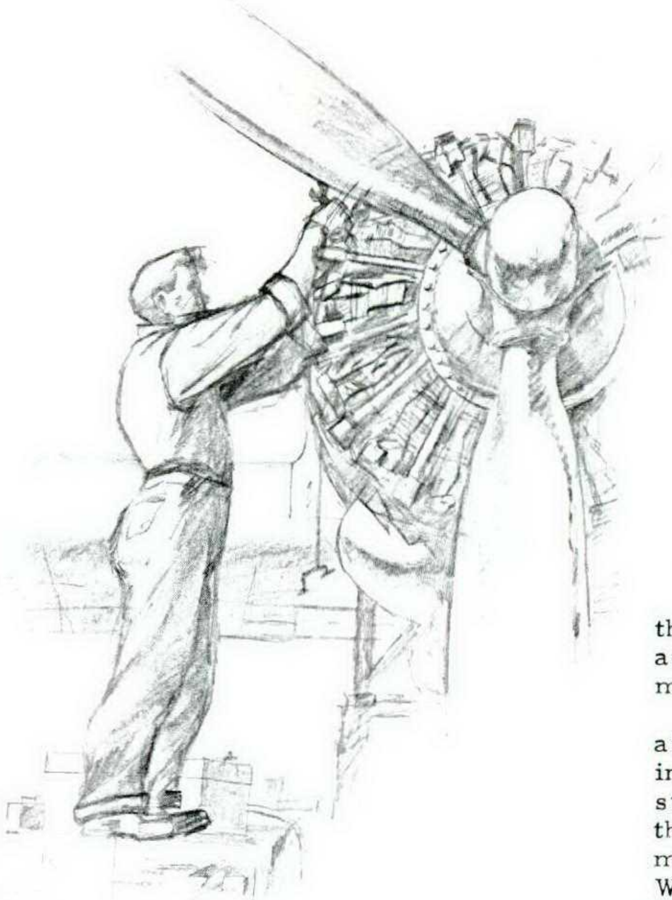
Training in the perception of the reduced intensity of engine sounds, taxiing aircraft, voice communications, takes very little time. One can hear engine sounds and speech much better when protectors are worn in noise whose level is between 90 and 115 db since both the noise and the speech or other sound signals are reduced to intensities that the ear can more accurately accommodate. Adequate perception of speech and other sounds under quiet conditions can readily be gained merely by undoing the chin strap or removing the earmuff or ear plugs.

Take advantage of every opportunity to retain your present hearing. Ability to withstand noise is not related to one's physical status or courage. Hearing loss is not a "badge" of distinction or of a trade, rather it is a sign of ignorance, carelessness or stupidity. The accummulation of hearing damage usually goes unnoticed until suddenly one realizes that he is partially deaf. Continuing deafness precipitated by exposure to high-intensity noise is permanent. It is then too late to do anything other than to try to keep what hearing remains.

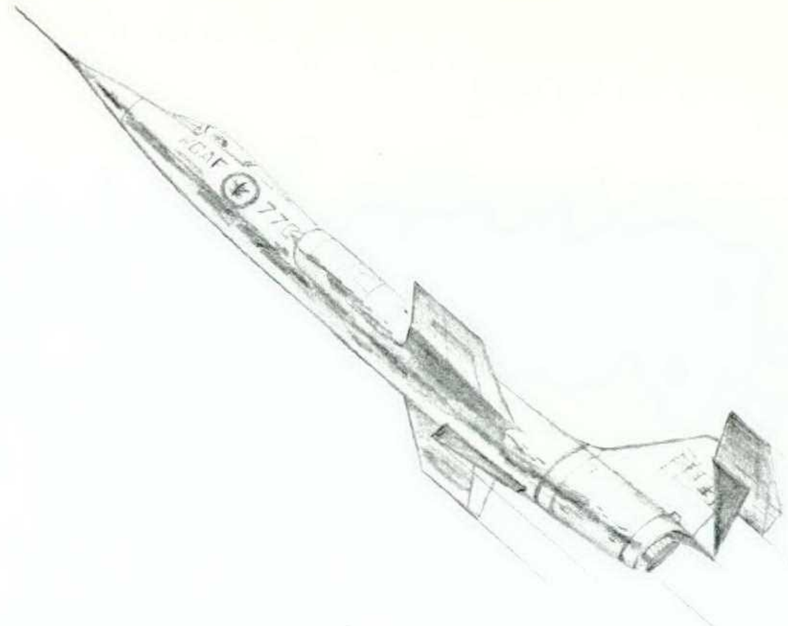
Ear protection must be worn to be effective. When in doubt as to the danger of the noise prevailing in your work area bring the matter to the attention of your supervisor. Deafness of any kind may interfere with your perception of speech and other sound signals. The failure to perceive a voice message correctly may result in a death or an accident or at least in an inefficient operation.

When in doubt about your hearing check with your Flight Safety Officer or Medical Officer. If you think you are suffering from temporary or permanent deafness, have noises or pain in the ear, suffer nausea, dizziness, during or after exposure to high-intensity noise you should report immediately to the Medical Officer.

The use of hearing conservation procedures and equipment can minimize or eliminate most of the hazards to the ear associated with exposure to high-intensity noise. Adequate protection can be provided for personnel exposed to continuous wide-band noise whose overall level is below 150 db. At the same time, in areas where the noise level is between 90 and 115 db better speech perception can be obtained by the use of ear protectors. The Air Force has provided you with the ways and means to protect your hearing. Now it is up to you.

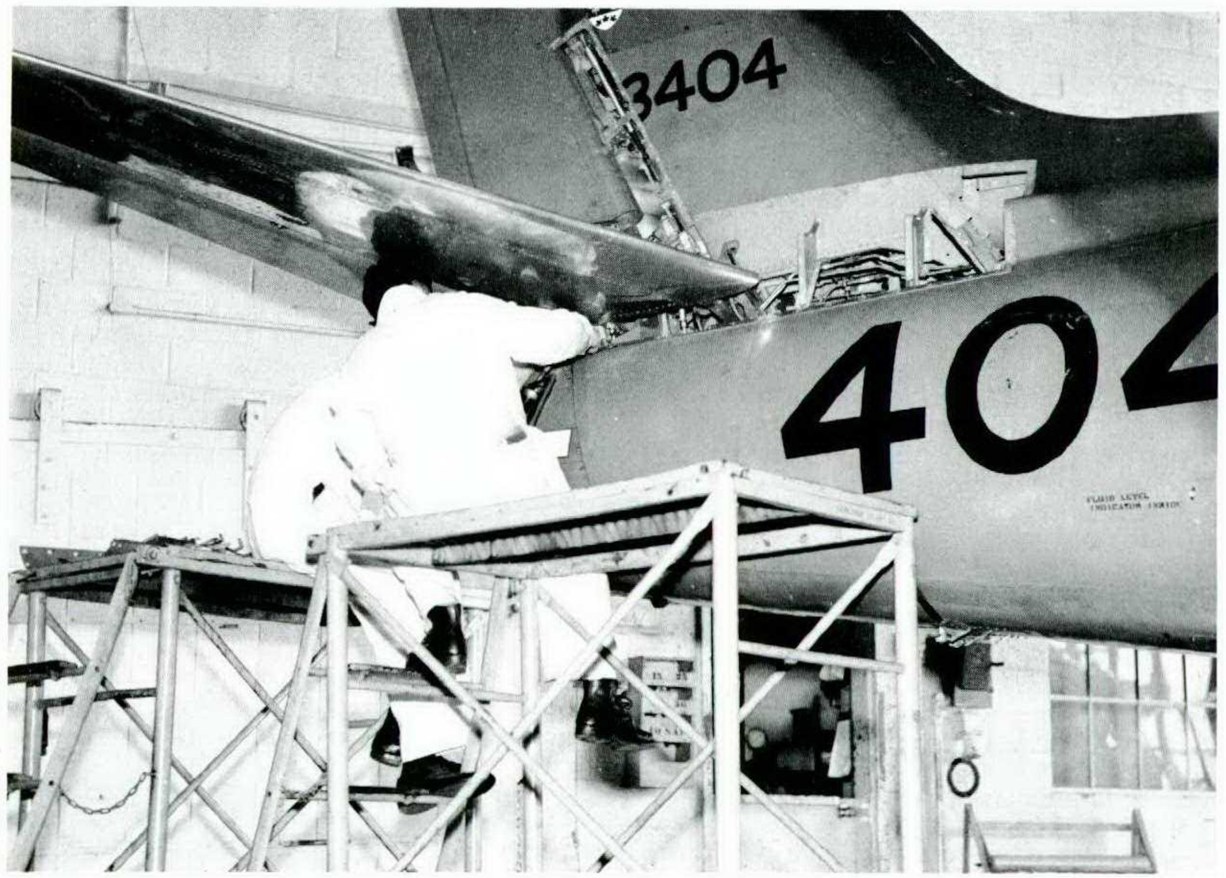


MAINTENANCE



Paraphrasing an old refrain, "why is it so" that the maintenance errors which cause flying accidents follow the same pattern month after month?

In the past few years new and complex aircraft in increasing numbers have been introduced into the service. It would be understandable, if not excusable, if it could be said that unfamiliarity with this equipment was the major cause of maintenance type accidents. We could then anticipate a reduction in the number of these accidents as technical personnel gained experience on the new types. But this has not proved to be the case. The complexity of the new equipment has not been responsible for the increase in the number of maintenance caused accidents. The main error today is the same type of error that was made in the days of the Tiger Moth.



There has also been a rapid expansion of the RCAF itself, combined with an increased flying commitment, both of which have necessitated a shortening of the training program for tradesmen and a reduction in the number of experienced personnel allocated to each of the flights. From a flight safety point of view such a condition is most undesirable and it was expected that an increase in maintenance accidents would be the unfortunate result. Again this was not the case, and we think it only appropriate that credit should be given to the tremendous job done by maintenance personnel since, in any program of expansion, it is they who carry the major burden.

Why, then, do we say that these facts have not contributed to the increasing maintenance accident rate? The reason is that the major cause of maintenance accidents has been and continues to be commission of those basic errors which a tradesman is taught to avoid in his very first lessons at technical training school: over-torquing of bolts; failure to properly secure a connection; failure to correctly fasten fuel caps, cowlings and inspection panels. Eighty per cent of the RCAF accidents whose cause can be traced to maintenance personnel are directly the result of these seemingly trivial mistakes!

Here in the Directorate of Flight Safety we never fail to be amazed when we learn of a technician who will repair a complex hydraulic system and then nullify his whole effort by improperly connecting a hydraulic line—a blunder which subsequently forces the aircraft to make a wheels-up landing; or of another technician who inspects and passes a jet engine as serviceable—and then fastens an inspection panel so poorly that it is torn off on the next flight. (Depending on her humor that day, Lady Luck may write off not just a panel, but an aircraft and crew as well.)

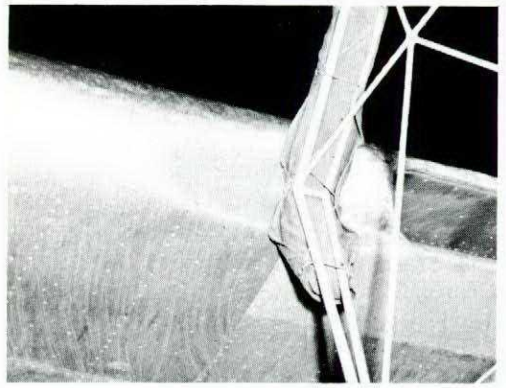
Accidents of this type would not happen if the technicians responsible paid more attention to the little things. As they say in the popular song, "Little Things Mean a Lot"—particularly when applied to aircraft accidents. As a matter of fact they mean the difference between a maintenance accident rate which we now consider too high and one which could be reduced, with a little care, to a negligible level.

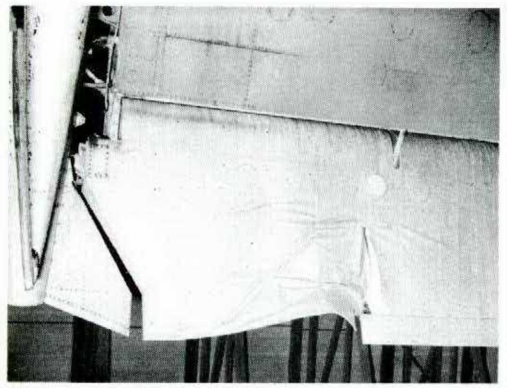
That the problem is a serious one we all agree; but at present we are at a loss as to the solution. Perhaps the cause is lack of supervision; but whether this is due to an insufficient number of supervisory personnel or to a superfluity of paper work which keeps them deskbound, we do not know. Whatever the immediate cause, the end result is the same. That direct supervision of work which ensures that the little things will not be neglected, is lost.

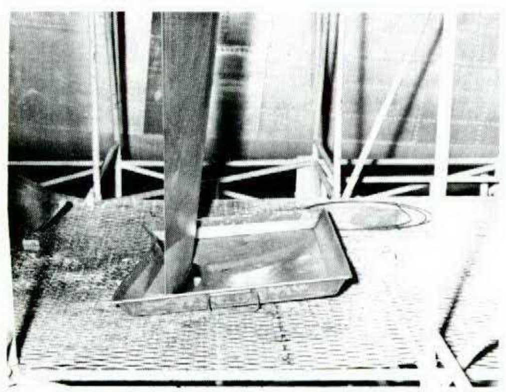
A certain amount of paper work is a necessary adjunct to administration in a modern Air Force; however, we feel that, for junior supervisors particularly, it must be reduced to the bare minimum. Personnel should spend a maximum amount of time on the floor—supervising. Paper work will increase from floor level upwards, but it should never reach the stage where even the engineering officer cannot spend a fair portion of the day away from his desk.

We do not know whether we've hit upon the crux of this problem. We do know that something must be done to reduce the number of accidents chargeable to maintenance personnel. Comments from personnel in the field are solicited both on the theme of this article and on a solution to the problem itself. Perhaps a critical analysis of your own organization will supply the answers.

NOSEWHEEL COLLAPSE







Three other areas where damage was sustained when the nosewheel collapsed.

During a No.5 check on a C119, an LAC AFTech2 was instructed to carry out a visual check of the nosewheel assembly and compartment. After the visual check he asked a fellow LAC what items were to be inspected. He was told of several items particularly the two bolts, one in the uplock and one in the downlock that were to be removed and inspected for wear, and referred to the dash 7A EO for further items.

Returning to the nosewheel compartment he checked the downlock safety pin in place, then removed the uplock bolt and replaced it with a new one. Discovering the downlock bolt to be unserviceable, he left it half-way engaged and went to obtain a new one. On removing the unserviceable bolt, difficulty was experienced aligning the new one and he noticed a gap of about 1/4 inch between the striker blade and the top of the strut. Checking the safety pin he found it sheared and partially disengaged and while trying to reposition it, the nosewheel collapsed pinning him in the nosewheel compartment.

Fortunately his injuries were slight but in less fortunate circumstances could have resulted in death or much more serious injury.

How, you might ask did this accident happen? Firstly, the LAC was instructed to do a visual check only. Secondly, he turned to a fellow airman for advice instead of to his supervisor. Thirdly, he did not refer to the EO and finally he did not use a jack.

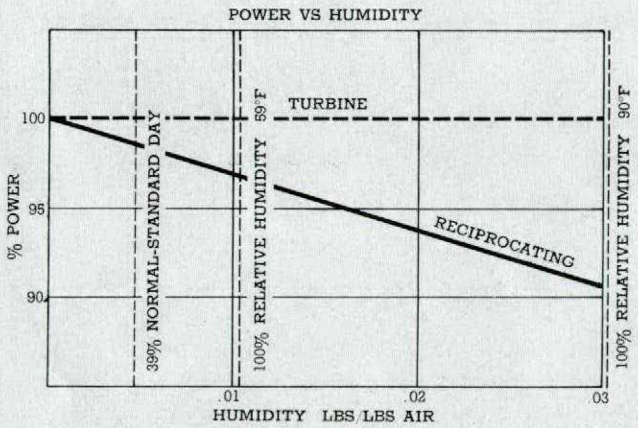
The use of a jack was not spelled out in the EO but surely when the nosewheel jack primary lock bolt is being removed the requirement for a jack should be obvious. Notwithstanding this, a warning to this effect is being included in the EOs.

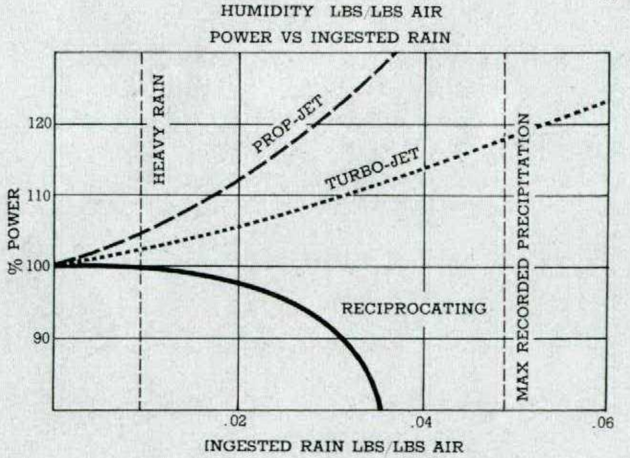
This accident covers all the common cause factors for ground accidents—Personnel - Poor Technique—Briefing - Inadequate supervision. It is good to be keen and conscientious but don't let your keeness lead you into an accident.

POWER VS Moisture

The two graphs give you a good picture of power vs humidity and power vs ingested rain for various breeds of engines. The piston jobs really lose out with either an increase in humidity or rain. The turbo jet and prop jet on the other hand get a real kick out of moisture.

Graphs by Mr. Sydney Berman, DFSR Norton A.F.B.





IN OTHER WORDS HANDLE WITH CARE

You don't get the increased speed of a jet for nothing. The high performance of the jets is hard to come by in the first place and may be even harder to maintain. High speed means thin airfoils and light evenly balanced control surfaces requiring minimum actuating loads.

Aerodynamic cleanliness is a must and has never been more important than it is on today's airplanes. Parasitic drag and leakage drag can and will constantly nibble away at this aerodynamic cleanliness. Even small discrepancies may become intolerable because of their drag effect which, as you know, increases as the square of the speed.

The amount of drag produced by a small projection or dent is six times greater at 500 mph than it is at 200 mph. Increased drag requires proportional increases in thrust, therefore, increased fuel consumption and decreased range.

It will be essential that all door gaps, seals, air leakages, aerodynamic smoothers, drain tubes, and cowling fits be maintained strictly in accordance with the best aerodynamic standards. Allowing drag build-up to continue unchecked will increase operating costs significantly.

USN: Approach

PRACTICE IFR

Follow IFR Procedures Even When Operating VFR—You don't have to follow IFR procedures if you are conducting VFR operations, but you cannot maintain instrument proficiency without practicing at every opportunity. Use all the navigational aids available and make accurate position reports.

USN: Approach

A conversation overheard during the lunch hour.

"Are you settled in your new job sir?", "Oh yes, I find myself at the office at 8 o'clock every morning. I am faced with making decisions all day. As a matter of fact I just haven't got time to think."

Arrivals and Departures

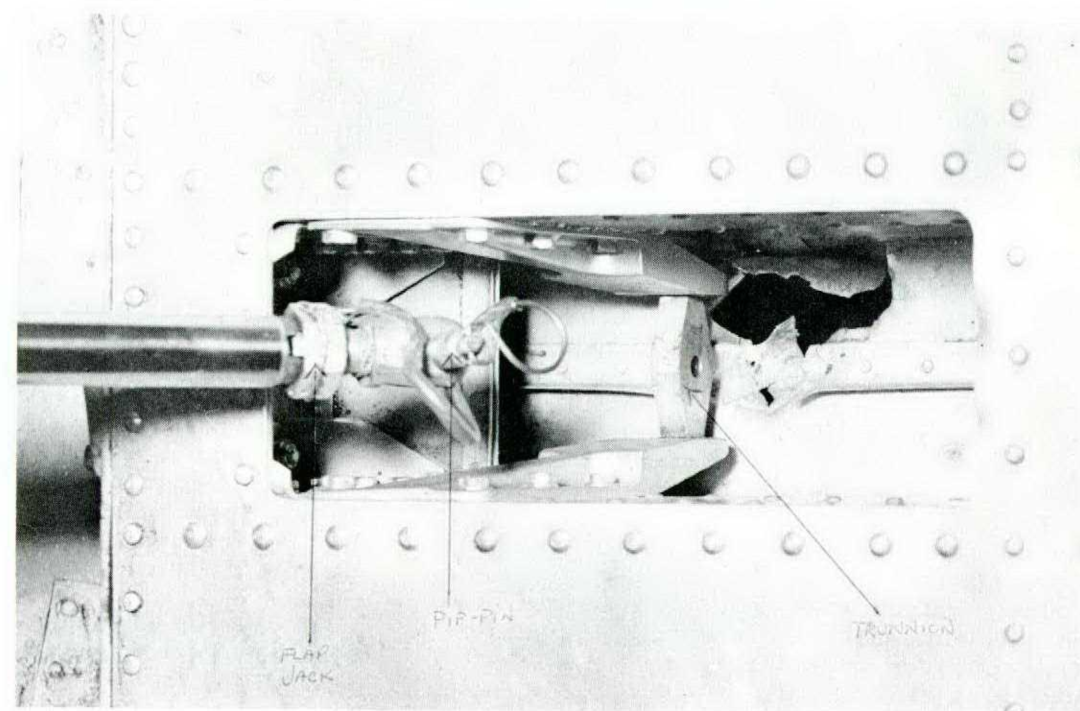
PIP PIN TROUBLE

A CF100 on a navigational sortie from St Hubert, landed at Bagotville for a 2-1/2 hour lay over. The aircraft was serviceable and required only fuel and oxygen during this period.

After a walk-around check and a normal flight the aircraft was landed at St Hubert, where it was discovered that the centre section flap jack had passed through the flap at the rear trunnion. There were no L14 entries to indicate that the flap had been lowered since the last PI, and the case was assessed against maintenance, unit unknown.

As an interesting sidelight to this case, some circumstantial evidence came to light in the nature of a conversation overheard in Bagotville. An airman was heard to be admonished for not lowering the battery of a particular CF100. He claimed he had performed the duty but was advised he had done it to the wrong CF100. The CF100 that suffered the accident was at Bagotville when this happened.

Fortunately, DFS doesn't assess cases on hearsay evidence, therefore, it remains maintenance, unit unknown.



WHAT PRICE CO-OPERATION?

An expeditor became completely encased in ice from freezing rain following an over-night stop at a civilian airfield.

During the de-icing operation, prior to departure, the supply of de-icing fluid was exhausted. The crew resorted to manually chipping off the ice. They were assisted in this operation by a USAF crew from a C47.

The captain of the Expeditor departed from the scene briefly to try and locate a Herman Nelson heater to de-ice the glass surfaces. On return he found several windows cracked and broken due to one of the USAF crew chipping at the ice on the glass with a rubber encased aluminum pipe.

The total cost of the repairs necessary, including six replacement windows, was roughly $475.00.

WHERE ANGELS FEAR

A takeoff was made in an Expeditor aircraft and during the climb to altitude the port engine failed at 4500 feet. The instruments in the cockpit indicated normal readings with no apparent reason for the engine failure. In a few seconds, before the engine was feathered, a thud was felt and the port propeller stopped, indicating a seized engine. The feathering circuit was activated and the propeller was feathered. The pilot checked the cockpit and could not determine why the engine had failed. He then changed the fuel selector to the front tank and UNFEATHERED the engine. After the propeller had unfeathered it did not move, so he tried to crank the engine with the starter. The propeller still did not move so the engine was refeathered. The aircraft was landed safely.

This case is worth a second look. It is obvious that the pilot of the aircraft did not recognize the fact that when the propeller stopped before feathering action was taken that the engine had seized. The temperature and pressures were indicating normal before seizing, therefore, the reason for the engine seizing was most likely to be an internal failure of the crank shaft, or some other internal failure that stopped the crank shaft from turning very suddenly. When an engine fails there is a tremendous force acting on the propeller that keeps the engine wind-milling. When the propeller comes to a sudden stop and does not wind-mill it follows that there is a tremendous force acting on the crank shaft to prevent the propeller from turning.

After suffering an engine failure under these conditions and being fortunate enough to get the engine to feather, it is extremely poor airmanship to try to restart the engine.

It must be realized that an internal failure sufficient to cause an engine seizure is apt to break oil lines and cause a complete loss of oil. Because the engine would feather in the first place does not mean that it would feather a second time. If the second attempt at feathering was not successful the drag caused by the unfeathered propeller is sufficient to make an Expeditor unflyable on a single engine. This crew was extremely lucky.

NO SWEAT

On takeoff in a C47 at approximately 50 feet and 90 knots, the engines became unsynchronized and the aircraft pulled to the left. A quick check of the gauges showed the RPM on the port engine dropping through 1800 - 1500 RPM. Control was maintained, 48 inches of MP applied to the starboard engine, the port throttle retarded and the engine feathered. The hydraulic selector was changed to the starboard engine and the undercarriage retracted. Speed was increased to 100 knots by lowering the nose and a slow climb out initiated at 100 - 110 knots. At 450 feet AGL, 110 - 115 knots was maintained and a slow turn was made back to the airfield where a successful single-engined landing was carried out.

This engine failure, suspected to be a CSU failure, occurred at a most critical point during takeoff, but by knowing and applying the correct procedures the pilot turned an emergency into a routine single-engined landing.

Could you cope under similar conditions? How would you make out if it happened on your next takeoff?

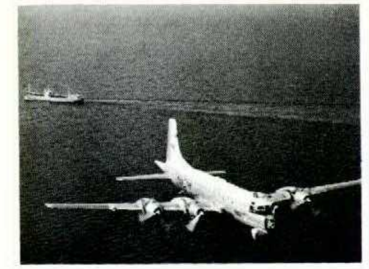
F.O.D.

A Dakota was being air tested after a starboard engine change. The engine checked OK on ground run, but after takeoff vibrated badly. A check of the ignition analyser revealed that the No.3 cylinder rear spark plug was not firing. Power was reduced but the vibration persisted. The engine was heard to back-fire and the aircraft was returned to base.

On inspection, the spark plug and piston of the No.3 cylinder were found to be damaged apparently by a piece of metal (foreign object) of undetermined size and origin which had been ejected through the exhaust port of No.3 cylinder before the subsequent dismantling.

Because of a loose spark plug insert on No.9 cylinder, this engine had been UCR'd on receipt from the manufacturer, and No.9 cylinder was replaced before the engine was installed on the aircraft.

How a foreign object could get into the No.3 cylinder, or for that matter any cylinder, of a newly overhauled engine, is hard to understand. The fact remains, however, that it was there.



CIVILIAN CONTRACTOR

After a Functional Flight Test by the contractor and while on the landing run, one engine was seen to be smoking badly. After shutdown it was discovered that the power recovery turbine had failed. Further investigation revealed a bag of moisture absorbing material had been left in the cooling ducts and had been drawn into the PRT.

Apparently the contractor has been placing these bags in the PRT hood and cooling ducts for years, removing them before flight, this one, however, was missed on preflight inspection.

A contributory factor, (and this might sound familiar to some) was the absence of streamers or strings on this particular bag. Suffice to say, that an amendment to their Functional Flight Test Procedure appeared almost immediately following the incident.

MAINTENANCE SUPERVISION

During a pre takeoff runup in a Neptune aircraft the pilot noticed a puff of white smoke emit from under the inboard cowl flap of the port engine. The smoke persisted and a visual inspection revealed a considerable oil leak. The engine was shut down and the aircraft returned to the ramp.

Investigation revealed a rocker box housing cover nut found directly behind No.6 cylinder rocker box housing. The rocker box cover on No.6 cylinder exhaust rocker box housing had fractured, and a half inch hole was found.

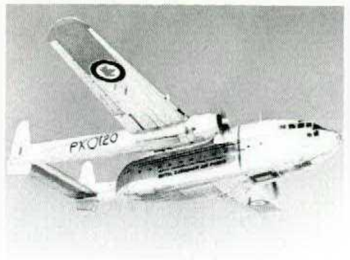
Records indicated that No.6 cylinder had been changed 37 flying hours prior to the incident and new glands had been installed in this cylinder two days before the nut was found. It was determined that on the second occasion when the nut could have dropped behind the cylinder, a crew change had taken place before the work was completed. This means that there was a period of three hours when the work was left unattended and a rocker box housing was not covered, in other words, one crew removed the rocker arm cover and another crew reinstalled it.

Since this incident, a crew is required to stay on the job until the work is completed, and if this is not feasible, the new crew is given an overlap period of one hour. The purpose of this procedure is to ensure that any job will not remain unattended and that misunderstandings do not arise with regard to the work remaining.

REDUCE COMMUNICATIONS

Tower Controllers (in this instance, at Chicago Midway Airport) report that pilots can help reduce communications on approach control by advising on their initial contact, that they have wind and runway data. (Some refer to these as "the numbers"...either is okay.) This procedure would be appreciated by tower operators in all high-density areas.

USN: Approach



FORK TROUBLE

In the last year, eight ground accidents were caused by loading vehicles being driven into aircraft. The pattern has been consistent. The upper frame of a fork lift or similar vehicle comes in contact with a tail assembly, the wing or the fuselage. However, something new has been added. Recently a fork lift was driven into the propeller of a C119.

Let us examine the events that led up to this accident. A loading crew were on duty at an AMU with an airman, Trans Tech, group 2, designated as airman in charge of the crew. Included in the crew were two airmen who were employed on useful duties pending course. The board of investigation into this accident indicated that one of the Trans Techs in the crew was a group 3 technician. Why a group 2 technician was put in charge of a group 3 technician was not explained.

The group 3 technician and the two airmen were instructed to load six boxes of AOG equipment, with a total weight of 30 pounds, into a C119. The three airmen loaded the six boxes on the fork lift and proceeded to the aircraft that was parked on the tarmac where the pallet was loaded through the port paratroop door. As the trans tech group 3 started to tie down the boxes of freight, he noticed that he was going to run out of tie down material so he asked one of the airmen, who was on useful duty, to get some more. We don't know how much tie down equipment is required for 30 pounds of freight but surely sufficient equipment could have been taken to the aircraft to finish the job in the first place.

The airman left the aircraft, climbed on the fork lift which was parked by the port paratroop door, and backed up to the rear. He stopped and shifted into forward gear and started ahead, keeping to the port side of the aircraft outboard of the boom. He lowered the fork lift and was keeping a sharp lookout on the port side for a fire extinguisher which was located at the port wing tip. The vehicle collided with the port propeller.

A local Order had been issued by this unit that all C119 aircraft must be loaded through the main entrance on the port side, forward of the propeller. This Order had been issued because aircraft were being damaged by fork lifts working in the cramped area between the booms and the fuselage. In this case the Order was contravened.

During the investigation the driver of the fork lift was asked if he had a DND 404. He said that he did not have one and prior to the accident did not know that such a thing existed. When questioned as to how he had learned to drive the vehicle, he said that he had learned to drive on his own while at AMU. From this it would appear that this airman and possibly others were allowed to drive the fork lift on many previous occasions.

The investigation revealed a lack of proper briefing to airmen who were usefully employed at the unit. It also revealed lack of proper direction and supervision on the part of the supervisory staff.

It is unfortunate that, in many cases it takes an accident to reveal the deficiencies in an organization. It behooves all of us to take a long searching look at our own organization to see if perhaps we couldn't be caught the same way.

LIFTLESS

Major W. de Kitkat-Watney's Nieuport Scout was extensively damaged when it failed to become airborne.

The original Court of Inquiry found that the primary cause of the accident was carelessness and poor airmanship on the part of a very experienced pilot.

The Commandant General, not being wholly convinced that Major W. de K-Watney could be guilty of so culpable a mistake, ordered that the Court should be reconvened.

After extensive inquiries and lengthy discussions with the Meteorological Officer and Astronomer Royal, the court came to the conclusion that the pilot unfortunately was authorized to fly his aircraft on a day when there was absolutely no lift in the air and could not be held responsible for the accident.

We extend our congratulations to Major W. de Kitkat-Watney on his reprieve and also on his engagement to the Commandant General's daughter which was announced shortly before the accident.—Flight Safety, RAAF. Reference Summary of Aircraft Accidents July 1917.

PLUGGED

An LAC AETech had finished a runup on a Sabre aircraft. He then walked over to a second Sabre which was to be run up. A second LAC AETech had an energizer plugged into this Sabre and everything appeared ready for the runup. The first LAC climbed into the cockpit and after waiting for an electrician, who was standing on the wing to finish his checks, he proceeded to start the engine. During the start the electrician tapped him on the shoulder and pointed to smoke emitting from the tailpipe. the engine was shut down.

Investigation revealed that the tailpipe dust plug was still in position. The AETech handling the energizer was in charge of the operation and obviously did not complete an external check of the aircraft. The LAC who started the engine certainly did not do an external check, but when he saw his buddy on the energizer, thought that a check had been completed. Result—the entire aft section of the aircraft had to be replaced. There is one further factor involved that could have had a bearing on this accident. There were no red streamers attached to the dust plug. In all probability, if these streamers had been in place the presence of the plug would have been readily apparent to both these airmen. This is another situation where seemingly minor omissions lead up to an accident.

ASKING FOR IT

While carrying out a circuit in an Albatross it was noticed that the nosewheel indicator showed "unsafe" after a down selection had been made. The undercarriage was recycled and on this occasion all three wheels indicated down and locked.

At this point the pilot decided to recycle the gear to see if further difficulty could be expected. After recycling, the nosewheel indicated an intermediate position. A further attempt to lower the nose gear by the use of the emergency hand pump failed. Finally the hydraulic selector was returned to the engine pump position and the nosewheel indicated down and locked. A normal landing was carried out.

This incident was caused by an improper adjustment of the nosewheel down lock micro switch. This pilot was fortunate that the trouble was of a minor nature and that he was able to get the gear down and locked. After experiencing difficulty in the first place and getting a safe indication recycling the undercarriage in the air to check its operation, is just asking for trouble. The place to find out if further difficulty can be expected in on the ground during a retraction test and certainly not in the circuit.

LOOK OUT BEHIND

Before starting up a CC106 an external check was carried out. It was indicated that chocks were in place on the main gear. When No.2 engine was started it was noted that the hydraulic pressure was not indicating on the gauge. Because of previous experience with this hydraulic system, the pilot had reason to believe that the gauge was reading incorrectly. He started the remaining three engines. The groundcrew on the intercom informed the pilot that the aircraft was moving. The pilot instantly assumed a forward movement and selected some reverse thrust. A quick visual check revealed that the aircraft was in fact, moving backwards, so the reverse thrust was neutralized and the engines shut down.

Minor damage was caused to the aircraft's skin and to the ground handling equipment. The absence of hydraulic pressure was the result of the main unloading valve being left in the manual unload position. In this position the main hydraulic system will not pressurize. There were other factors involved in this case, but as they detract from the lesson that can be learned, they cannot be discussed further. It was learned that in the ground idle position the propellers of a CC106 produce reverse thrust. The corrective action that was taken by the unit was to issue an instruction that the aircraft be chocked front and back before starting, and more important aircrew and maintenance personnel were instructed that the main hydraulic system must be pressurized before the engines are started.

STARRY STARLINGS

Flight Safety Foundation joins with the CAA in hastening to advise aircraft operators that this is the lovey-dovey season for starlings! Within the past few days we have been told of two aircraft, a DC-3 and a DC-4, that "grew" birds' nests in their airscoops after sitting out in the parking area for a day or so.

Nests built in the airscoops of aircraft may be conducive to love bird-style, but not to flight, people-style. If your airplane has been parked on the ramp or sitting out on the hangar apron for a few hours, check those airscoops before you fire up. The nesting season is now...and airplanes are not for the birds!

Flight Safety Foundation

LETTERS TO THE EDITOR

Dear Sir

Your photograph on the inside cover of the Mar-Apr 61 issue of Flight Comment is most eye catching and timely.

However, it is to be trusted that readers will not be lulled into a false sense of security that the mere insertion of double chocks will miraculously preclude aircraft movement.

It has been long recognized that our aircraft chocks do not grip firmly, if at all, on concrete or ice surfaces. In fact "biting" of the tire on the inner edge of the chock is a must to ensure setting of the chock points into the terrain or surface.

Instances can be cited within the past couple of years where aircraft, double chocked as your photo shows, have rolled considerable distances pushing the chocks with the wheels.

When double chocking against climatic conditions it is most essential that the chocks be properly placed and firmly lashed together, on either side of the wheels, in a manner which will reduce wheel rotation and the accompanying chock skidding to the minimum.

H.D. Harragin, WO1
TCHQ

(Servicing take note.—ED)

BLACK ALERT

An unusual incident recently occurred in which a starling flew into a hangar with a lighted cigarette butt in its beak, then dropped the lighted butt on the hangar floor (no doubt startled by the no-smoking signs).

This incident could have been serious, had the lighted cigarette fallen into something flammable. All personnel of the squadron concerned have been rebriefed on the importance of extinguishing cigarettes before discarding them.

Recommendations: a. That the practice of selling cigarettes to birds, (starlings, black) be discontinued. b. That the Personnel Officer procure twelve cats (alley, sure-footed) on an indefinite loan for the purpose of stalking down the birds, (starlings, black).

FLIGHT COMMENT

ISSUED BY

DIRECTORATE OF FLIGHT SAFETY

R.C.A.F. HEADQUARTERS • OTTAWA • CANADA

July • August 1961

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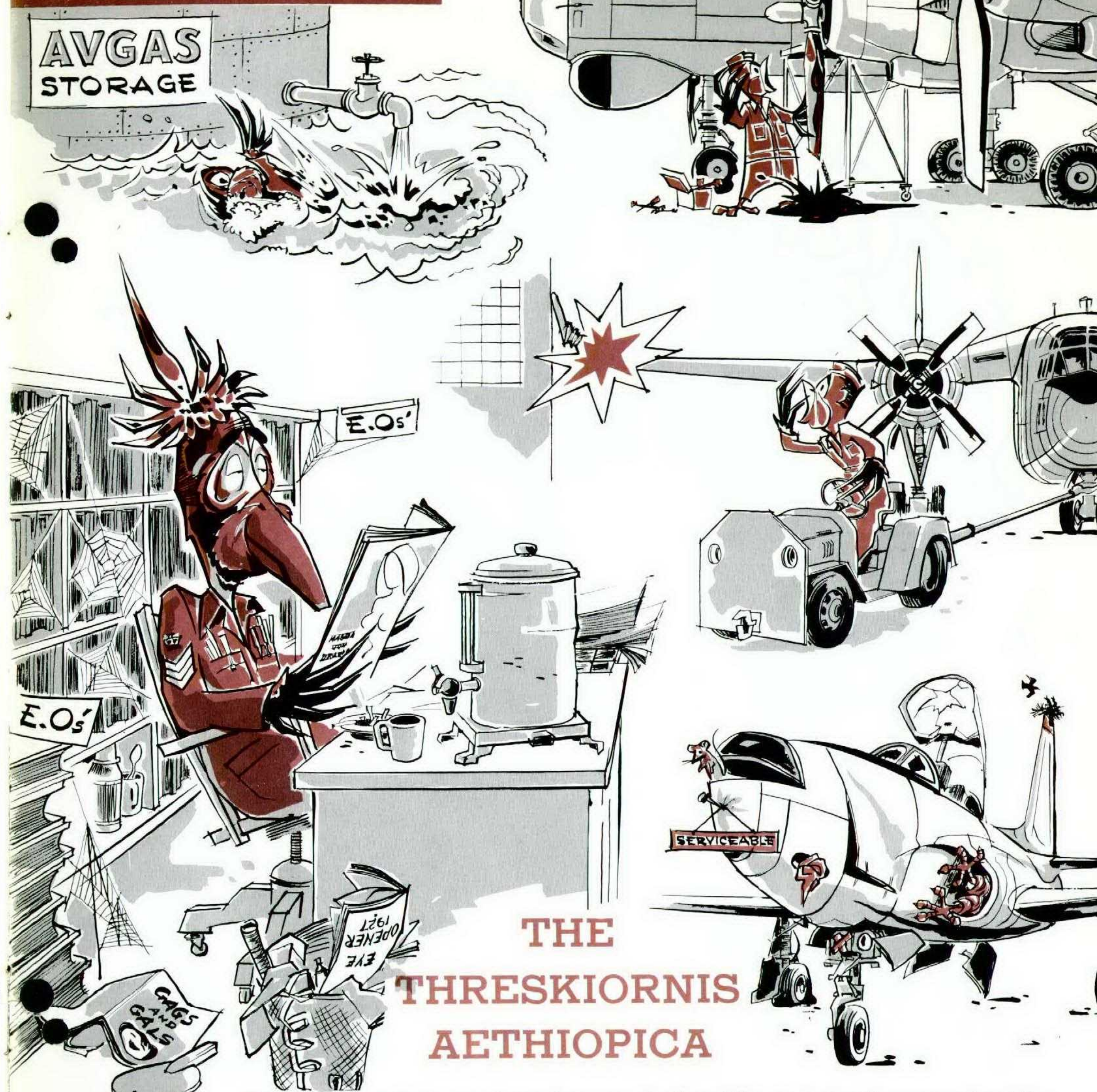
BIRD WATCHERS' CORNER



THE THRESKIORNIS AETHIOPICA

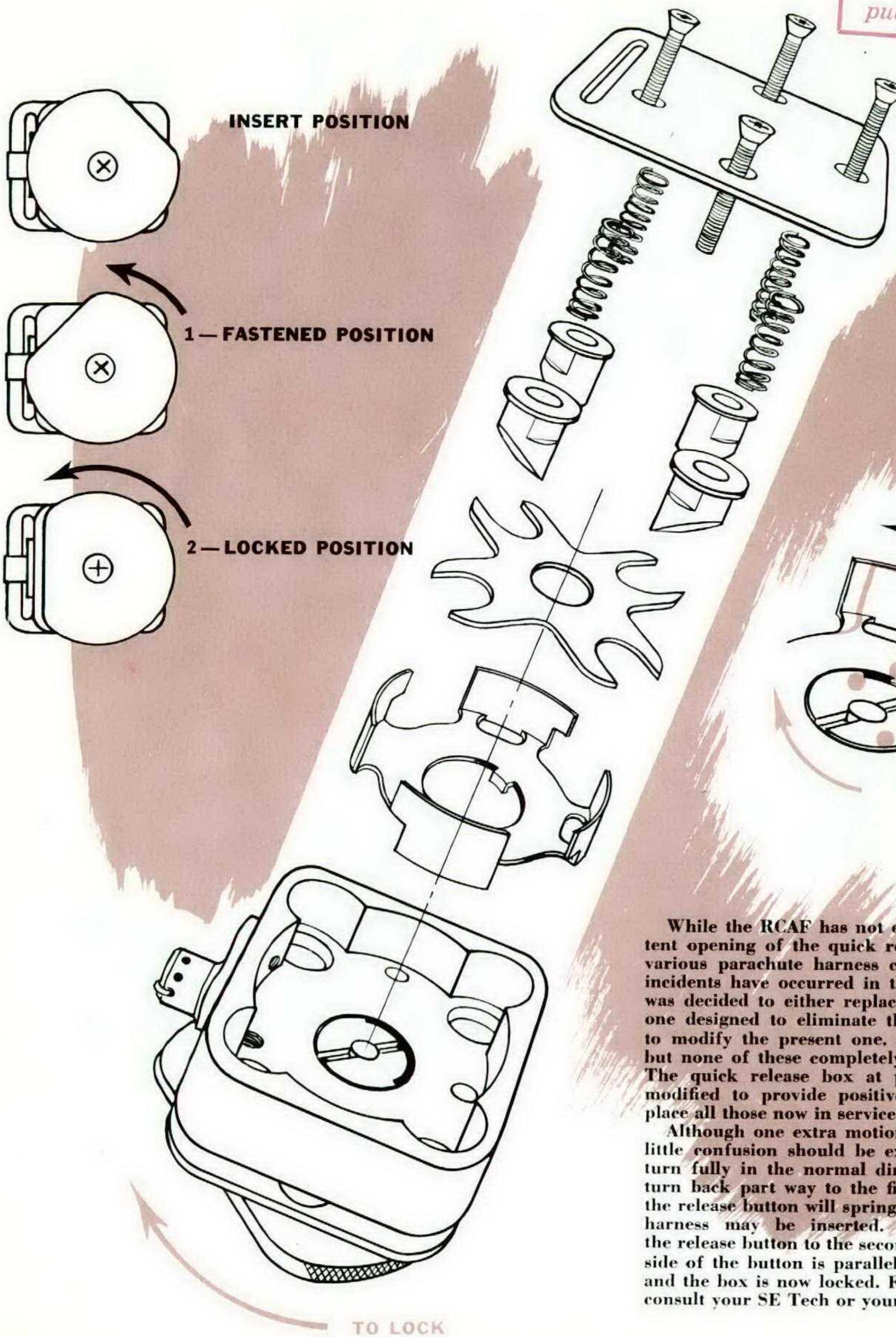
The Threskiornis Aethiopica, better known as the Sacred Ibis, is the best known species of the Ibis family. Long ago its habitat was the Nile Basin where it was venerated by the ancient Egyptians. Through evolution its habitat has changed from the Nile Basin to a small cubicle in some remote corner of any nesting grounds where iron birds congregate while undergoing repairs. Their primary duty, other than PMC of the mess, PMQ council, curling club, bowling club, 5 o'clock club, 6 o'clock club and 7 o'clock club is to direct the fledglings of the flock who rejuvenate the resting birds.

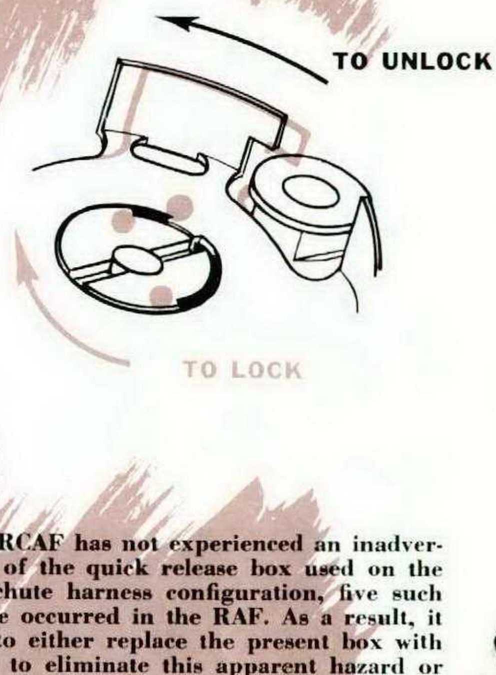
Although venerated by the flock, the fledglings caused them great consternation by not referring to the bird book, known to some as the EOs, while carrying out repairs. This results in bent and bruised birds cluttering the nesting grounds and loud wails from the flock leader.

Their call is loud and raucous:

CHECKTHEEOCARRYOUTA2JCHECKTHEEOCARRYOUTA2J

FOR SAFETY'S SAKE LOCK YOUR PARACHUTE Q.R. BOX





While the RCAF has not experienced an inadvertent opening of the quick release box used on the various parachute harness configuration, five such incidents have occurred in the RAF. As a result, it was decided to either replace the present box with one designed to eliminate this apparent hazard or to modify the present one. New boxes were tested but none of these completely met the requirement. The quick release box at present in service was modified to provide positive locking and will replace all those now in service.

Although one extra motion has been added, very little confusion should be experienced. To unlock, turn fully in the normal direction and press, then turn back part way to the first click at which time the release button will spring out and the lugs of the harness may be inserted. When complete, turn the release button to the second click or until the flat side of the button is parallel to the side of the box and the box is now locked. For further information consult your SE Tech or your FSO.