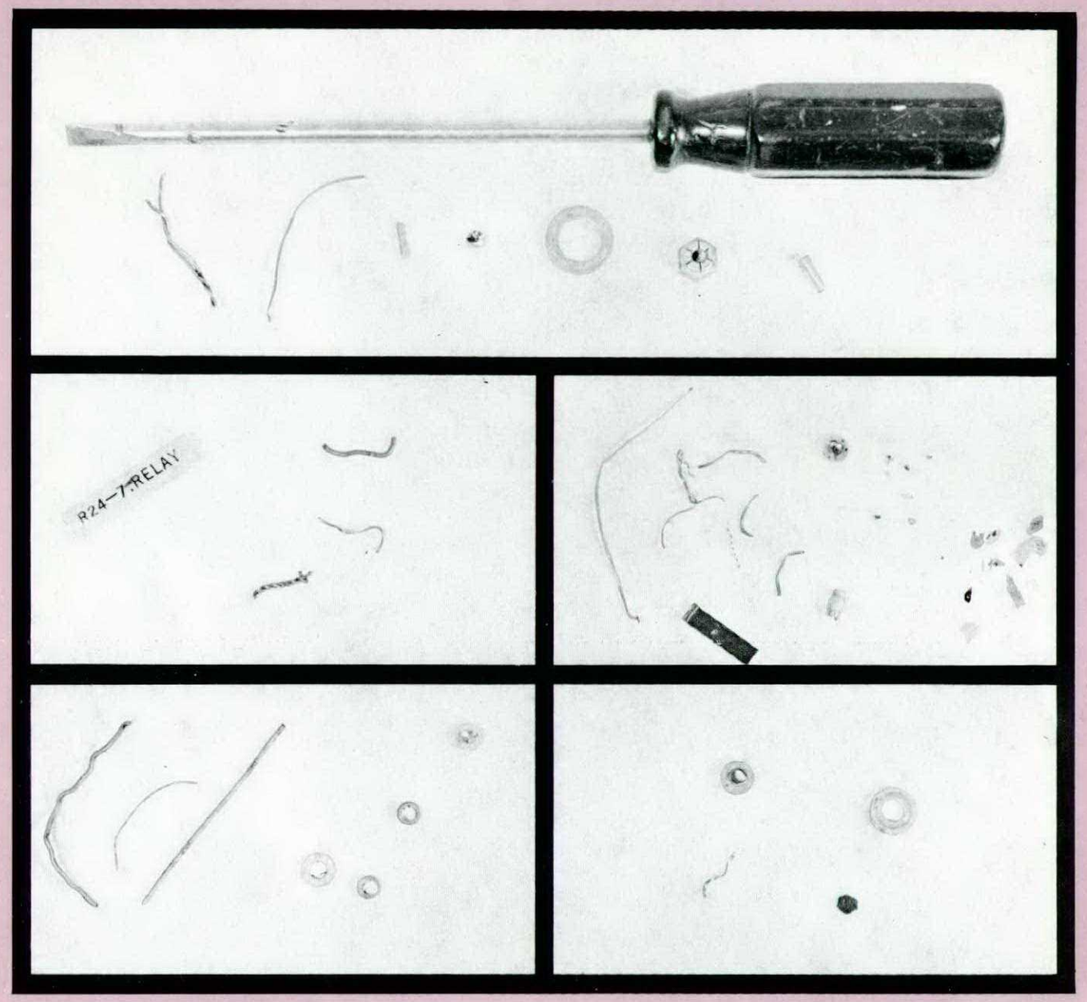
FLIGHT COMMENT

ROYAL CANADIAN AIR FORCE

May • June • 1960

*FOD



A unit in ADC initiated a program to eliminate FOD. All aircraft are thoroughly inspected at every opportunity, and their efforts are producing results. Any of these items pictured here could have caused an accident.

Have you an active FOD program?

***FOREIGN OBJECT DAMAGE**

EDITORIAL

In recent months there have been many indications that the initiative in Flight Safety activities is now being accepted at all organizational levels. Safety directives from commands to units, minutes of command and unit flight safety meetings, production of safety educational material at unit level and the introduction of flight safety topics into other RCAF magazines all indicate that the theme "flight safety is everyone's business" is being subscribed to all down the line.

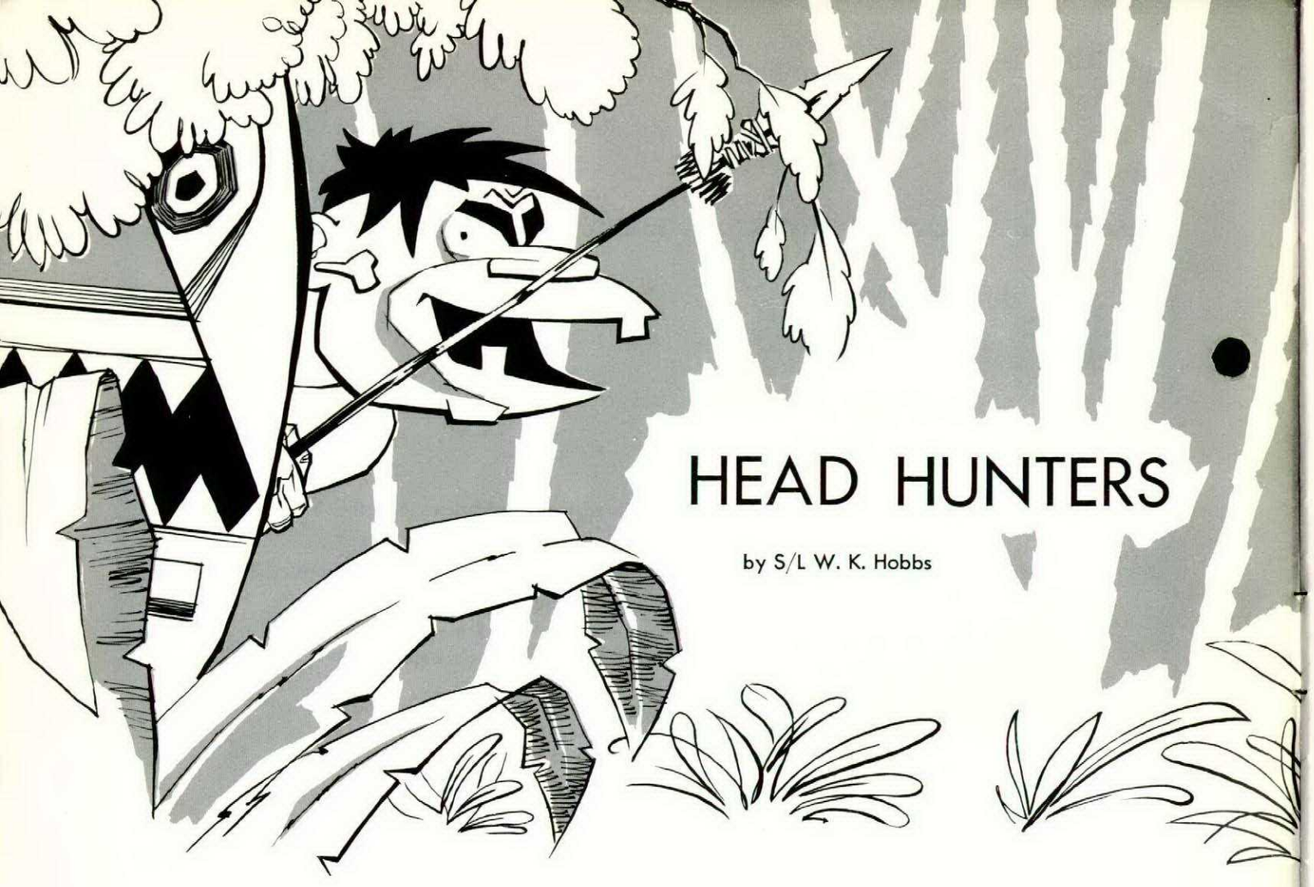
These are encouraging signs at a time when the accident rate is at an all time low and when comments such as "where do we go from here?" and "can we afford to be this safe?" crop up all too often in flight safety discussions. We *can* afford to be "this safe" and some organizations have decided "where to go from here". The facts are, that with few exceptions the serious accidents that still occur are avoidable and most can be prevented within command and unit resources. Improved supervision and higher aircrew and technician standards are old themes, but they still embrace the most profitable accident prevention areas.

If your organization has had serious accidents or potentially serious occurrences in the past year, examine the cause factors. Were these accidents avoidable? Could your supervisory staffs have taken action that would have prevented or made these occurrences less likely? Was anything lacking in the standards or ability of your aircrew or technical personnel?

If your answer to any of these questions is "yes"—and if you are honest with yourself, it will be—then you know that we can afford to be "even safer" and you have found your answer to "where do we go from here?"

John J. Jordan

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



HEAD HUNTERS

by S/L W. K. Hobbs

Either blind loyalty or this curious title has just lured you into reading at least the opening sentence of this short article. In any case keep going. There may be something in this for you. The subject head hunters are neither the South American dart-blowing kind nor the irate group captain kind. They are much more common and well known, the many micro-organisms (let's call them germs) that invade the nose, throat and other areas of the upper respiratory passages of humans. We all have periodic, unwelcome visitations from these little creatures. No one is immune to occasional colds, sore throats, or other inflammatory annoyances. Even 'tigers' get runny noses.

So what does respiratory infection have to do with air operations or flight safety? Anything that affects the capabilities of service personnel must ultimately influence flying safety and efficiency in some way. Perhaps the relationship is not so direct or dramatic as in the case of aircraft materiel failures, errors of flying judgment, bad weather, fatigue, or any of the other cause factors to which we frequently attribute flying accidents or inefficiencies. But in an insidious manner these infectious agents contribute to lowered aircrew performance and to less diligence in the supporting ground personnel. They also make aircrews more vulnerable to some specific ill-effects of the usual environmental stresses of flying.

In these days of equipment and procedural perfection, should we not be making a more critical examination of the many complex factors contributing to human error? Anything that detracts from an individual's full mental and physical capacity places that individual closer to an error of perception, judgment or action. Just as a number of small defects in an aircraft may combine to produce a large malfunction, in human activity the summation of little influences may result in the big error. Germs are little things. Let's see how they bite us.

There are many germ types that may affect humans. Their proper names, descriptions, distributions, and behavioral characteristics are of interest only to the medics. Many of these germs are friendly or at least innocuous most of the time; other germs are notoriously hostile. Most of them enter the body through the mouth or nose either air or water borne. They learned the art of aerial and underwater warfare before we did. Regardless of their ultimate or favourite site in the body many of the invaders first show themselves in the nose and mouth tissues. This is why upper respiratory infections, either as distinct diseases or as the dominant or first feature of a more general infection, are the commonest and the most expensive diseases of man; fortunately they are not the commonest cause of death. These diseases are, therefore, a worthy topic for comment in relation to their effect on safe and efficient air operations.

The most successful hunter is the common cold virus. Probably it acquired this name because it often follows upon exposure to cold or damp weather. Other names such as acute coryza, catarrhal fever, rhinitis, pharyngitis, laryngitis, tracheitis, or bronchitis, are less familiar but it is the same miserable little disease regardless of name or region chiefly affected. These names may also be used to describe infections due to other germs. We are all acquainted with the symptoms which occur in varying frequency and severity: the burning and itching of the nose or throat; the chills and feverishness; the aches and pains of the face, head, back and extremities; the inflamed eyes and nose; the swollen, stuffed nasal membranes with copious, watery discharge; the husky voice; the loss of smell, taste and appetite; the painful swallowing and dry, burning cough; the depression, the weakness and the lassitude. People in this sad state can be found anywhere, at work, on the streets and buses, in aeroplanes. Less often are they found at home in bed. A close relative of the cold is influenza. It has similar but more severe symptoms and is more inclined to be epidemic. Add to these the other diseases such as measles, scarlet fever and polio, which all look like a cold at their onset, and it is apparent that the hordes of different viruses and bacteria responsible for these ailments are in constant warfare with us. Both man and germ suffer heavily in these conflicts, but fortunately lengthy periods of truce permit each side to recuperate for the next engagement.

In addition to the common viral infections there are a number of bacterial organisms such as the well-known 'strep' and 'staph' which invade the tissues and cavities of the respiratory system giving rise to more serious inflammatory or abscess-forming infections of tonsils, sinuses, ears, throat or lungs. These however are the complicating, secondary invasions of the mucous linings of these areas which have been weakened and made more vulnerable by a preceding 'cold' war. These bacteria may even have been friendly residents of the tissues until the disorder of the viral war provided them with the opportunity for the scavenging and looting role. The bacteria, however, are usually easily destroyed by one of the specific antibiotic drug treatments whereas the viruses are unaffected by such measures. It is a misconception that colds and flu can be cured more quickly with the anti-germ drugs.

To further complicate the picture of infectious disease incidence there are a few non-infectious conditions of the nose, throat or sinuses which masquarade as infections. Typical of these are the allergies such as hay fever which in spite of its name is not a fever although the general debility may be severe and prolonged. Irritations from smoke or dust are locally distressing but without sickness. And, for shame, there are some afflictions which, like grandmothers' funerals, are imaginary but convenient.

If you have had the fortitude to struggle through this brief micro-biological, pathological and sociological dissertation you may still ask patiently, "What has this to do with safe flying?" There are obvious reasons why respiratory infections may indirectly, affect the general efficiency and therefore flying safety but first let us consider those aspects which involve aircrews and so affect flying safety directly.

Infections have a disabling effect on the body as a whole although this may not be so apparent with minor infections such as colds. The severity and extent of the disability arising from any one type of infection varies from person to person and from infection to infection. It depends on such factors as; level of immunity and fitness, virulence of the germ, habits and mental attitudes, and motivation to work. Some people are crippled by colds and stay close to the hearth; others are seemingly unaffected and weather it out on the job. Most victims make a day by day decision. They have a strong urge to check in each morning and so they become committed for the day. We are familiar with the lassitude, weakness and loss of mental acuity accompanying these infections. This would have little effect on occupations requiring a minimum of human capability. But in aircrew normal demands on physical and mental faculties are heavy and the reserves beyond what is normally required of aircrew represents their margin of safety for unusual

hazards. When these reserves are dissipated in resisting a germ invasion the individual is drawn closer to a point where a flying situation can exceed his capacity to avoid or control it. When the big test comes he isn't all there.

Distraction or inattention is an important cause of flying accidents. There are few occupations that demand as much continuous skilled attention to a constantly changing, broad environment as flying. Any degree of inattention is dangerous. Although minor illness is only one of many possible distractions it is a serious one because it directs or attracts attention inward where it is less likely to be recalled by outside events. It may be accompanied by self-pity or some other emotion associated with the illness which in themselves are distractions. There may also be competition

in priority of action. The momentary compulsion to blow one's nose to avoid looking like a wet-nosed two year old may be more overpowering than the immediate need to operate a control; or the comfort-seeking urge to avoid turning an aching head, or to speak with a sore, hoarse throat, or to read a chart with burning, watering eyes may be greater than the need for safety that dictates these procedures.

The problem of clearing or equalizing pressure differentials between the ears or sinuses and the changing cabin pressure, particularly during descents from high altitude, is well-known to aviators. Failure to relieve the pressure during or right after flight can lead to the painful, deafening conditions known as aero-otitis media and aerosinusitis or collectively as barotrauma. Difficulty in ventilating the middle ear or sinus cavities can be caused or greatly aggravated by the inflammatory swelling of the openings of the small tubes connecting these cavities to the nose passages. Such swelling always accompanies throat and nose infection. Further the infection may be sucked into the ears or sinuses by the pressure-equalizing inflow of air during descents and, if superimposed on the damage from baratrauma, can produce a serious secondary infection. These mechanisms perhaps more than any other have provoked the strongest cautions from medical officers regarding flying with colds. The increasing use of continuous 100 per cent oxygen during high altitude flights, especially with liquid oxygen systems in which the supply is abundent, tends to increase the damage from baratrauma because of the post-flight absorption of the oxygen into the mucous membranes of the blocked cavities and the consequent deepening of the negative pressure. It has also been observed that disorientation or vertigo may be induced or worsened by ear pressure in flight. The flyer is not only risking a prolonged period of grounding due to baratrauma and secondary infection while flying with a cold but may also be at serious risk during the flight due to the immediate disability. The extreme pain, and possibly vertigo caused by a blocked ear during a rapid letdown may seriously interfere with a pilot's usual keen sense of discrimination of his eventual point and manner of ground contact.

The dangers of self-medication warrant re-emphasis. For aircrew, if not for everyone, the attempted cure of an ailment may be worse than the ailment itself. A great variety of new and wonderful drugs have appeared in recent years—pain-killers, germ-killers, pep-uppers, slow-downers, anti-swellers, anti-itchers, anti-airsickness, anti-fat, anti-tired blood, etc. Most of them are very useful if taken as advised and as intended. But often they are used otherwise. Nearly all drugs have some undesirable side-effects even in normal use. Drowziness, dizziness, nervousness, visual disturbances and rashes are common. Even the simple aspirin is not innocuous. While these may be acceptable in most ground situations they are far from acceptable in the exacting flying job. There are exceptions but a good rule is, if you are sick enough to need or think you need medicine then you are too sick to fly. Other than the case of a bacterial infection in which a carefully chosen antibiotic drug may be beneficial (and let your MO choose it), it is doubtful whether any medicine can affect the natural course of the common cold or flu. They may make you feel better but this is not the same as being fit for flying purposes. Alcoholic medicine is in the same category and we all know of its side and after effects.

And what of the impact of respiratory infections on the general service population? It is the same as that of any illness on any venture involving the consistent skills of many people. Manpower planning can allow for average, long-term wastage in all trades, but it cannot predict or protect against the peaks or epidemics of disease that cripple work output. This concept explains the emphasis on 'germ warfare' research at present. Preventive vaccines hold some hope but are not yet perfected. Where essential work is rigidly scheduled postponements are not always possible so fewer workers must produce the same output or, conversely, sick men must carry on. In either case quality suffers. In the aircraft trades this is reflected

in omitted, incomplete or poorly supervised maintenance and servicing. And as the boys who fly the aircraft have the same disease problems they are less able to handle any errors passed to them.

Ironically perhaps the greatest danger of viral respiratory diseases is that they are not serious or dramatic in the medical sense. Unless complicated by secondary infection or some other pre-existing disease, they are generally regarded as temporary annoyances rather than sickness and their skill-robbing potential is ignored. How often have we heard the expression, 'It's just a cold'? The cold sufferer doesn't get much sympathy and is often an object of amusement or ridicule. On the job he annoys his fellows by being dull, indolent and ineffectual and by exuding the obvious evidence of an infectious carrier. His absence from work is equally unpopular since his work is undone or some one else has to do it. Even the domestic scene is not all tenderness and love.

There is no simple or complete solution to all this. Germs will likely continue to dominate the disease field for a long time; we have to live with them. Part of the solution is to be aware of the subtle hazards of these organisms and this is the prime purpose of this message. When the bug hits, the rule of not working at any complex, highly skilled job and in particular not flying, is still valid, but it is difficult to be inflexible. Some infections are mild because of a weak bug, or a resistent victim or a combination of both. The mission may be important and not very demanding on skill. But you must decide in the first instance when to stay away from the aeroplane. Your supervisor or MO, because of his special knowledge and unbiased position, can aid or finalize the decision but he cannot detect the problem as soon as you can. In general is it not better for a healthy man to work harder or longer, or for non-essential work to be delayed, than for a disabled man to blunder bravely but perhaps dangerously along? At least by removing yourself from the work scene you can reduce the spread of infection and help to avoid a crippling epidemic. Keep fit, don't play with drugs, and take the blocked ears along to the doc as soon after flight as you can. When the head hunters get to you don't be too proud to make a tactical retreat for repairs.

Oxygen Contents Gauge

The cause of several incidents, recently reported on D14s, indicate that everyone is not clear regarding the O_2 contents gauge. This gauge is nothing more than a pressure indicator and as such is subject to the normal effects of temperature.

In jet aircraft that are capable of climbing to altitude rapidly you will notice a rapid drop in oxygen pressure during the climb. Although part of this decrease in pressure is due to the oxygen consumed by the crew, the greater part is due to the temperature change in going from ground level to cruising altitude. On a summer day with a surface temperature of 80°F and a temperature at height of -60°F, the pressure in an 1800 psi system will decrease to approximately 1300 psi while the pressure in a 450 psi system will decrease to approximately 330 psi. Since this decrease in pressure normally occurs during the first ten to fifteen minutes of flight a direct reading of the gauge would indicate that you have apparently gone through one third of your usable oxygen in this time. If you are unaware of the reason for this pressure drop rough calculations will indicate that you have twenty to thirty minutes of usable oxygen left and you may decide to call off the flight.

As you start to let down, the oxygen cylinders become warmer and you will notice that the gauge will stabilize and give the impression of a zero or extremely low oxygen consumption rate. It is possible, depending upon the rate of descent, to experience an apparent negative oxygen consumption rate. This can be disconcerting to the inexperienced pilot.

Just how dangerous is a little knowledge of your oxygen system? According to statistics it is often fatal. So the moral is, if you use it, understand it.

GOOD WRITE-UPS

the first step to good maintenance

(Some words and phrases have been replaced by equivalent RCAF expressions.—ED).

The pilot greased the bird in for a smooth landing at a transient base and taxied to the parking area. After shutdown, he quickly entered an unserviceability in the L14—"VHF radio weak and unreadable". A few hours later he returned to the line for the return flight back to base. He checked the L14 to see if the unserviceability had been corrected and then grunted in disgust as he read - "Ground checked O.K.".

There probably is not a more aggravating corrective action in the world to the pilot than "Ground checked O.K.", yet from the maintenance standpoint, this indication of corrective action may seem completely reasonable. For example, consider the write-up made above - is it completely adequate? What distance from the station and what altitudes were involved? What frequencies were involved, etc.?

Maintenance personnel, too, have gripes about the inadequacy of write-ups made by aircrew. We can illustrate this by recalling the action of one exasperated maintenance officer. He posted the following on a large blackboard where all pilots and maintenance personnel could see it:

Write-up: Lost number three engine.

Corrective action: Number three engine found.

Those of us who fly the aircraft have discovered that to help maintenance personnel, we must provide them with as complete a descriptive report of the malfunction as possible. This is undoubtedly of more value to them than any other one thing we can do. Only too often though we find that what may appear as minor discrepancies to flight personnel and then forgotten may have indicated important trend significance to maintenance personnel because of past records they have available for comparison.

One of the most temper-testing write-ups of both operators and maintenance personnel is the recurring discrepancy. Pilots often voice unpleasant opinions of maintenance when they continue to have difficulty with the same unit they, or some other pilot had written up that day, or days previous. The mechanic who has changed the same unit several times, double-checked all connections, re-studied the EO and still finds the same write-up, likewise is prone to become exasperated.

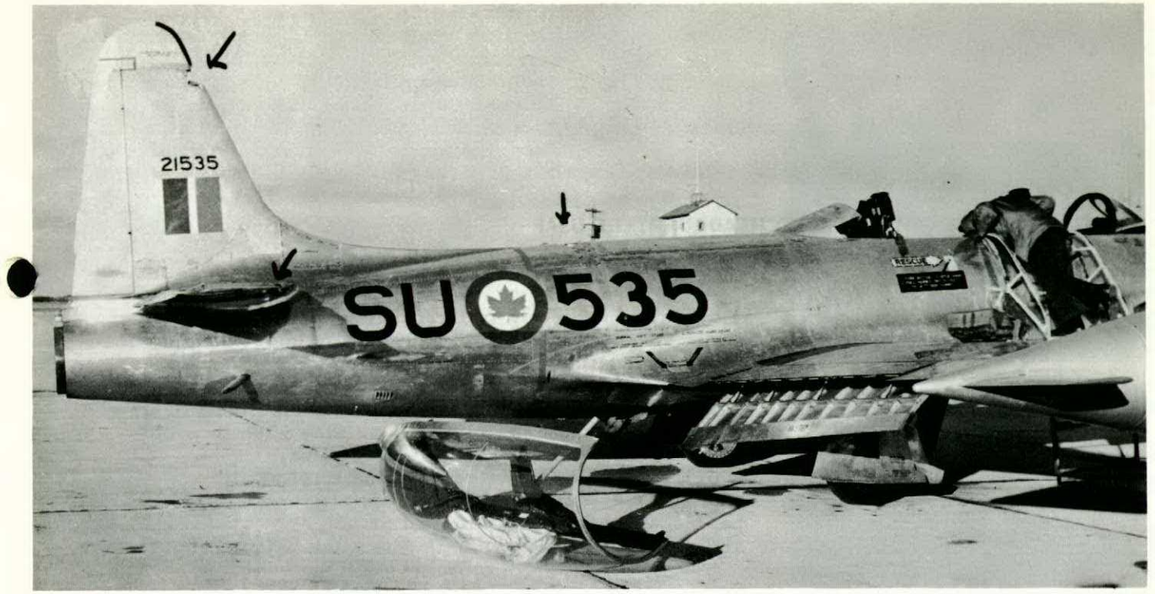
However, working at cross purposes is an awkward way to get a job done. The best way is to work together and both operations and maintenance are in agreement that the earlier the trouble is corrected, the better.

At one unit, recurring discrepancies are being thermofaxed and carried in the back of L14s. Before each flight, the aircrew members check these thermofaxed records. This alerts them to any recurring discrepancies and they are particularly attentive to these areas. They not only know that they have a problem, but they also know that the mechanics have a problem. If one or more malfunctions show up repeatedly aircrew are more likely to write-up the most detailed information they can.

Another approach to the problem is to have the most experienced pilots assigned to test flight duties. Test flight work sheets can be supplemented to provide a check commensurate with quality of maintenance desired. Before each test flight, the records can be screened for recurring write-ups. The pilot can then make a positive functional check of any items or system which falls into the recurring category. In effect, if a malfunction is going to recur again, the pilot can make every attempt to get it to recur during the test flight.

Whether you fly them or maintain them, always do your part to KEEP EM FLYING. Remember that when a discrepancy is fixed AND STAYS FIXED, everyone is happier, AND SAFER!

USAF: Flying Safety



I DIDN'T KNOW IT WAS LOADED

by S/L A. H. Petrin

There are a couple of triggers on the T-33 that, when pulled, can produce results every bit as deadly as a loaded gun. These triggers are operated by the emergency canopy jettison levers at floor level on the right side of each cockpit. The Stage 6 seat modification introduced this lever, and since its installation five instances of inadvertent canopy jettisoning have occurred.

What is the purpose of the lever and how does it work? If the canopy does not jettison normally when the right arm rest is raised, rotating the lever activates an emergency initiator mounted on the cockpit floor. The lever is attached to the seat at the lower right side and rotates forward during operation. When a 14 lb force is applied to the "T" handle of this lever it produces a 25 lb force at the initiator sear. Then, "by a suitable system of levers, etc." the canopy departs the aircraft. Moving the "T" handle approximately 1 inch will fire the canopy.

Inadvertent jettisoning of the canopy on the ground is a potential killer of personnel, both aircrew and groundcrew, in or around the aircraft. Four canopies have been inadvertently jettisoned on the ground during start-up or after shut-down; one canopy has been jettisoned in the air. Fortunately, no one was hurt. Some were badly shook up, however. In each case damage was costly. Did you know that replacement of a complete canopy costs approximately $4,000.00? If the canopy lands on the aircraft, the canopy may not be badly damaged, but you should see the aircraft. And what price do we quote if the canopy lands on an airman?

What are the causes of these inadvertent jettisonings? The one case that occurred in the air took place at 35,000 feet. A lad in the rear seat, who had not been properly briefed on the Stage 6, mucked about with the knobs and handles. The two pilots in the aircraft had a very cold, dangerous and unforgettable ride down to safety. The same cause—inadequate knowledge—resulted in two jettisonings on the ground. In the other two cases it is suspected that the dinghy lanyard, the emergency oxygen hose or the lap belt became entangled with the lever. Then, when the pilot moved, the lever was rotated and the canopy was jettisoned.

How can we prevent further instances of inadvertent jettison? The best way is to be so familiar with the system and its operation that you won't make a mistake. You, as captain, must also ensure that other people in your aircraft know the system. A safety wire on the lever would probably reduce the possibility of these occurrences; but a safety wire would also counteract the ease of operation required in an emergency. T-33 operating instructions have been revised. A "Caution" about this system has been included. Get the book out. Read it. Go over the whole system again. Remember, a little knowledge is a dangerous thing.

ETHICS

TACTICAL AIR COMMAND HEADQUARTERS USAF

Discipline comes in two packages: plain and fancy.
Plain is the military kind and the kind most people submit to
most of the time. It means working under the close
direct supervision of the boss,
who is always handy and ready to criticize the work,
and people behave mainly because they wish to avoid
that criticism. Fancy is self-discipline,
which is both the privilege and the trial of all
who are self-employed, of all executives and professional
people whether self-employed or not,
and some non-professionals who work without supervision.

Self-disciplining people must maintain their own output
and regulate their methods and behavior on their own.
They are responsible to someone
but are only indirectly supervised because
of the complicated nature of their work.
Actually, self-discipline is self-criticism and
if it is going to work at all,
one must have certain standards
to which one can hold oneself accountable.
Without such there is not self-discipline,
and the freedom and latitude offered
works to the individual's deterioration, both as a person
and in the public eye.
These standards of self-discipline are usually called ethics,
rules which all people of high morals impose on themselves,
to guide their conduct through their life.
The respect earned by any occupation depends on its ethics
and how well they are observed.

A satisfactory code of ethics must contain several elements
if it is to provide a well-rounded standard
satisfactory to the occupation and its people.
It must express the pride of the group,
for if there is no pride in the work, no other standard
can hold. The aims of the occupation,
what it is trying to do,
need inclusion for both pride and direction.
There has to be a better reason for work
than just to make money.
Integrity is very important and requires expression
in spite of our good religious up-bringing,
for the opportunity to cheat is ever present
and often attractive to the self-disciplined man.
And, of course,
the ethics must include the manner of doing business.

No work can ever be satisfying
unless there is pride in that work.
It is a fine thing to be part of the growing fraternity
of airmen, a situation which a man can occupy

with real pride and lots of it.
Airmen are a unique and distinct group of humans,
select in their intelligence,
emotional control, and judgement. We should never forget
that we are the men who make the dreams of the engineers
come true.

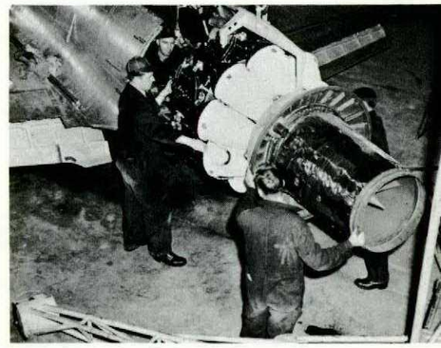
The individual integrity of the members of a profession
is vital to the quality of that profession
and the respect it earns.
We have all seen how a "sharp practice" lawyer
or a "quack" doctor can bring discredit to his profession
and have observed how quickly the other members
have disassociated themselves from the guilty person.
The principle of honesty in work applies equally
to aircrew and groundcrew
for there is a wealth of opportunity for evil practice,
ranging from the criminally liable to simple cheating.
It is impossible for any individual
to do dishonest work and not become personally degraded.
It is impossible for any group to accept or ignore
such work without also becoming degraded.

All codes of ethics include loyalty in their standards.
It is one of man's greatest virtues,
placing the well-being of the group ahead of the interests
of the individual.

But remember, true loyalty is not blind,
and no person or group has the right to claim it in support
of a wrong action.

All self-diciplining people must make a constant effort
to keep their standard of performance high in all respects.
Self-criticism demands
a permanent dissatisfaction with a technique,
a continuing interest in appearance and in bearing,
a desire for good relations with other people,
a healthy attitude toward the job, and manliness in trouble.
The very definition of self-discipline
requires this inclusion among the ethics.

Many people seem anxious to attain high position,
but when there,
try to duck out of the responsibility it carries.
In fear of retribution they avoid taking the initiative
and make constant attempts to ease the decision
on to someone else.
We the aircrew and ground technicians
carry heavy responsibility, most of which is non-transferable.
It is essential that we accept all the liabilities
of our responsibility.



NEAR MISS

FOR WANT OF ATTENTION

A pilot on proficiency flying duties was issued a flex back parachute on daily loan that had the D ring sewn on the right shoulder strap. The pilot noticed the change in D ring location, but because of recent modifications to parachutes and several user trial parachutes in use at this unit, he assumed that having the D ring on the right shoulder strap was a new modification. Two sorties were flown using this parachute. It was then issued to another pilot who brought the faulty location of the D ring forcibly to the attention of the NCO i/c SE Section.

This parachute had just been returned from SE Maintenance. The repacking, the maintenance, the inspection, and the actual error in installation of the D ring on the parachute had been carried out by qualified tradesmen. Further, this parachute had been handled several times by the user section without the fault registering on any tradesmen.

Aircrew are prone to accept articles of safety equipment from the SE section in good faith as to their condition and serviceability. In the event of a bail-out in which the automatic release mechanism fails, one could easily imagine the look of consternation on the pilot's face as he bears the bones of his right fingers while clawing for the D ring that isn't there! The gravity of this situation only serves to re-emphasize the need for aircrew to inspect personal safety equipment, and the folly of accepting something at face value when its purpose is not completely understood.

. . . while clawing at the D ring that wasn't there.

CAST OFF FOR'ARD, CAST OFF AFT, ENGINES FULL AHEAD

It just wasn't my day. In early February I was assigned to fly an Expeditor carrying four passengers from a base in Central Ontario to an RCAF base in the Maritimes.

On the morning of the trip, I arrived at met briefing and learned that a warm front with multiple layers of cloud was lying just west of our base and extended approximately 100 miles to the east. The forecaster advised that I would encounter some icing but would run out of it shortly after takeoff. Base weather at briefing time was 900 feet. Weather at destination was CAVU.

I flight planned at 7000 feet to get between layers of cloud and proceeded to sign out on the F17. As the trip would have to be made under IFR I asked the flight commander for a co-pilot. He had previously attempted to arrange for one but had met with little success.

At the last minute, a co-pilot (a senior officer) was found and I met him a few minutes later. At the same time, I learned that we would only be taking three passengers. I contacted the passengers, and as I knew them, I didn't spend any time with introductions. I told them we were heading for the aircraft. As the co-pilot and I walked down the hangar line, I discussed the trip with him.

I then proceeded to the servicing section and signed out in the L-14 and obtained the travelling copy. When I asked where the aircraft was parked, I was told that it was still in the hangar. As wet snow was falling, I suggested that the hangar doors be opened to cool off the aircraft before it was pulled outside. However, by the time the aircraft was pulled outside it had not cooled sufficiently and it iced up rapidly.

As we had entered the aircraft while it was still in the hangar, we remained in the aircraft during the de-icing process. This action took approximately 15 minutes.

I taxied the aircraft to the run-up position; the ATC clearance was passed to us and the co-pilot repeated the clearance but did not attempt to write it down on the flight plan board.

I moved to the takeoff position but had to hold for several minutes before receiving takeoff clearance. During this time I kept the engines running at about 1200 rpm and exercised the carb heat once.

On receiving takeoff clearance, I pulled out onto the runway, did my last check (tailwheel, pitot heat, gills) and opened up the throttles. I got up to 30" when the co-pilot topped my hand and indicated that he would continue with the throttles; he opened up to maximum takeoff power.

The aircraft took off in approximately 4000 feet. I was kept busy wiping the steam off the window in order to see the runway. I retracted the wheels and allowed the speed to build up to 105 knots for the climb.

As I had been instructed to contact Radar Departure Control after takeoff, I expected the co-pilot to switch from tower frequency as soon as the tower advised our time off. The co-pilot apparently did not hear the tower and I had to answer the tower transmission and then advise the co-pilot to switch frequency.

At this point it became apparent the co-pilot was not familiar with piston aircraft departure procedures and I was forced to tell the co-pilot what was necessary as we went along even though he had acknowledged ATC clearance. Instead of working the radios only, he kept trying to synchronize the engines.

In my attempt to discuss procedures, the starboard engine iced up and lost all power. As the aircraft swung off course, I started to take corrective action. I looked down and he was pulling on the wing de-icers. I shouted to him to leave it alone and commenced a turn toward base. I also called Radar Departure, advised them that I was on single engine and requested immediate clearance to the airport. I asked the co-pilot to tune in a beacon that I would use but even this ended in confusion.

At this point, one of the passengers who was an experienced Expeditor pilot and current on local procedures asked if he could help. I asked the co-pilot to change seats with the passenger.

Once the change-over had occurred, everything settled down. The GMS check showed that there was insufficient carb heat on and shortly thereafter full power was restored on the starboard engine.

As the situation was intolerable under the existing circumstances, I continued to the airport for a normal landing. Shortly after touchdown, met reported that heavy icing was reported by several aircraft in the area in which I had been.

The following conclusions can be drawn from the foregoing: (a) I did not give the co-pilot a complete briefing on the weather. (b) I did not check his qualifications. (c) I did not assign him specific duties. (d) When he took over duties which I intended to do, I failed to over-ride him immediately. (e) Because of (a)(b)(c)(d) I failed to maintain sufficient carb heat and allowed the starboard engine to ice up. (f) I failed to investigate power failure as soon as it occurred.

It just wasn't my day. A serious accident could have occurred if corrective action had been delayed any longer. What makes a pilot with almost 500 hours on type over the last eight years do a thing like this? I believe it is because I am so familiar with procedures that I got careless. Familiarity breeds contempt. It also breeds accidents.

Now that I have had time to look over the record, there is one thing that I would be very interested in ascertaining. As I am an abstainer, is it possible that I breathed sufficient fumes from the de-icing process on the aircraft to become intoxicated?

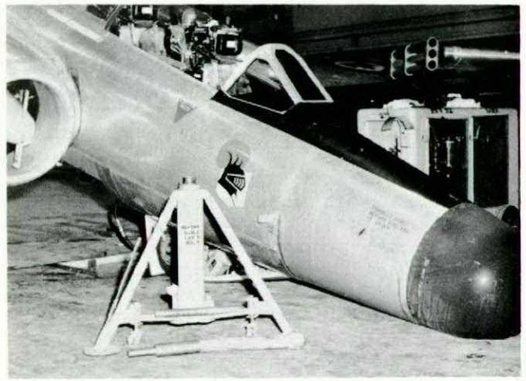
(This is a voluntary report and we admire the self-criticism that has been offered by this pilot in the hope that it will prevent others from making the same mistakes. We would add to his conclusions that on this day he was not an aircraft captain; he was merely a throttle pusher—and not a very good throttle pusher at that. Out-of-practice rank in the right hand seat and bad weather is a dangerous combination. But being outranked is no excuse for not being a captain. Senior officers like to bounce their grandchildren on their knees too, and if the worst comes to the worst, your CO and your command organization have the rank and the responsibility to back you up—ED)

LOOK before you lower

by WO1 F. Rothery

Moving the selector is not part of a BFI.

Another T-33 whose nose wheel retracted on start-up.



The crew did not notice that the jack had been moved.

"Disciplinary action has been taken...and those in charge...ordered to ensure...all supervisory personnel exercise more personal control over proceedings...."

This is a quote from a ground accident report concerning an inadvertent undercarriage retraction that cost the air force $6000.00 and 60 man-hours of work to rectify. An LAC was detailed to jack a CF100 for a retraction test. Wing jacks were used to lift the mainwheels clear of the floor, but contrary to EOs the nose wheel was not jacked. When an up selection was made the nose wheel retracted—proving the adage "There is never enough time to do it right; but always enough time to do it over".

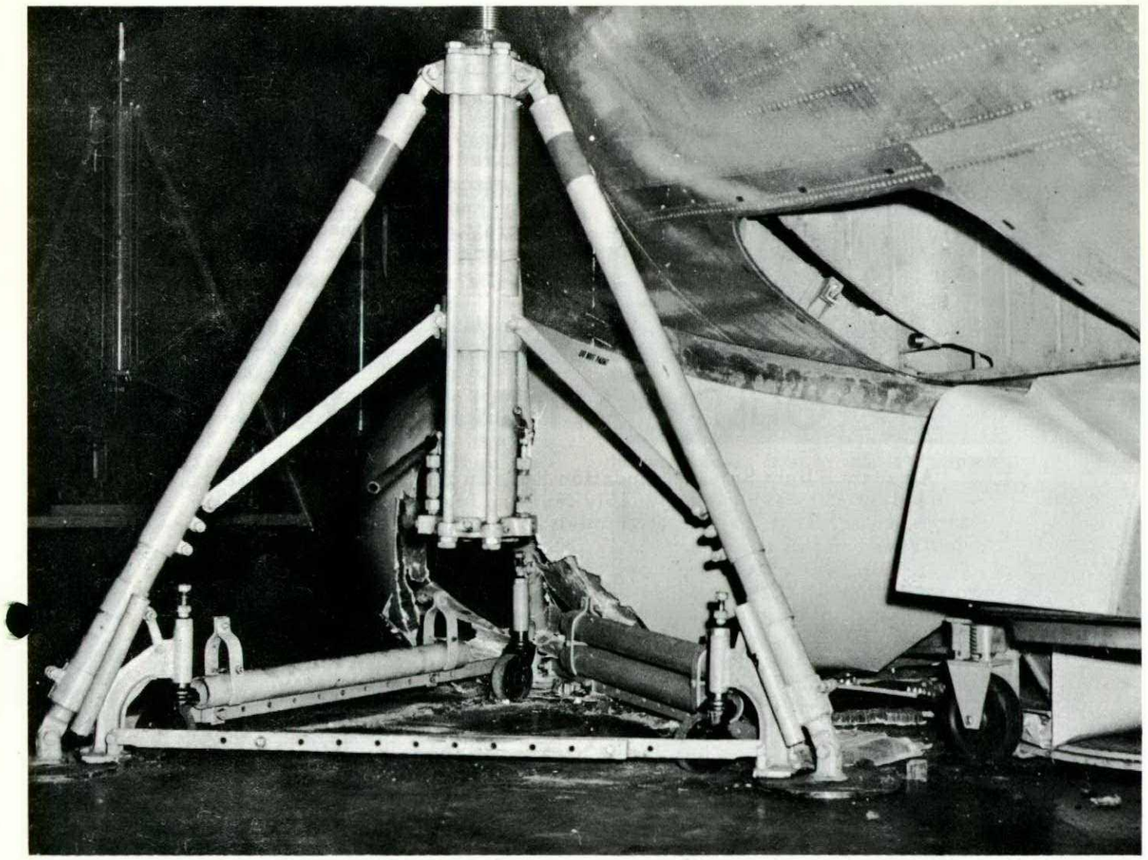
In the past three years there have been 17 similar ground accidents. (During this period there were also five inadvertent nose wheel retractions which were assessed "Aircrew".) The costs of these accidents have ranged from $2.00 and a few man-hours to over $11,000.00 and several hundred man-hours. These accidents can only be attributed to carelessness, shortcuts, and lack of supervision; and because they follow a pattern, they should not be hard to stop.

Fifteen of the seventeen accidents were due to one of the following: An aircraft was given a retraction test and then parked on the flight line with the undercarriage selector in the up position. When the engine was started the nose wheel retracted. Any one of three people—the technician, the supervisor, or the man in the cockpit when the engine was started—could have prevented this accident. An aircraft, after a retraction test, was taken off the jacks before the undercarriage locking devices were installed. When the hydraulic system was pressurized the undercarriage collapsed. The men who lowered the aircraft did not follow the EO procedure. The men who pressurized the system could have stopped this accident by doing a cockpit check to ensure that the selector was in the down position. In the third case the crew left an aircraft on jacks while they went for lunch. While they were away someone lowered the nose jack in order to take a jacking pad. (In two cases the jacks were not touched but the tail trestle was taken. True, this has no bearing on nose wheel retractions, but these cases are mentioned because they are cases of unauthorized removal of a safety device.) The crew returned and without checking they pressurized the system. The nose wheel folded. Hard as it is to believe, the technicians did not notice that the nose jacking pad had been removed and the jack lowered. The "thief" in such cases should be severely punished, one—for tampering with another crew's work, and two—for not leaving some obvious indication that the work had been tampered with.

Two cases do not fit the pattern. In one case an LAC was doing a BFI on a T-33 and made an up selection. There was pressure in the system and the ground locks were not installed. The nose wheel folded. The unit accepted his explanation (he said he thought raising the selector was part of a normal BFI), and by so doing implied that its technicians were not sufficiently familiar with EOs. Technicians should not be permitted to fiddle with the undercarriage selector while an aircraft is parked; and if it is ever necessary to move it, they must be absolutely sure that the undercarriage has ground locks installed and that there is no pressure in the system. In the other case a MRP crew was modifying an Argus. One of the crew disconnected the nose wheel hydraulic lines and struts. The aircraft had not been jacked! The picture tells the story.

This then is the pattern that is emerging: on the part of the technician, shortcuts, carelessness and either ignorance or disobedience of EOs; and on the part of the supervisors, lack of supervision. These accidents are an indication of where the supervisor's attention is needed. At the organization level provision must be made to encourage supervisors to spend more time "on the floor" so the technicians may have the benefit of the supervisor's experience and example. In any event, the practice of moving the selector to the up position while the aircraft is on the ground is dynamite. It should only be done during a retraction test and then only under direct supervision. And any technician who leaves the undercarriage selector in the up position after the retraction test is completed is not worthy of the name.

You have to save an awful lot of minutes to pay for a ten thousand dollar accident.



The nose gear was disconnected before the Argus was jacked.

SIGNED SEALED and DELIVERED

One of the important factors that has made military aviation great over the years is the excellent material condition of its aircraft. This has been made possible by the many serious and dedicated people, civilian and military, who work for the aviation industry. The confidence that pilots place in their aircraft in part reflects the ability of these people to design, manufacture, overhaul, and maintain aircraft so that they remain in "top-notch" material condition over extended periods.

Occasionally, however, a person comes along who, even though he may be technically qualified, has either forgotten or refuses to assume the responsibility vested in and required of him to insure that the work for which he is responsible is done properly. As a result his jobs are done in a lackadaisical manner and without the professional attention required. Three typical cases that illustrate the results of this approach are given here to point up the hazards involved. An aircraft just received from the factory was severely damaged by a fire which resulted from a hydraulic leak caused by an inadequately torqued hydraulic fitting. In another case an aircraft just out of overhaul crashed on take-off because the control cables had been reversed during installation. And finally, a report recently received cited a very lengthy list of discrepancies, many of a Safety of Flight nature, which were discovered on aircraft received for interim rework. In each of the above cases these aircraft supposedly received an inspection prior to being released, and as an indication that an inspection had been performed various persons signed an inspection sheet, signifying that the aircraft was mechanically acceptable.

A man's signature affixed to any document is a statement that the man is ready to stand behind the things to which he has attested. The person who does not live up to the responsibilities vested in him and further perpetrates this by falsely signifying that he has honestly done his job is a person who cannot be retained in any organization, especially one involved in the field of aviation. Too many lives and dollars are at stake.

Therefore, it behooves each of us, whether in industry, or in the RCAF, to first uphold our own personal integrity, and secondly not to tolerate those who do not consistently uphold their own. Persons assigned supervisory responsibilities must be alert to detect those who fail to meet the high standards required in every aviation function, and to take any required action to prevent loss of personnel and aircraft. We must consistently and positively know that when the goods, in this case aircraft, are signed, sealed, and delivered, they are ready to go in all respects.

US Naval Aviation Safety Center

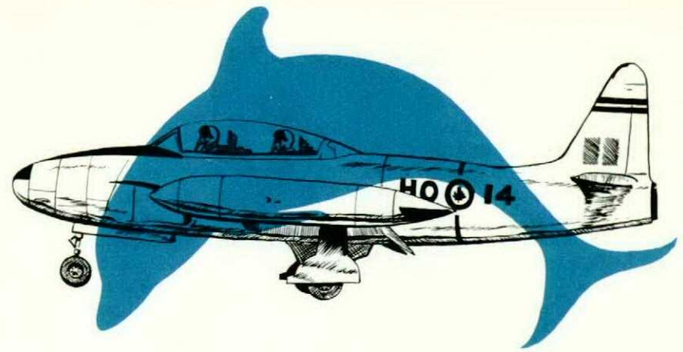
IT COULD HAPPEN TO YOU

A recent Flight Safety Foundation bulletin describes two accidents caused by reversed power supply leads to fuel booster pumps. One airman was killed, two were seriously injured, and two aircraft were destroyed in the explosions.

In both cases the motor circuits were being tested prior to final installation of the pumps in the fuel tanks. The airman who was killed was holding the pump in the tank opening while the others had loosely bolted their pump to the mounting flange. In both cases the loose connections caused an intense arc which ignited the explosive fuel-air mixture when the current was turned on.

If the pumps had been solidly bolted in place before the motor circuits were tested, the arcing, and therefore the explosions would not have taken place. The circuit breaker in the motor circuit would have tripped under the short circuit conditions and there would have been no damage.

This type of accident could happen in the RCAF under our present procedures. AMC are preparing an EO in the 00-80-4 series which will eliminate this accident potential. The EO will advise all concerned of the importance of proper installation and testing procedures when installing components in or around aircraft fuel tanks or in any other areas where explosive fumes are present.



PORPOISING

by S/L G. L. Sheahan

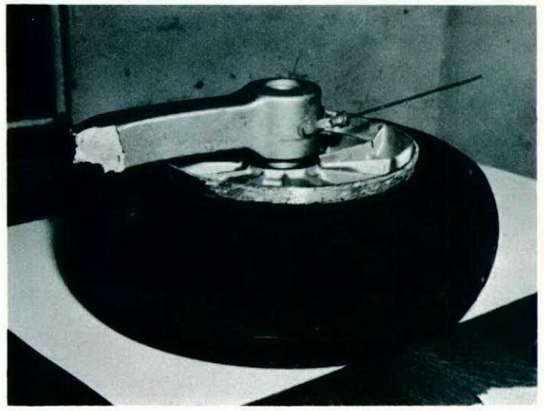
Have you ever seen a porpoise, porpoise? It is indeed a sight to see. They leave the water so gracefully, dive back in to appear again almost immediately, each time rising a little higher than the last. Yes, it is a wonderful sight to see.

Have you ever seen a T-Bird porpoise? Well it tries to copy the mammal for which the manoeuvre was named. Trouble develops when the nose of the bird tries to complete the porpoise by going underground. Normally, on the third or fourth porpoise the nose wheel assembly breaks off or the airframe is damaged.

This porpoising business in a T-33 is a known landing hazard. It is a condition in which the aircraft bounces back and forth between the nose wheel and the main gear during the initial phase of ground contact. It happens when the aircraft is landed at too high an airspeed and the nose wheel touches down before the main gear. The result is a violent, unstable oscillation about the lateral axis of the aircraft, causing repeated heavy impacts of the aircraft on the runway.

There is another way that a porpoise can develop and did—during a landing run. The aircraft approach speed was maintained at 140 knots. The aircraft was flared and touched down 200 feet from the end of the runway at 115 knots with the power off. The runway had an upward slope for the first 500 feet and when the aircraft rolled over the hump it became airborne. The nose of the aircraft was in a moderate nose high attitude and the pilot stated that the aircraft bounced on touchdown. He did not elaborate further except to say that he recognized a porpoise, so he centralized the

This broken casting shows the violence of porpoising.



controls and warned the co-pilot. The aircraft came down for the last time on the main wheels; the nose wheel whipped down and the nose wheel fork fractured on impact.

It can be seen that the circumstances leading up to this porpoise differs from the information contained in EO 05-50C-1, para 82. In this case it's easy to figure out how the porpoise developed. The pilot stated that on becoming airborne in crossing the hump the aircraft was in a nose high attitude, and either consciously or unconsciously he must have tried to lower the nose slightly before touching down. When the main gear did touch down the nose was dropping and this slammed the nose gear onto the runway. The resulting porpoise caused the nose wheel fork to break off.

The EO is very specific. The corrective action is to position the control column in neutral or slightly back of neutral and advance the throttle to 100%. The pilot in this case centralized the control column but didn't add power. Why he didn't add power only he knows.

Now you might be wondering why the porpoising problem is being brought up again after all the years we have been flying T-Birds. In the last year we have had four accidents caused by the aircraft porpoising due to pilots using poor landing technique. It is interesting to note that Training Command recognizes the problem and has taken positive corrective action; Training Command has not had an accident due to porpoising during this period. It is more interesting to note that all four accidents were caused by our operational squadron pilots.

It would appear that operational pilots are trying to land the T-33 a la Sabre or CF100. The results have been costly. When flying the T-33 use T-33 techniques. If you are in doubt refer to the dash 1. Supervisors take note. Are your squadron pilots up to scratch in the T-Bird?

It has been stated before, but it bears mentioning again. With every reduction in our accident rate it gets more difficult to maintain the rate of reduction; so any problem area that causes four accidents in a year bears looking into.

Undershoot Problem

Part of the undershoot problem is the time it takes to accelerate a jet engine from idle to high rpm, and the fact that most of the thrust increase takes place in the last few percent of rpm. One modern engine gets a 40% increase in thrust in the last 7% of engine rpm increase. Moral: Don't wait until it's too late to start a go-around.

Flight Safety Sentry

FUEL FOR THOUGHT

During pre-flight inspection of an aircraft, while the pilot was inspecting the port landing gear the serviceman climbed atop the port wing to open the access doors and gas caps to facilitate inspection. As he opened the main fuselage fuel cap, JP4 overflowed from the cell due to expansion during the heat of the day and poured on the pilot's back.

Instead of showering and changing flight suits, the pilot chose to continue the flight without delay. Subsequent events caused him to regret this decision.

During the flight, approximately a two-hour hop from chock to chock, the pilot perspired profusely. On completing the hop, he immediately took a shower, put on fresh clothes and reported to the dispensary. The chemical contact with the JP4 had resulted in 1st and 2nd degree burns of the entire lower back requiring five days hospitalization.

The reporting flight surgeon recommends that all persons coming in contact with JP4 should immediately remove the clothing over the affected area, wash thoroughly with soap and water, then report to the dispensary.

USN: Approach

A Bargain And For Free

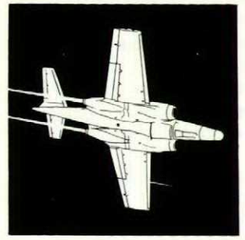
I'm an old familiar product. I was one of the standard brands long before brands or standards existed. But in spite of my time-tested pedigree, the retailers claim I have always been a tough one to sell.

What's wrong? Can't be lack of advertising or lack of selling points. I've always been a bargain. What's more, I'm for free. And what do I offer? A few minor advantages like happiness, health, well-being, security---and a major advantage like life itself. I don't claim to prevent dandruff or halitosis, but I've been known to prevent human pain, sorrow, tragedy, poverty, death. Not bad for a free product. But why doesn't everyone use me?

I won't deny that it's got me baffled, or that it's brutally discouraging at times. Don't think I'm calling it quits. No, the advertising campaign will go on. I'll keep hammering away at you for carelessness, indifference and ignorance. I'll sell myself to you if you will give me half a chance---or else my name isn't SAFETY!

US Naval Aviation Safety Center

ARRIVALS and DEPARTURES



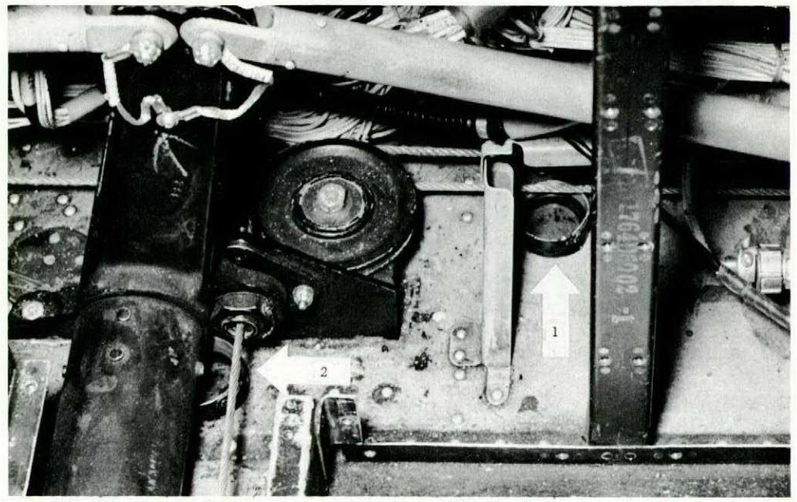
CONTROL MALFUNCTION

On completion of an air-test after a periodic inspection, the pilot of a CF100 touched down normally, and while easing the control column forward during the landing run, he found that the control column was restricted in its forward movement to approximately half way between neutral and the fully forward position.

After turning off the runway a check by the pilot failed to reveal the cause of the restriction. Subsequent investigation revealed the glass cover of the rear cockpit map light had become detached and lodged under the control lay shaft.

After the periodic inspection the aircraft had been test flown three times for various snags. During these flights no control malfunction occurred. Prior to the fourth and final air-test it was necessary to remove a time-expired item of telecom equipment. It is deduced that at this time the light cover was inadvertently knocked loose and entered the control area.

This Maintenance Error is attributed to: one—failure during the periodic inspection to replace all time-expired items which necessitated the opening up of a control area that had previously been signed out as free of



1. Light cover was found here. 2. Light cover caused control malfunction here.

foreign objects and restrictions; and two—the failure of the electrical technician, who carried out a BFI, to notice the missing light cover.

It was fortunate indeed that the restriction to the elevator control did not occur during takeoff or during the air test. The results of this would have been disastrous to say the least.

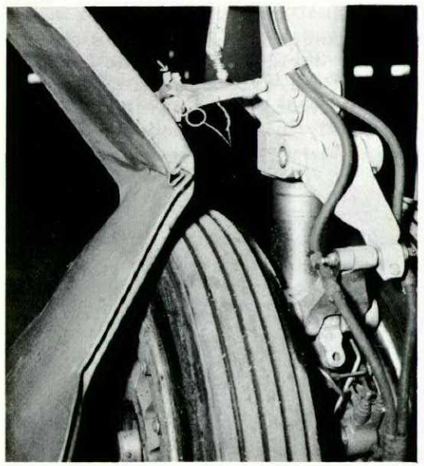
BAD CHEQUES

On takeoff for a routine air test the pilot of a CF100 had trouble retracting the nose wheel. After the test the undercarriage locked down. The pilot then decided to check the nose wheel retraction again. On the up selection both the nose wheel and the port main gear showed unsafe. On the down selection the indicators showed safe, so the aircraft was landed.

The port main fairing assembly, Part No. 1/K 31053, was damaged beyond repair, because it had not been connected properly. It is routine to disconnect this fairing to check tire pressure, and someone apparently thought he could not make a mistake in anything as routine as checking tire pressure so he did not double check his work.

(When a technician signs for a job it is the same as signing a cheque (no pun intended). His signature should represent something of value. The signature of the technician in this case wasn't worth the trouble of writing it. He issued a bad cheque.—ED)

Improper installation after tire check caused this failure.



HE SHOULD LIVE SO LONG

While cruising at 35,000 feet in a CF100, the Obs/AI complained of feeling dizzy. The pilot told the Obs/AI to use the "press to test" and hold his breath. This seemed to work and the Obs/AI felt better. The pilot carried on.

In approximately 5 minutes the pilot felt hot and cold and he stated that he took action for hypoxia and hyperventilation and felt better. He carried on with the exercise.

Shortly afterwards the pilot found that he was unable to read the instruments; at this time the navigator felt dizzy again. The pilot informed GCA and made an immediate descent. During the descent GCI suggested that the aircrew pull their emergency bottles. The pilot pulled the apple and felt better immediately. A normal landing was carried out.

This is not the first case where aircrew carried on after experiencing oxygen trouble. This is not only astounding, but it leaves the Flight Safety organization with a feeling of defeat. This is especially true of the Flight Safety Educational branch. When a thing like this happens we feel that either we are not informing everyone about these incidents or else you are not getting the message.

In this case the aircrew obviously did not get the message. The pilot had over 1000 hours in jets. He should live so long.

WEATHER WORRIES

In this case weather was also a factor. It was as follows:

Forecast
1800-2400Z - Ceiling 5000 partially obscure
Visibility: 6 miles
Weather: light snow

Weather
1810Z - Ceiling 1000 obscure
Visibility: 5/8 mile
Weather: light snow

1838Z - Ceiling 700 obscure
Visibility: 1/2 mile
Weather: moderate snow

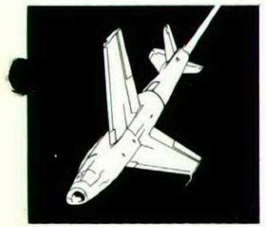
When the flight plan was filed the weather for the destination was forecast to be 5000 broken 6 miles in light snow.

The aircraft arrived over destination at 1809Z and was cleared for an ADF letdown with a GCA pick up during penetration turn. The weather was given as 1000 obscure 5/8 of a mile in light snow. VHF contact was made with GCA during the penetration turn at approximately 1814Z. GCA advised that there was small snow drifts on the runway. The GCA letdown was normal until about 3/4 to 1/2 mile from touchdown when the GCA operator called for increasingly large corrections to port. Visual contact was made with the ground at a 1/4 mile and the aircraft was situated some distance to the right of the runway. As a safe approach could not be completed an overshoot was initiated. On the overshoot the pilot maintained visual contact at approximately 400 feet and called for a GCA monitored short circuit. GCA vectored the aircraft back to final where the first visual contact was made with the runway lights at a 1/4 of a mile. The pilot completed the approach and on round-out he discovered that he was to the left of the runway lights and that he had lined up on a stretch of bare ground instead of the runway. He was able to correct and landed on the runway at approximately 120 knots and slightly off the runway heading. He attempted to hold the aircraft on the runway but towards the end of the landing run the aircraft ran off the runway breaking off a runway light and coming to rest on the grass area adjacent to the runway. The aircraft was not damaged. The pilot checked the drifts on the runway and estimated their depth to be six inches.

There were several factors that contributed to this near accident. There were no approach lights to this runway and the runway was not marked with evergreens. The bare ground on the port side of the runway was very distracting particularly with the runway snow-covered and drifted. In fact the pilot stated that the grass area to the port of the runway looked darker than the runway and looked more like a runway than the runway itself. The weather deteriorated rapidly during the approach.

While the pilot may be criticized for his handling of the letdown he could have been given more assistance from the ground. Firstly, the weather deteriorated during the letdown with the visibility reduced to a 1/2 mile and the snow intensity increased from light to moderate. The pilot was not informed of this fact. Secondly, the small drifts that were reported to the pilot by GCA turned out to be six inches deep. Thirdly, and most important, the runway was not marked with the standard evergreen marking.

The business of landing an aircraft in marginal weather conditions is a difficult one and everyone must be on their toes. If you, the pilot, are in doubt ask for information. If you, the ground staff, realize that the conditions are lowering advise the pilot. Remember everyone is in this accident prevention business and every accident saved is money in the bank.



DESCENDED BELOW LIMITS

The observed weather for the day went as follows:

1238Z - Sky: partially obscured
Visibility: 3/4 mile
Weather: fog

1243Z - Sky: partially obscured
Visibility: 1/2 mile
Weather: fog

1247Z - Sky: partially obscured
Visibility: 1/4 mile
Weather: fog

1252Z - Sky: partially obscured
Visibility: zero
Weather: fog

Three aircraft were airborne on local training exercises. The last one to take off asked for taxi instructions at 1232Z, and took off at 1235Z. Two of the aircraft were under GCA control and were practicing square pattern GCAs; the third was flying locally.

One of the aircraft on GCA asked for a low approach but because of the reduced visibility on final the pilot elected to land. This information was passed by GCA to the second aircraft as he was turning final at 7 miles, so the pilot also requested a full stop landing. When the aircraft was 3-1/2 miles on final the pilot was advised that the visibility was down to 1/2 mile. At 1/2 mile out, GCA informed the pilot that he was going through GCA limits, that he was on the glidepath, and that he was lined up to the left of "on course". At this point the aircraft veered to the left and was instructed to overshoot by GCA.

The pilot stated that he descended to GCA minimum and looked out to see if he could see the runway. A wisp of cloud went by the cockpit and then the lights in the undershoot area appeared.

At this point the pilot became slightly disoriented and before he could adjust himself from IFR to VFR flight the aircraft was in such an attitude that he was unable to prevent the aircraft from striking the runway extension short of the runway button. The undercarriage collapsed, the drop tanks were sheared off, and the aircraft slid for a further 1500 feet. The pilot received minor injuries and the aircraft was written off.

The third aircraft in the area was diverted to the alternate where it was landed safely.

This accident was caused by the pilot descending through GCA minimum. The fact that he became disoriented can be attributed to his breaking out of the fog, if you can call coming through fog breaking out, at too low an altitude. It does seem ironic that a pilot is allowed to carry out practice flying in deteriorating weather to the point that he is committed to land below limits.

The problem of changing from instrument to visual flight in marginal conditions is a

difficult one to solve. One of the ways to solve this problem is don't descend below limits.

NOW WE LOCK THE BARN

In one ground accident, three Sabre aircraft suffered category "C" damage. The accident occurred during a ground run-up after a No.1 inspection. An aircraft was positioned on the chained ground run-up platform. Two run-ups were completed without trouble. On the third run, at 100%, the starboard chock broke loose from the anchor plate; the aircraft swung to port and bent the port chock on its anchor plate which allowed the aircraft to surge forward in an arc to port. Before the airman could stop the aircraft, the port mainplane collided with the intake duct of a second aircraft and ran into the mainplane of a third aircraft.

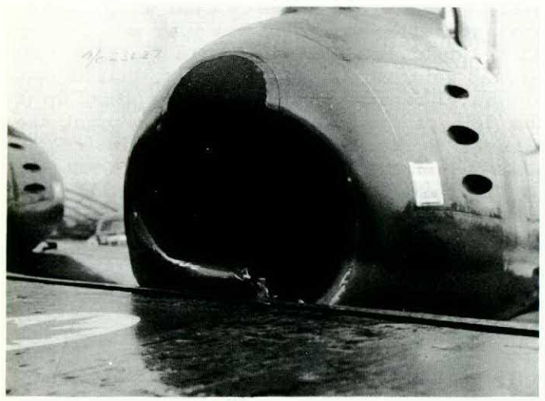
The investigation attributed the cause of the accident to the materiel failure of the starboard anchor plate. The anchor plate had broken across its width just behind the position where the chock was welded to the plate.

On the surface this is a straight forward case of materiel failure, but a little digging sure stirs up the mud.

A requirement for a permanent aircraft run-up installation was recognized when we first got the Sabre aircraft. Although the requirement existed, no action was taken to provide units with the proper equipment. This resulted in units designing their own locally devised run-up installations. These installations worked well but they were not considered ground handling equipment, or for that matter they were not really considered anything. Because of this, the installations were not subject to the same care and inspections that are given to standard RCAF ground support equipment. The result, a materiel failure of the run-up installation that could have been prevented by normal inspection, if such an inspection had been called for.

Preventative action was prompt. The plan for a newly designed chock was submitted to AMC for approval and introduction into the RCAF vocabulary as standard group handling equipment for the Sabre aircraft.

This sounds pretty good, but when you consider that the Sabre has been with us these many years, this problem area should have been recognized and rectified before this accident happened. It is easy to say that foresight is better than hindsight in the accident prevention business, but the fact remains that this is so. To prevent accidents everyone of us will have to use foresight and ferret out problem areas before the accident happens. You all know the story of locking the barn after the horse has run away. Well times have changed but the principle still applies.



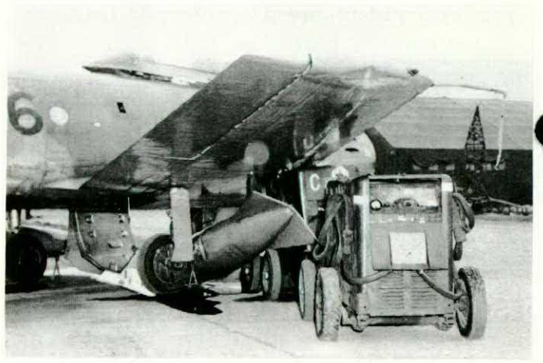
The end of a run-up to 100%.

ENERGIZERS ESCAPE

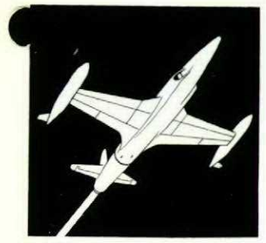
An LAC who had held an ME6 for three and a half accident free years was detailed to tow three energizers to the squadron's dispersal with a unimog. Just as he was turning into the dispersal, the last two energizers in the "train" broke loose and crashed into a Sabre. The wing tip, under surface of the wing and a drop tank were damaged. Total damage amounted to over $13,000.00.

No materiel failure, etc., could be found that would explain why the hitch had failed. This left two possibilities, either there was dirt in the hitch that prevented it from locking properly (considered unlikely) or the hitch was not locked to begin with.

About three years ago several similar cases occurred. And now just when we think we have the problem licked it pops up again. This brings us right back to where safety begins—to the individual and the need for constant vigilance.



The last two energizers broke free and crashed into a Sabre.



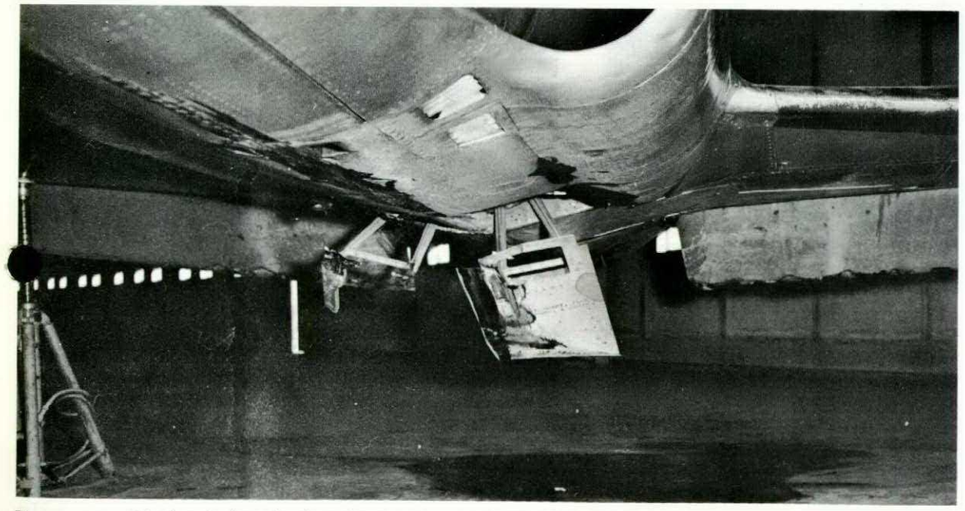
SAND IN THE DOWN-LOCK

A T-33 returned from a cross-country and arrived over the beacon with 196 gallons of fuel on board. The pilot did an overhead procedure, an ADF and a low approach GCA, and an overshoot followed by a normal GCA circuit. On the downwind leg, the starboard gear was slow to lock down but all wheels indicated down and locked on turn to the base leg. On the base leg, the pilot saw an aircraft on a long low approach so he overshot and returned to initial. On the downwind leg the starboard gear did not indicate down and locked. The pilot advised the tower, continued downwind and reselected. He returned to initial and tried the emergency gear extension, advised the tower of his low fuel state - 68 gallons, and asked for advice from the ground. A low pass was made by the tower, but due to the darkness, the tower could not see the gear.

The pilot then subjected the aircraft to G forces and yawed the aircraft from side to side. The horn continued to sound; the starboard gear still indicated unsafe. The port and nose gear indicated down and locked.

A decision was made to land wheels-up rather than land with one wheel unsafe. On final the speed brakes were selected out, the flaps down, the canopy was unlocked, and the harness tightened and locked. Prior to touchdown the engine was flamed out and the battery was switched off. The landing was a good one, and the aircraft sustained "C" category damage. The seat and canopy were safetied and the aircraft was abandoned. The crew were not injured.

The aircraft was hangared, put on jacks and given a gear extension test. On the first down selection all three wheels extended and locked; but the starboard main gear indicator in the cockpit showed unsafe, and the horn blew. A visual inspection of the wheel well showed that the plunger on the starboard landing gear down-lock indicator switch, Part No. 178288-6, had jammed preventing proper operation of the down-lock indicator. This switch was removed and an examination showed that one of the arms on the plunger which holds the rollers was bent slightly. This distortion did not interfere with the movement of the plunger, because the plunger had a considerable amount of side play. (Side play is common even in a new switch.) Sand from the runway had gotten between the plunger and the bushing in which it slides and caused the plunger to jam. Once free of sand the switch worked normally. As an accident prevention measure the unit carried out an inspection of all undercarriage switches to ensure cleanliness.



Damage caused in the wheels-up landing when sand interfered with the down lock indicator.

From this it can be seen that the starboard wheel was in fact down and locked even though the indicator in the cockpit showed unsafe. While it is not the intention to find fault with the pilot's decision to carry out a wheels-up landing, he did contravene EO 05-50C-1, Part 3, para 35(a) and (d), in that he unlocked the canopy while airborne instead of jettisoning it, and he left the speed brakes out instead of up. Unlocking of the canopy was dangerous because it could have come off in flight and damaged the empennage.

A review was carried out of similar accidents. There have been eight previous accidents in which the aircraft landed on two wheels when one of the main gear indicated unsafe and was, in fact, unsafe and one accident in which the gear was locked down. Six of these cases concerned the T-33. In 4 cases the starboard undercarriage was unsafe; in 1 case the port undercart was unsafe, and in the other case starboard wheel came off. The damage was categorized as 1 "E", 2 "D", and 3 "C". No one was injured. In the "E" category damage case an unsafe indication showed in the cockpit but the wheel was locked down. The other three cases concern a Vampire—port undercarriage, category "D", a Sabre—starboard undercarriage, category "D", and a CF100—port undercarriage, category "C".

It can be seen from these statistics that landing with one main gear not locked down is not any more hazardous than landing with all the wheels retracted. For comparison, in the same period there were 26 cases where jet aircraft were landed wheels-up. The result was 1 "A", 7 "B", 15 "C", 3 "D" category of damage. In these cases there were no serious injuries.

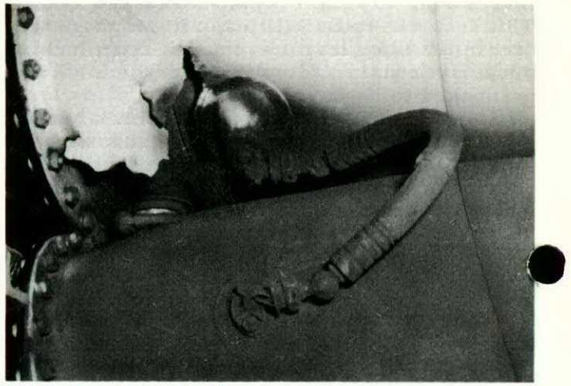
NENE AIR CASING

On takeoff in a T-33 the pilot noted that the engine rpm was 97.5% and that the JPT was 685°. During the climb to 30,000 feet the JPT increased progressively, so the throttle was retarded. To keep the JPT under 700° during the climb a power setting of 94-95% was necessary. On levelling a power setting of 89% gave a JPT of 575°

The flight was continued. After an IFR letdown and GCA the flight was continued to base VFR. During the flight back to base the pilot experimented by advancing the throttle to full throttle. This produced 98% power and a JPT of 730 to 750°.

The power was reduced to 80% and the aircraft landed at base. On landing the pilot reported abnormally high JPT.

An investigation revealed the following damage; a hole blown in No.3 combustion chamber, one stator blade broken off, and several more stator blades nicked at their trailing edge.



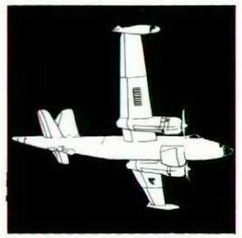
Number 3 combustion chamber.

Nene air casing failures are not new. They have been discussed many times in the past. The following is a quote from Flight Comment, January - February 1959 issue: "In-flight failures do not follow any pattern, however in each case there are symptoms noticeable to the pilot. It is extremely important to be familiar with these symptoms and to take immediate action. Any one or all of the following symptoms may be experienced.

- JPT higher than normal
- Increase or fluctuation of JPT without throttle movement
- Smoke or fumes in the cockpit
- Amber overheat or fire warning lights on.

If any of these symptoms are experienced, power should be reduced to minimum necessary to ensure immediate landing at the nearest suitable airfield." Unquote.

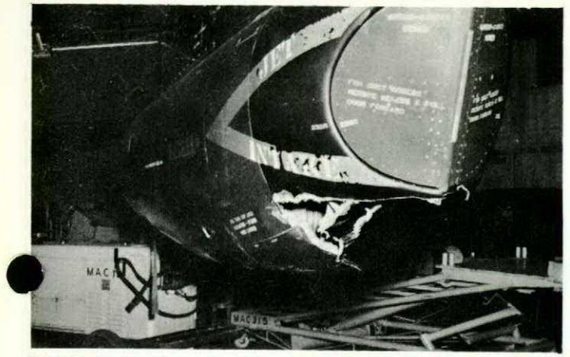
In this case two very experienced pilots ignored the symptoms and carried on with the flight. We are happy that they are with us today.



HANGAR GUARD

A Neptune and a Comstock starting energizer were damaged by a D12 tractor. The aircraft suffered damage to the nose, the barrel section of the port jet pod and the undercarriage door. The front wheel and axle of the energizer were damaged.

Now let's examine the details that led up to this accident. An airman who was on hangar guard duty decided to familiarize himself with the D12 tractor. He wanted to back up, but



The D12 jumped forward and struck the Neptune.

when he let out the clutch the tractor jumped forward and struck the aircraft. He tried to move the tractor back from the aircraft and this time he managed to get the D12 into reverse. He was so intent on not hitting the aircraft again that he backed into the energizer. We are fortunate another aircraft wasn't parked where the energizer was located.

It goes without saying that this airman was not an authorized driver. It also goes without saying that he had no business driving the tractor in the first place. So what is there to say that can put a stop to this sort of thing? This business of an untrained operator driving a tractor has caused a large number of the ground accidents throughout the RCAF. Perhaps our regulations are not strict enough. Then again perhaps we are not impressing on the man on the line the seriousness of the whole thing. This problem is a unit problem and must be handled at the unit level. The fact that these unnecessary accidents must stop is obvious, so let's get with it.

LIGHTNING STRIKE

Although the C119 was not damaged, the pilot's report of a lightning strike is indicative of what the uninitiated might expect.

"I was westbound at 18,000 feet. Several thunderstorms were circumnavigated enroute using radar. A night instrument descent was initiated and on passing through 15,000 lightning struck the nose of the aircraft. No CB activity close to the aircraft showed on the radar at the time. The resultant light from the lightning was sufficiently intense to render both pilots totally blind for a few seconds and minimum vision returned after about thirty seconds. The aircraft was allowed to fly on trim during this time and when vision returned the aircraft was still on course with the desired rate of descent. The strike was accompanied by a loud sustained bang and sizzling sound. The navigator noticed his radar set sparking just as the lightning hit and had the presence of mind to turn it off. The radar was left off as a ground inspection was considered desirable before it was operated again."

LETTERS TO THE EDITOR

Dear Sir

Clipped from page 3 of the Jan-Feb '60 issue of the Roundel (Vol 12, No 1):

THIS IS FLIGHT SAFETY?

IAS: 170K ALT: 7,000'

Or is Juliette actually a qualified pilot flying a North Star as a qualified horsewomen rides a horse - side saddle?

C. W. Steacy, F/L
RCAF Station Cold Lake

Transient Facilities

We, the staff of the POL School Saskatoon, agree almost completely with Cpl R.C. Hutton's recently published letter concerning the stand-

ards of accommodation and refuelling procedures.

The whole staff undertook a trip last summer which took us from Comox to Greenwood plus a visit to Air Div and we were amazed, delighted, dismayed, and horrified although not in that particular order, at the varying degrees of efficiency which ranged from excellent to poor.

One situation, which Cpl Hutton may not have met with, was the question of returning bedding when there was an early takeoff. Sometimes this situation necessitated arranging with a friend to turn in the bedding on your behalf and trusting that the G90 would be destroyed.

We think that a standardized critique has some merit but believe that routine critiques have a tendency to become trivial and dwell on minor deviations and as a result are ignored. It is felt that a special report should be submitted where there is a major departure from the normal such as encountered by the POL staff at one unit. We were put in a transient room where it was obvious that the floor had not been swept for several days. By a strange coincidence the refuelling procedures on this base were among the worst encountered on the whole trip.

V. L. Ollson, F/L
OC POL School

Tire Trouble

In the January-February issue, I have just read a most interesting article "Retreads Pro and Con" by S/L E.D. Harper. He has brought out very nicely considerable information that is not available in EOs.

However, S/L Harper states that a Type 7 tire "may be given up to a maximum of four retreads." Contrary to this statement, EO 110-5-3, page 1, para 3 states "Retreadable tires are not limited to any number of retreads provided they have none of the above defects...."

On the subject of aircraft tires and tubes, I have been using the above referenced EO when instructing our airframe students in trade advancement classes. Naturally, the information quoted in class must be correct. For this reason, I would like to know if the EO is in error, and if so what are the correct regulations and the reference.

Again, many thanks to S/L Harper for a very fine article.

T. O. Smythe, Cpl
RCAF Station Moose Jaw

(It is all a matter of timing. Cpl Smythe had the correct information. The EO, however, was in the process of amendment when the article was written and Flight Comment beat the amendment to the field.—ED)

FLIGHT COMMENT

ISSUED BY

DIRECTORATE OF FLIGHT SAFETY

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STAFF

Editor-in-Chief—Squadron Leader George Sheahan

Editor—Mr. Garth Harvey

Circulation—Flight Lieutenant Peter Bremner

Artists—Mr. Jean A. Dubord
Mr. Harry K. Hames

Editorial Assistant—Mrs. Nancy L. Chenier

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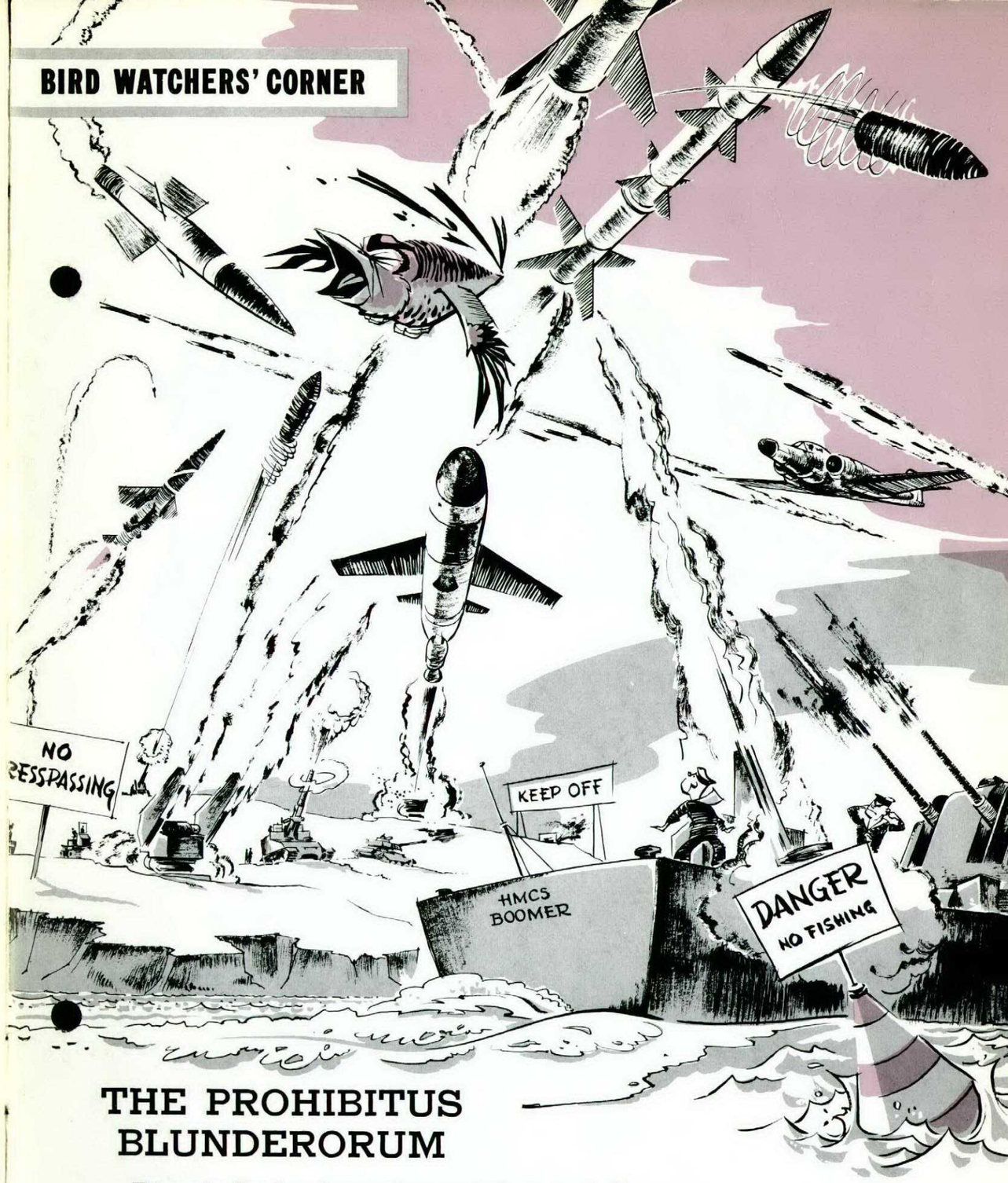
BIRD WATCHERS' CORNER



THE PROHIBITUS BLUNDERORUM

This species flies through areas where angels fear to tread. To get to the nesting grounds they blunder through the sanctuaries of other birds causing many a ruffled tail feather. They cause consternation in their own flock and in that of the Departmentus Offus Transportus. When fingered by the flock, their activities can be curbed by having them digest the Radious Facilitus Chartus.

O_2 AND YOU

EMERGENCY ACTION in HYPOXIA or SUSPECTED HYPOXIA

IMMEDIATELY upon detecting any symptoms suspected as due to oxygen lack, take the following action:

1. **PRESS THE TEST BUTTON ON THE REGULATOR, MOMENTARILY:**
   - (*a*) **IF NO PRESSURE IS FELT IN THE MASK pull the emergency oxygen bottle immediately**
   - (*b*) **IF PRESSURE IS FELT IN THE MASK select 100 % oxygen on the regulator select safety pressure (if applicable) tighten or hold mask to face**
2. **DESCEND IMMEDIATELY TO A SAFE CABIN ALTITUDE (10,000′ OR LESS)**
3. **BREATHE NORMALLY AT ALL TIMES**
4. **ADVISE SOMEONE OF YOUR DIFFICULTY**
5. **AVOID: PULLING "G", EXTREME HEAD MOVEMENTS, HIGH CABIN TEMPERATURE, BREATH HOLDING OR STRAINING MANOEUVRES**

The Queen's Printer and Controller of Stationery, Ottawa, 1960