FLIGHT COMMENT

ROYAL CANADIAN AIR FORCE

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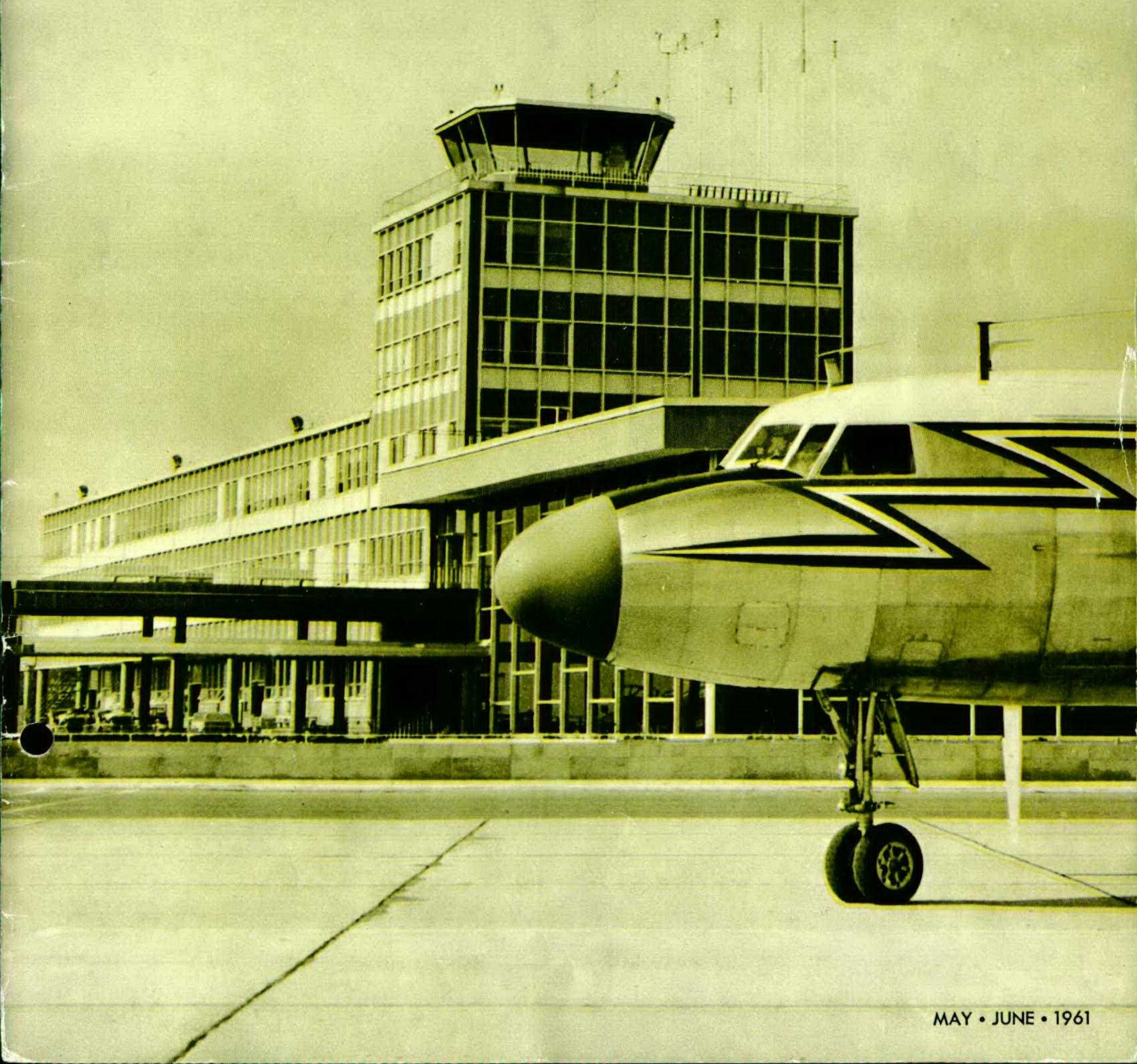


MAY • JUNE • 1961

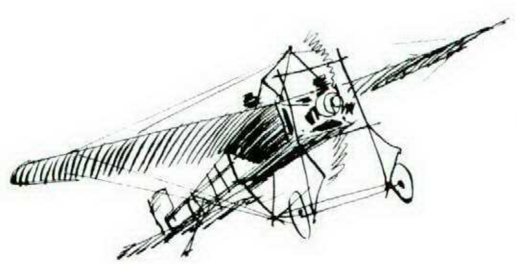
OH FOR THE GOOD OLDE DAYS

There once was an ancient aircraft
All wood and wire and string
That rolled and bounced into the sky
To vie with eagle wing.

No silver shooting star was he
No flashing, roaring sprite
Just a box with wooden wings
And flown by a guy called White.

Flight Safety - we did not hear about.
Aircraft - there were a few no doubt.
Pilots - glorious, glamourous, untouchable.
Accidents - all were acceptable.

S/L R.M. Beatty



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F/O A.I. UMBACH
F/L W.D. KOSTIUK
LAC QUINLAN
LAC THEISS

On a routine transport trip in a Caribou aircraft from El Arish, and upon arriving over Gaza, F/O Umbach could not get the nosewheel to lock down.

After several reselections and a visual check by another aircraft the nosewheel would still not lock down and in fact appeared to stick in about the half-way position.

As fuel was no problem it was decided to return to El Arish. Several attempts to lower the nose gear enroute were unsuccessful and the aircraft arrived over El Arish in the same condition, i.e., an unsafe nose gear.

While circling base, two-way communication was established with the ground and aircraft. The crew consisting of F/O Umbach, captain, F/L Kostiuk, 1st officer and LACs Quinlan and Theiss, crewmen, proceeded to run through all the emergency procedures and checks with assistance from the ground, and reference made to appropriate EOs, all to no avail.

A suggestion from the ground that efforts be made to make a hole in the aircraft and insert the nose gear ground down locks was put into practice by the aircrew. After removing and redistributing radio and other equipment, LAC Quinlan in view of his slim build managed to gain entry to the nose section tunnel, and after some struggle and with the help of a punch and hacksaw was able to cut a small hole in the airframe, enabling him to reach the nose gear and try to insert the gear lock. Unfortunately due to the partial retraction of the gear the down lock proved to be approximately two inches too long.

While the captain circled base the two crewmen with the aid of a small file cut 2-1/2 inches off the downlock and eventually managed to insert it in the gear.

The captain now made an approach and landing, cutting the engines on touchdown and holding the nosewheel off as long as possible and allowing the aircraft to roll to a stop without the use of brake. Some five hours had elapsed from the time of the emergency to the landing. Nose jacks were inserted immediately and after inspection the aircraft was towed to the hangar. While towing the nose gear extended and locked fully down.

The fault later proved to be a design error and modifications now in progress will eliminate a recurrence.

Flight Comment joins in extending congratulations to those concerned for a job well done.

LAC R. HAMMEL

LAC Hammel was in the flight servicing shack waiting for the next BFI assignment.

As a section of four Sabres taxied by, heading for the runway, he noticed that one of them seemed to have an intake gun camera panel missing. Since he was too late to stop the aircraft himself, he immediately reported the problem to the squadron WO who was in the flight shack at the time. The WO contacted the main squadron building to have them phone the tower and stop the aircraft before it took off. This was done in time and on shut down it was found that the camera door had badly damaged the intake duct pitot head, punched several holes along the intake itself, and had come to rest lodged against the engine guide vanes.

It is probable, that through his alert attitude and quick action, LAC Hammel saved not only a valuable aircraft, but also something upon which no price can be placed—a human life.

F/L E.L. HARRIS
F/L P.T. MATHEWS
SGT A.F. SAVAGE
CPL W.A. BRYSKI
CPL D.W. SHORT
LAC E.J. GORDON

On 26 Nov 60, the weather at Sea Island had dropped to a low cloud base, with moderate rain. This condition had persisted throughout the normal working hours. At 0030Z, Vancouver RCC advised the unit that a fishing boat had reported that an aircraft had crashed on the beach one (1) mile west of Steveston, on the South Arm of the Fraser River and that fishing boats were enroute to the scene. Meanwhile the unit had alerted the stand-by helicopter crew, para rescue and para medic personnel. At 0105Z the fishing vessel advised RCC that it was proceeding to Steveston with one injured man and that two more men were still trapped in the crashed aircraft. The definite area of the crash was one (1) mile downstream from Steveston Cannery, and was situated between two electric cable poles, on the tidal flats. At 0110Z the helicopter with para rescue and para medic personnel on board was airborne on its way to the scene of the crash. Owing to the fading daylight, the fishing vessels would provide two vertical lights to guide the helicopter to the scene. Upon reaching the area of the crashed aircraft, it was observed that the aircraft was situated in an area comprising of tidal mud and medium deep pools of water. The pilots surveyed the area near the crash and decided upon a suitable landing area approximately thirty (30) yards from the wreckage, which was identified as a Cessna 175. Upon setting the helicopter down, it was noticed that the wheels started to sink and it was found necessary to maintain hovering power with the engine to keep the helicopter from sinking in the mud. The moment the helicopter touched the mud-flats, Sgt AF Savage and Cpl WA Bryski jumped out, carrying with them a collapsible litter; and rushed through the mud and water to the crashed aircraft. Upon reaching the crash, they immediately ripped off both doors to provide access to the injured occupants. The pilot was unconscious and the passenger semi-conscious. The passenger was checked by Cpl Bryski and was found to be the least injured, and he was removed, placed on the litter and carried to the helicopter by Sgt Savage assisted by a helping fisherman. In the meantime Cpl Bryski, working by flashlight, prepared the pilot for removal from the crash. Sgt Savage and Cpl Bryski completed the removal of the pilot and under extremely difficult conditions, carried the pilot to the helicopter. Immediately F/L EL Harris and F/L PT Mathew lifted the helicopter off the mud and raced for Sea Island. The helicopter landed at 0150Z, a Service ambulance with Medical Officers was waiting for the helicopter to arrive and immediately the unconscious pilot was transferred to the ambulance and rushed to hospital. The second ambulance arrived shortly and the second occupant of the crashed aircraft was rushed to hospital. Two days later the Neurosurgeon from the hospital called the unit and commended the personnel on the speed and and efficiency exhibited during the rescue, advised that such action was a main factor in the recovery of the injured pilot and passenger.

The successful conclusion of this emergency was due to the excellent team-work displayed by the helicopter pilots. para rescue, para medic and operations personnel. Altogether a Good Show of planning, skill and co-operation.

Rescue crew reading left to right: Cpl D. N. Short (Army) crewman, F/L E. L. Harris, captain, F/L P. T. Mathews, co-pilot, Cpl W. A. Bryski, para-rescue, Sgt A. F. Savage, para-rescue, (LAC E. J. Gordon, crewman, not available when photo taken).

The Big Gulp

All these stories about the jets gulping up mechanics, swallowing fully grown men! Did you ever wonder how many of them are true and how many are just scarey, hairy, fairy tales designed to keep apprentice mechanics inside the hangar washing parts?

You can stop wondering. Although much of the evidence has been buried, it is conclusive. These yarns aren't yarns. They are reports. They do involve the military, but civilian jets will act the same way. The suction created by jet engines is terrific—and deadly. A check made to prove this point can lead to trouble.

Before attempting to cross in front of an aircraft on which he was working, an airman stuck his hand in front of the intake, evidently to see how much suction there actually was. He was jerked into the intake immediately, losing his life.

Loose clothing adds to the hazard, so personnel working in cold weather areas must watch their step in icy and snow conditions. One fortunate Air Force mechanic who lived through his Jonah experience will never forget this.

He was descending a ladder and slipped when he touched the ice and snow, falling towards the intake. He was forcefully yanked into the duct. The parka he was wearing helped protect his head and body; however, by being unfastened and loose, it may have been the cause of his being pulled into the duct.

The Navy has had its incidents, too. A report datelined April, 1958 told how a carrier based mechanic was "shook up but good."

An F2H-3 had been given the light-off signal prior to launching. After light-off and a cockpit check, the pilot checked to the rear of the aircraft and requested a full turn-up.

While the aircraft was turning-up at 100% RPM, a mechanic went under the wing and unplugged the external starting power leads. He came out in front and to one side of the starboard intake. As he straightened up, he was sucked into the intake, hitting his head on the butterfly valve. He held on with both hands and kept his eyes shut. The pilot noted a drop in his starboard RPM to 80% as two men grabbed the mechanic's ankles and tried to pull him out of the intake.

As the pilot was being given the "cut" signal by the director, he saw the man in the intake. Both engines were secured, and the mechanic rescued, suffering only minor injuries. It was real nice those men were there and grabbed his ankles.

Many mechanics have not been as fortunate. In January an experienced crew chief at a Strategic Air Command base was sucked into a B-47 engine. His injuries were fatal. Since then, at another base, another mechanic was killed in a similar accident. His crew was pulling an engine performance check with the engine running at 100%. He crossed in front of the intake and was immediately sucked into the duct. Although the engine was shut down and he was pulled out within minutes, he died of major injuries.

Take our word for it, and the word of the Air Force and the word of the US Navy. Those gruesome stories are true! Both ends of a jet are dangerous.

Flight Safety Foundation
Aviation Mechanics Bulletin

FLYING THE CL-44

by G. T. "Scotty" McLean, CANADAIR

The CL44 is the commercial version of the RCAF CC106.

This article has been written solely for the preliminary information of pilots, both military and commercial, who will shortly be commanding this new and well-behaved aircraft.

Pilots should appreciate the fact that only handling information will be dealt with and lengthy discussions on systems can be shelved temporarily for rainy day reading.

GROUND HANDLING

Deleting all the obvious taxiing requirements applicable to most aircraft, there are some points connected with the CL-44 worthy of mention here. Pilots, long accustomed with the many manoeuvring problems of large aircraft, are in for a pleasant surprise. The CL-44 is the easiest taxiing machine that this pilot has handled for many a year. But first, some words about starting.

Our present order of engine starting is 2-1-3-4. Number two engine gear-box operates a cabin compressor, hydraulic pump and a constant frequency a.c. generator, and a variable frequency a.c. generator. Number three engine gear-box drives a cabin compressor and a variable frequency a.c. generator and finally, number four engine gear-box drives one variable and one constant frequency a.c. generator. So much for the philosophy of the starting order.

Tyne engine starting is simple but, as with any turbine engine, requires strict adherence to approved procedures and careful control of starting temperatures. Initially, we use air to accelerate the H.P. compressor to approximately 18% HPRPM. Engine control levers at this time are; Power levers at Ground Idle; Condition levers at Fuel Off. The appropriate Condition lever is then moved to the START position. This position provides correct starting fuel flow and ignition. The operator can expect an instant light up and a continuous acceleration of both the H.P. Compressor and the L.P. Compressor. When the L.P. Compressor reaches 19%, the Condition lever is moved to the lean trim position. This provides a higher fuel flow, and a rapid acceleration can now be expected. It is at this point that T.G.T. must be closely watched. However, for those of you who might worry about the problem of "Hot Starts", we have a cunning arrangement whereby merely lifting the Condition lever out of the LEAN trim detent, reverses the action of the Idling Throttle Valve and commences to cut fuel, thereby providing an easy method of control.

Now let's get moving. We have ascertained that, under most conditions, it is easier and provides more positive control to select all throttles to the Max Beta position for initial aircraft acceleration. Since you are selecting primarily a coarser propeller pitch with the throttle movement, you will be surprised to find your LPRPM drop from 75% to 69.5%. When the desired taxiing speed has been reached, it is only necessary to retard the Power levers towards Ground Idle to maintain this speed. From now on, by correct positioning of the throttles you can taxi slowly, quickly or backwards with ridiculous ease. Just remember however, that a rearward movement of the aircraft can be arrested sharply by moving the Power levers quickly from a reverse selection to Max Beta - undercarriages are not designed to take brake application in a rearward direction. Incidentally, selection of reverse entails nothing more than moving the Power levers rearward from Ground Idle. You will also find that aircraft reaction to reverse selection is very positive so therefore apply it gently from a static condition.

RCAF CC106

GENERAL HANDLING

Take-off, engine and propeller checks have been deliberately omitted from this article since these are easy and straightforward. In describing the take-off, we will assume a gross weight condition of 205,000 pounds and also an engine failure past V_1 speed. Since it is always nice to know whose hands are where, especially when considering an emergency situation, you must forgive the rather detailed sequence that follows.

The Captain selects all Power levers fully forward and, as the engines accelerate, releases the aircraft brakes. Concurrently, the co-pilot holds the control column forward of neutral and monitors engine instruments - especially torque gauges, for it is his primary function during the take-off roll to indicate verbally to the Captain the first indication of an engine failure.

During the initial aircraft acceleration, directional control is maintained by use of the nose wheel steering until such time as the rudder becomes effective - usually around 50 knots. Do not abandon the nose wheel control at this time, but rather maintain a loose contact so that a power failure at low speed can be dealt with instantly - directionally at least. As speed increases to 110 knots, the Captain should transfer his left hand to the control column with a verbal indication to the co-pilot that he is doing so. At speed V_1, the Power levers are relinquished to the co-pilot. At book value V_R, a smart aft movement of the stick will result in the correct lift-off speed to attain V_2.

Let's analyse our take-off procedure. One tries, during the testing of an aircraft, to honestly derive the maximum performance for the approved flight manual. I say honestly because the inserted figures must be within the capabilities of any knowledgeable pilot. We therefore prefer that the Captain maintains contact with the Power levers up to V_1 speed so that an engine failure before V_1 - which means a stop, results in a smooth movement of all the throttles into Beta, rather than the familiar wild grab which has often resulted in some rather comical combinations of power.

The co-pilot has been appointed the engine failure recognition expert for the simple reason that the Captain will not immediately recognize a failure, even of the critical engine, at the higher VEF speeds. Initially, the co-pilot also maintains a forward pressure on the stick to ensure a firm adhesion of the nose wheel with the runway. With a firm adhesion, a sudden failure of an outboard engine, even at low initial acceleration speeds, can be directionally dealt with by using the nose wheel steering control. It is therefore a safe procedure to maintain contact with the nose wheel control until through 110 knots. Although our VMCG is considerably below this figure, it stands to reason that a sudden decision to abort a take-off entails cutting power, applying brakes and keeping straight, and the last is much easier to accomplish with immediate use of the steering wheel.

An engine failure occurring during the latter part of the take-off roll produces no great immediate yawing effect. The engine will be producing some thrust even as the propeller is coarsening off, due to the action of the A.D.L.S. system. In most cases, a precious three seconds of runway length would be used up before the Captain could establish that he had actually lost an engine; hence, the use of the co-pilot to immediately determine the failure. If take-off is continued, the procedure is the same as that previously described. Considering the 205,000-pounds weight condition, maintain some forward stick pressure until just before V_R and then move the stick aft smartly at this speed (135 knots) and climb away at V_2 (140 knots). So much for take-off. Suffice to say the CL-44 is a well-behaved machine during critical or non-critical take-offs, providing of course you do it by the book.

FLIGHT MANOEUVRING

Continuing on, there is no point in describing all possible and probable manoeuvers but there are, of course, some points worthy of discussion here. Firstly, you will be pleased with the ease of selection of engine power and the light but positive flight controls. You can, at the lower levels, quite easily change LPRPM by as low a value as one-tenth of 1%. You can achieve the same minute control at the higher levels but, due to altitude effect, with a little less degree of ease. In all cases investigated, the cutting of high pressure fuel on outboard engines produces highly acceptable aircraft reaction. The mechanical propeller coarsening under these conditions is extremely effective and there is little need to jump on flight controls to maintain aircraft equilibrium. Only in the vicinity of the critical airspeeds, and especially at the demonstrated VMCA, is it necessary to move quickly on rudder and aileron.

Normal and accelerated stalls are docile enough for any handling requirements. However, in any configuration, and especially with power and full flap, continuing past the stall will eventually produce a very large wing drop. This has no bearing on official stall tests of this aircraft, but is only mentioned here because we have to investigate all factors relating to any particular part of the flight envelope. It also has no bearing on our product - except a favourable one, because those of you who know a DC-3 might recall that going beyond the stall in that old timer finally produced a unique but uncomfortable view of the ground.

Since the free floating type of main surface controls (See Canadair Service News Nov/Dec '59) will be new to most of you and you might have some reservations about their efficiency, I could easily dispel all worries by the sweeping statement that there will be no noticeable difference. Actually, with regard to both longitudinal and directional control, there is very little I wish to mention until we get to the landing techniques. The Hobson Feel Unit, interconnected to the elevator circuit, seems to confuse some people - that is the mechanics of the system, not the handling part. Suffice to say it is designed to restrict rapid movements of the elevator control (safety) and to provide the correct 'q' feel (handling) normally associated with airspeed changes. The loss of this system does not present any arduous handling problem to the pilot but, in effect, will produce a remarkably light "stick". This is, of course, the direct opposite to the effect of losing the powered portion of control systems associated with other aircraft. The only penalty connected with the failure of the Hobson unit is a loss of good centering characteristics.

The lateral control reacts quite normally but the method of employment causes the odd quizzical shaking of the head. Of course, there is nothing unnatural about the lateral movement of a control column. I would venture to say that most of you trained on aircraft with "sticks" so you will find you adapt very quickly to our "bicycle handlebars". What you will find with all our controls, and especially with the aileron, is a certain tendency to overcontrol initially. To explain this I will discuss the lateral control only since this appears to give new pilots the most trouble.

Even at high airspeeds, the initial "breakout" of the aileron is light; that is the force required to just start the control column moving. Since even a fraction of an inch stick movement will produce a correspondingly slight change in the servo tab, lateral displacement results. Now it is in this small area of the overall lateral control that some pilots will tend to misuse this system. Specifically, they will tend to continually move the control column about its particular trimmed neutral point and this will produce lateral aircraft movement. Of course, a larger movement will immediately produce natural stick force gradients. Prevention of the overcontrolling tendency is only a matter of realizing that there is really very little play or stretching in this type of control system.

LANDING

We now come to the most interesting part of any flight; the approach, hold-off and "gentle" reunion with terra firma. Although there is nothing unconventional about the landing techniques with the CL-44, as with all things, there are some tricks to the trade.

Basically there is no problem landing this aircraft, but you must realize the reasons for the technique which I will describe. Looking at the elevator control, we have three servo tabs per elevator connected to the control column and one tab per elevator connected to the elevator trim wheel. It is therefore essential, to provide full elevator power for landing, that all tabs be in harmony. In other words, nose-up trim should be applied just prior to rounding out to ensure that longitudinal control is fully effective. In the case of landings at the most forward C.G. limit, full nose-up trim must be applied. For those of you who will immediately worry about a go around with full trim selected, let me assure you that it is easily accomplished and with one hand controllability.

One more thing. All screw-jacks in the control system are of the variable ratio type. This means that towards the extremity of the control column movement, there is a rapid buildup in servo tab application. Therefore, to achieve smooth touch-downs, the bicycle grip must be somewhere near your lap just prior to contact.

Finally, you must also realize that you have a considerable mass to rotate from the approach condition to the correct landing attitude and that the centre of rotation is a block behind you. For this reason you will appear to be "high" during the hold-off.

Now let's shoot one. Circuit and approach speeds are kept low. Aim during final to descend at 5 to 6 hundred feet per minute and plan your airspeed and flap requirements so that there is a constant power reduction as the runway is approached. At the correct height above the runway, rotate firmly and then check slightly. Then hold off, ensuring that the control column comes back steadily to the fully aft position just at touch-down. As soon as possible, lower the nose wheel to the runway and then bring all power levers into Beta to provide as much propeller drag as you will require.

Thats all there is to it, and the above technique will ensure smooth touch-downs. The important thing to remember is the procedures and to understand the reasons for employing a particular method.

I have purposely refrained from discussing emergency procedures. Actually, if you know your aircraft, systems failures and breakdowns are automatically taken care of by an efficient crew. Any failures necessitating special handling by the pilot are easy and require only normal training procedures to ensure full knowledge.

In short, gentlemen, this is a solid, docile aircraft and a pleasure to fly and to those of you who will shortly be in command of a CL-44 - happy operations.

FIG. 7

I.A.M. Reports
on Inadvertent Inflation

The Institute of Aviation Medicine carried out a technical evaluation of aircrew knives. One phase of the evaluation was concerned with the puncturing of an inadvertently inflated liferaft or lifejacket in the cockpit. A survey has shown that there is no recorded instance of a liferaft inflating in the cockpit within the past 8 years, which is as far back as accurate records are available. In order to determine what would happen to a crew member if an inadvertent inflation occurred in a cockpit, four one-man liferafts were inflated in ejection seats in the Laboratory. A mannequin was outfitted to simulate a crew member and strapped into a CF100 seat complete with a 15D/273 Survival Kit containing a RFD 15F/201 Liferaft. The CO_2 bottle was fired by means of a wire attached to the operating head. On firing, the survival pack expanded raising the mannequin in the seat causing the seat harness to tighten. A corner of the survival pack opened slightly exposing the dinghy fabric which immediately burst and the liferaft deflated. Only 5 seconds elapsed between firing the bottle and the dinghy bursting. At no time was any part of the liferaft exposed so that it could have been punctured with a knife. Similar tests were conducted in a T33 seat using the 15F/201 Liferaft and the PK2 modified Liferaft. Similar results were noted with the PK2 Liferaft bursting in approximately 3 seconds. A further trial was conducted in the T33 seat with a 15D/229 Survival Pack and PK2 modified Liferaft using a live subject. The subject reported no ill effects other than a momentary tightening of the seat harness which was relieved as soon as the liferaft burst. Fig. 1 shows the survival pack before liferaft inflation and fig. 2 shows the expansion on inflation. Fig. 3 shows the bulged and damaged but still intact survival kit. Fig. 4 shows the ruptured buoyancy chamber of the contained liferaft. No inflations of this type were carried out in the cockpit.

Further trials in this phase consisted of inflating lifejackets in the cockpit of a T33 aircraft. Fig. 5 shows the standard 15F/187 Lifejacket in an uninflated state and fig. 6 shows it in the inflated state. Inflation of this lifejacket under tightly adjusted harnesses causes some discomfort and forces the head forward slightly. No inflation was undertaken in the air, however, there is no reason to believe that this would cause the pilot any undue difficulty in controlling the aircraft. There is a possibility that it could cause some interference with the helmet and oxygen mask. Stabbing this lifejacket with a sharp knife is considered hazardous. There is no difficulty in releasing the pressure quickly by means of the oral inflation tube valve.

A similar test was carried out using a Frankenstein vest-type lifejacket as used by the RAF and shown in fig. 7. As this jacket inflates outside the harness, no discomfort was felt but the view of the entire cockpit is cut off. This lifejacket can also be deflated easily by the oral inflation valve.

FINDINGS

It is evident that there is little likelihood of the liferaft inadvertently inflating in the cockpit, and if it did, it would certainly not billow out to fill the cockpit and jam the controls, as is popularly believed. Inadvertent inflation of the lifejacket in the cockpit would cause some discomfort but should not result in loss of control. The most suitable way of releasing pressure is the oral inflation valve. It would be advisable to have the valve in the unlocked position as this would decrease the time required to operate the valve and begin releasing pressure.

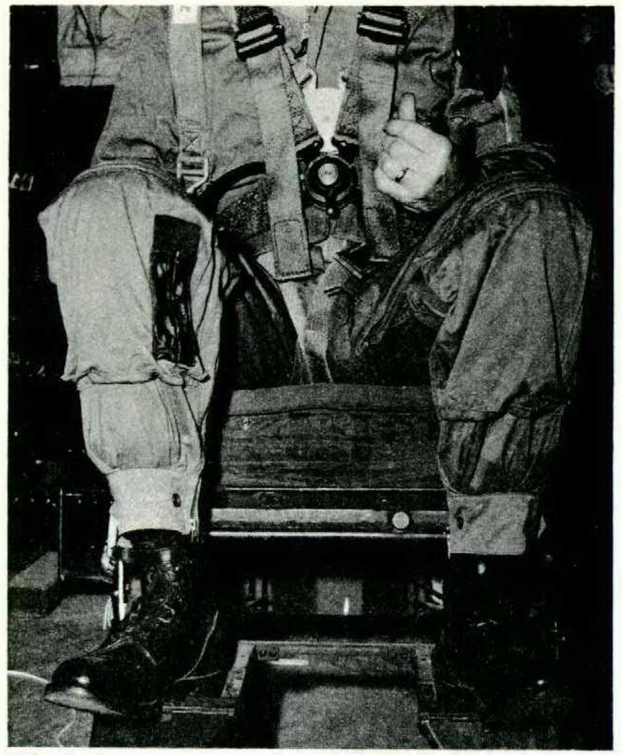


FIG. 1 Seat pack prior to liferaft inflation.

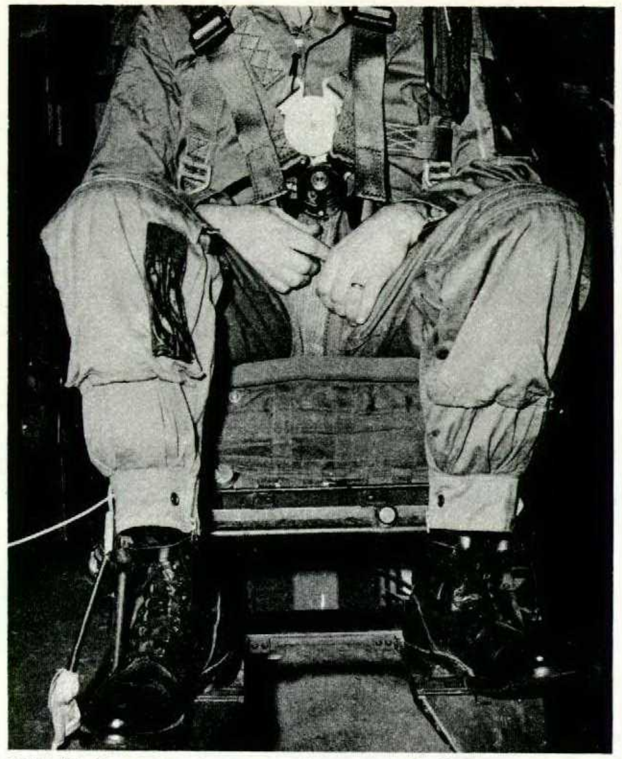


FIG. 2 Seat pack expansion on inflation.

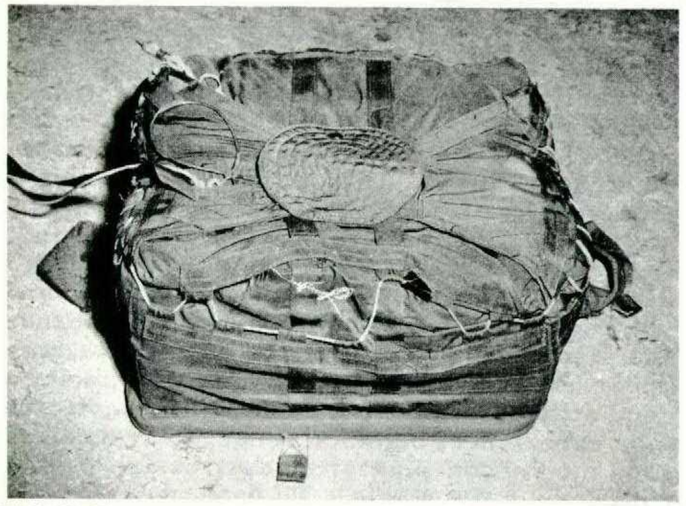


FIG. 3 Damage sustained by seat pack.

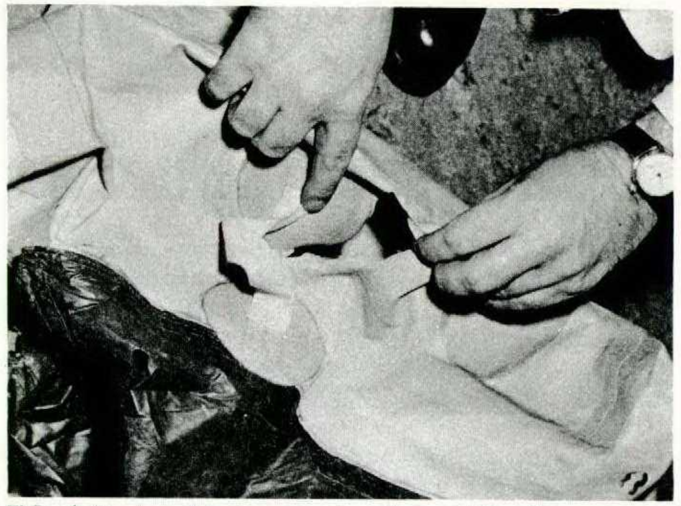


FIG. 4 Ruptured buoyancy chamber of liferaft.

FIG. 5 Lifejacket before inflation.

FIG. 6 Lifejacket after inflation.

S·A·F·E·T·

Yes, a small word but one that is most important in our lives from cradle to grave. Lack of it can make life tough; perhaps painful, it may cause an early arrival at the grave. An abundance of it is usually a good omen for a long pleasant life.

Safety isn't something that just happens. It requires a lot of thought, planning and work, not from 8 to 5 PM but constantly both on and off the job, 24 hours a day, 365 days a year. It makes no difference whether we dig ditches or manufacture complicated machines, whether we drive a shop mule or operate a nuclear reactor, and it is just as important to a child trying to master his first two wheeled bicycle as to a pilot completing a successful tour on 104's or what have you.

Looking at the word Safety we see six letters and if we take each one separately and match these with some features or points in a Safety program we can get an idea of just how much goes into giving this small word meaning in our everyday lives. These are just a few points, there are probably many more. Perhaps you can think of some.

The first letter can stand for supervision, an important part of any program. It follows us through our lives from the time we take our first few steps under mother's watchful eyes, into trade schools, professions and flying training under eagle-eyed instructors, Flight Sergeants, Station Warrant Officers, Flight Commanders. Then we find ourselves in a supervisory position supervising a million dollar flying machine, a crew and 50 passengers, a flight of young pilots, a maintenance shift or a towing crew. Our training, experience, book learning and plain old common sense are going to help us here. The degree of supervision we employ is going to effect the efficiency and safety of the operation both now and in the future, and equally important it will set an example to those under us when later, they themselves may be called to fill supervisory positions.

The next letter is "A" and could reasonably stand for attitude. All our training and experience, will be for naught if we adopt or employ an incorrect attitude to the job. We have all seen the effects of a lackadaisical or "couldn't care less" attitude in many walks of life, and similarly the aggressive or "me first" attitude has also had its effect, and is sometimes very apparent on our highways. The adoption of a good attitude comes from many things, training, experience, common sense, tolerance and good motivation plus an honest desire to do a good job.

Then we come to "F". This is a tough one, but perhaps facts and/or facilities could fit. An accurate and honest presentation of the available facts will in most cases prevent a horrible grope and hope nightmare experience. Proper facilities are ideal and in some cases a must, sometimes though existing facilities are overtaxed or understaffed or allowed to fall into sad states of repair. Where this happens accidents will inevitably occur unless sound procedures are developed and applied to the problem. Improvisation will perhaps overcome some problems temporarily but will never replace safe, proven procedures.

"E" is fairly easy, Education, Engineering, Enforcement and Experience are a few that fit in here, there are probably many more. Education is vital to any project and particularly to a safety program. Without education you couldn't even get started, and every avenue must be explored and every stone turned over in efforts to educate in safety. Books, slogans, posters, magazines, all should be originated and utilized not only by experts and specialists, but by everyone from the top on down. Engineering safety into everything is a must and starts with an idea, through the drawing board, development and into the finished product. Engineering may develop some things, faster than existing facilities can be expanded to meet the new demands. We have new modern high speed cars, but in many cases we don't have modern highways and roads to drive them on, or a garage, good enough five years ago, is too small for our new shiny monsters. New aircraft become bigger, faster and more complex and in many cases, hangars, runways, servicing facilities and control facilities become inadequate, but time and money are needed for new facilities and in the meantime rules, regulations and new procedures must be developed in order to make use of existing facilities. These new procedures, must be enforced. One can imagine the chaos on the highways on a summer Sunday afternoon if rules were not made and enforced. While we may detest the sight of a police car and its inevitable siren, statistics prove that sane laws energetically enforced do reduce accident and fatalities. In the Air Force too, regulations and procedures properly developed and energetically enforced will do much to reduce the accident rate. Experience can be costly in today's modern fast tempoed life, particularly your own experience. With modern machines it is too easy to wind up dead or injured learning from your own experience. Learning from the experiences of others has never been more vital, and experimenting with something you know little or nothing about has never been more dangerous.

Training is next to go along with the "T". Technological and engineering advances have increased the need for training and more training. The training necessary to do a job one or two years ago may be inadequate today in the light of new developments and methods. Increased training and knowledge should be constantly sought, both on and off the job.

Finally we get down to "Y" and of course to "YOU", the person to which all these Safety Programs and millions of dollars is aimed. Without you there would be no need for all this and all of the Safety Experts could go home and nurse their ulcers in peace and contentment. But here you are, the most vital part of safety. Without you to put all the letters together there isn't even a word, far less any safety. Think and act safety at all times, don't goof off when you should be extra alert, do that check and check it again. Pay just a little bit more attention to the job. With very little effort on your part you could put the Safety experts out of a job.

STEEL AN BOLT 125,000 PSI	AN BOLT ALUM ALLOY
STEEL AN BOLT CLOSE TOLERANCE 125,000 PSI	NAS 464 BOLT CLOSE TOL. STEEL 160,000 PSI
AN & NAS BOLTS COR. RES. STEEL	AN SCREW COR. RES. STEEL
STEEL NAS SCREW FULL THREADED 125,000 PSI	NAS SCREW HI-STRENGTH BRONZE 85,000 PSI
AN OR NAS SCREW STEEL 125,000 PSI	NAS 333 SERIES SCREW CLOSE TOLERANCE 160,000 PSI
AN SCREW HI-STRENGTH BRONZE 85,000 PSI	SCREW SELF-LOCKING

KNOW YOUR BOLTS

The selection of the correct bolt to do the job may not always depend on size and shape alone. To serve a wide range of installation requirements, bolts must also conform to certain standards relating to corrosion resistance, finish, material, temperature, tensile strength, and tolerance, and must embody other features such as special threading, self-locking devices, and head clearances.

Identification markings on the heads of bolts are the only safe criterion in selecting the correct bolt for a specific application. While most bolts and screws used in aircraft structures, components, and equipment are either AN, MS, or NAS (National Aircraft Standard) numerous cases exist where manufacturers have designed special bolts.

In cases where a special bolt is found in an installation, and a replacement is needed, it is of extreme importance that a like bolt be used for replacement. Such special bolts will have the part number on the head, or if the head is too small the mark "SPL" will be found stamped on the bolt head.

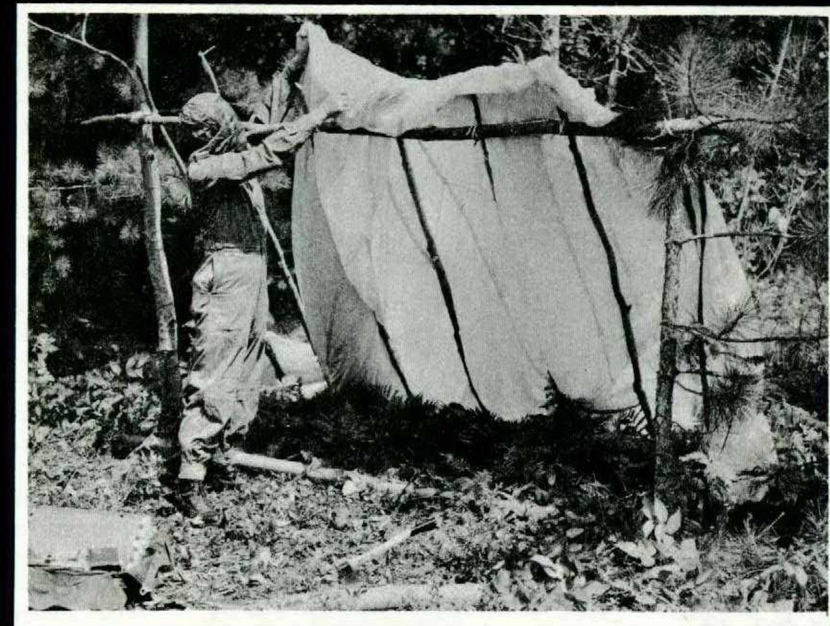
CANADAIR SERVICE NEWS

PLANNING AN UNEXPECTED OUTING?

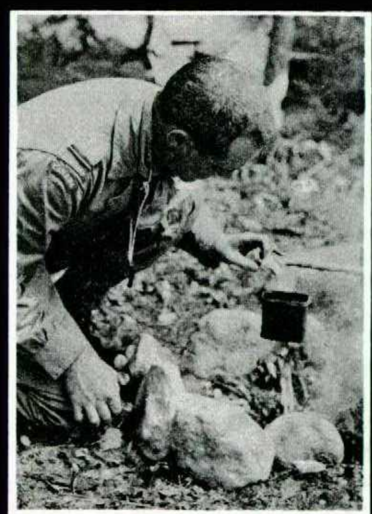
DFS LIBRARY
LIBRARY COPY-this pub must be returned.

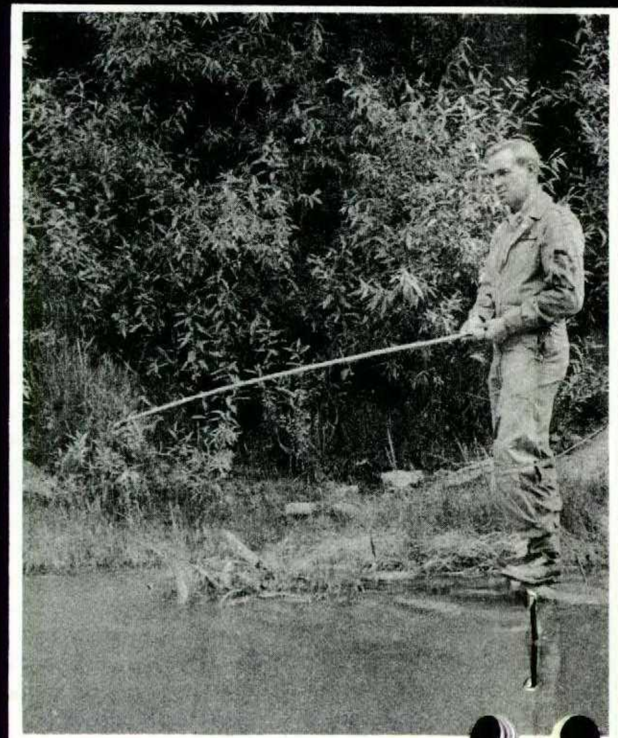

1. Down but not out.


2. What's next on the program.

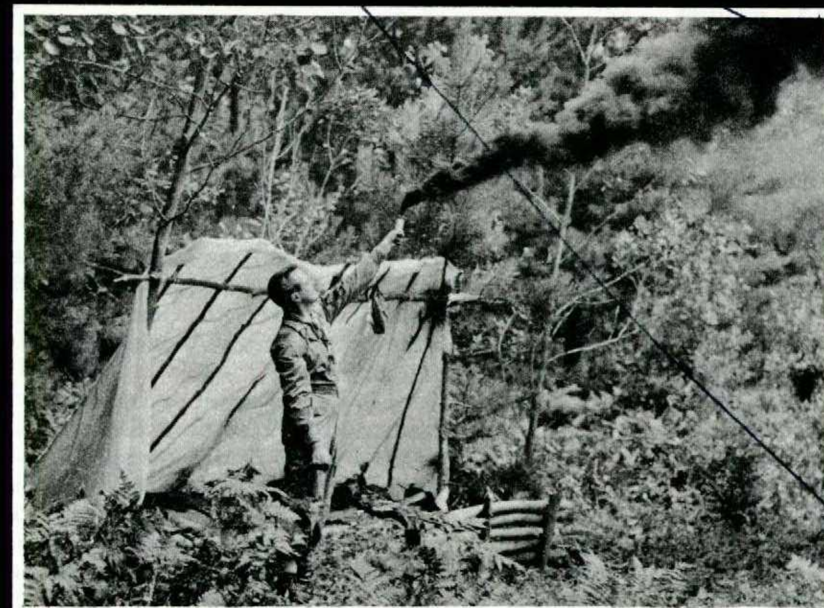

3. No motels—build your own.

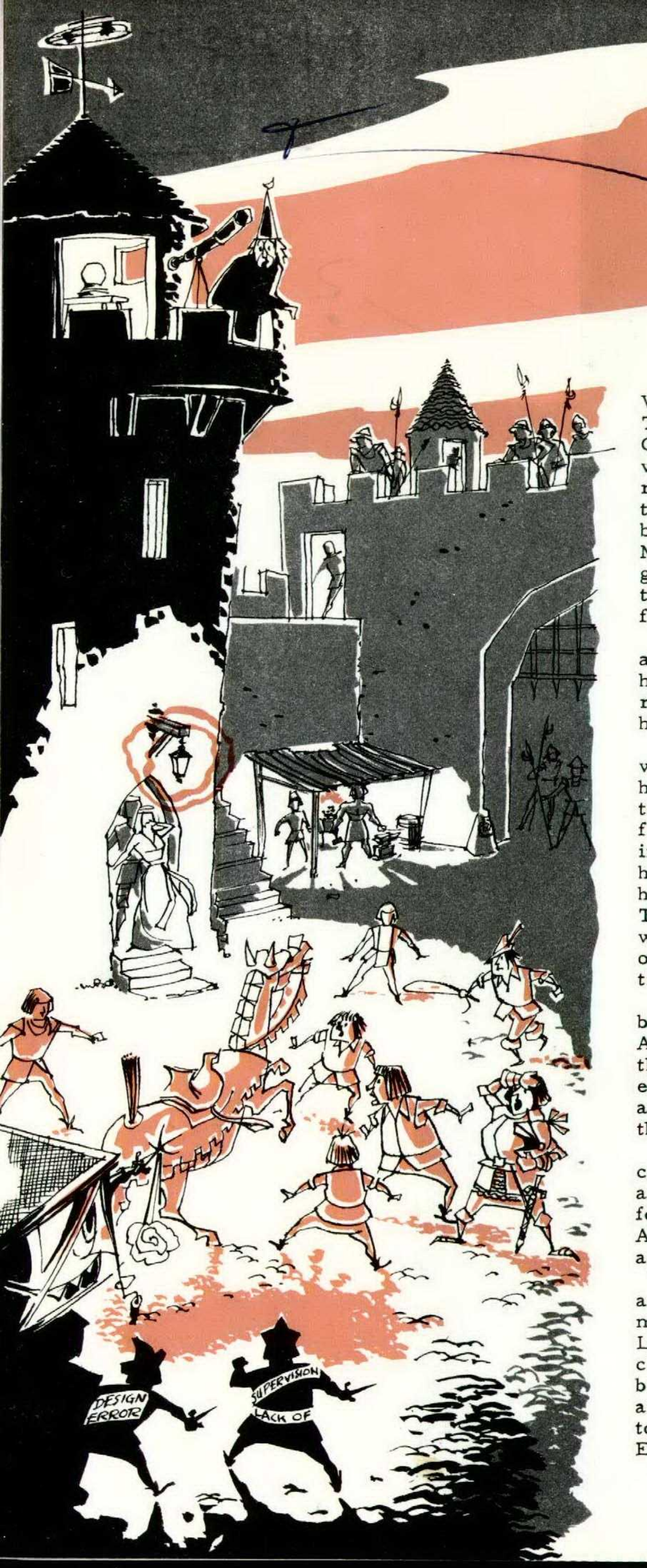

4. Settling in.


5. A spot of tea.


6. A spot of fishing.


7. Company arriving.


8. Rescued.



"YE GODS"

The scene was set in the beautiful Annapolis Valley, only this time it wasn't so beautiful. This was obviously a rare situation or so the Chamber of Commerce said. Anyway, the time was the witching hour, the weather was foul, raining cats and dogs and making things extremely slippery and treacherous when combined with previous snow and ice. The local Merlin had, after hours of crystal-ball gazing given forth a dire warning of high winds. At this point the Chamber of Commerce went south for the winter and apple growers shuddered.

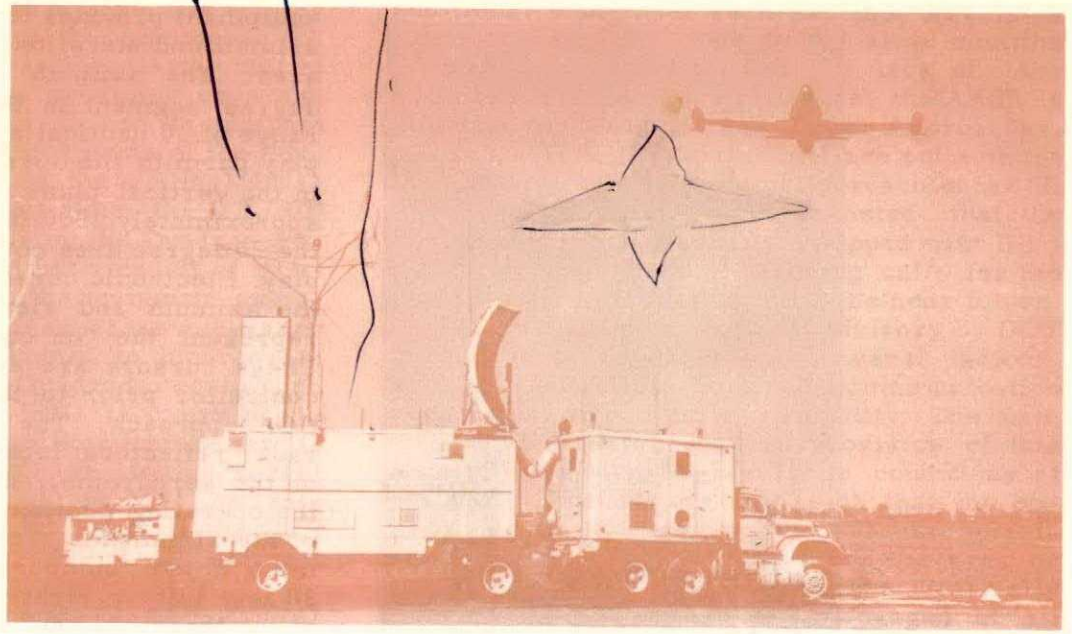
Meanwhile, at one of the local castles, serfs and peasants had been feverishly at work moving heavy Argus type chargers into wind. A feat requiring much skill and patience even with the help of lesser mule type beasts.

As our scene opens it is quite dark, and the wind is howling even though the local Merlin had forecast it. As our eyes become accustomed to the inky blackness, we see villains flitting about, obviously up to no good. There in the corner is good old Supervision, Lack of, he's been spreading the good word for some few hours now, even before our little scene opened. Then there's Design Error, he made sure there weren't any tie down lugs provided in the stable or courtyard, even though he spent considerable time and money putting them on the chargers.

Another villain is the one that said "parking brakes off" even in conditions such as these. A couple of other more obvious villains are the aircraft chocks with worn or missing cleats entirely useless for the job and old villain aircraft stand, tripping the light fantastic in the background.

But, hark ye, footsteps. From the cozy castle enters our hero, a knight in shining armour, or is it a wet parka. Oddsbodkins, forsooth and all that saith he, but too late, yon Argus has backed up and punctured itself against old villain stand.

Ye Gods, cries our hero, and the castle awakes. Knights and serfs, bowmen and horsemen gather and soon, Supervision, replaces Lack of, regulations permitting hobbling of chargers are made and aircraft stands are banished to the stables. New chocks are sought and at last the stable door is shut and bolted, too bad the horse is halfway to Cape Breton. End of scene.



RADAR AND AIR TRAFFIC CONTROL

"Airforce 764 this is Goose Approach Control - radar indicates CB buildup at 12 o'clock your position, range two zero miles. Turn right heading zero eight five, maintain three zero thousand, over".

As a result of this radio transmission from an air traffic control agency, an aircraft and its crew are spared the danger of flying through an area of thunderstorm activity.

Radar is rapidly replacing methods formerly used for the control of air traffic and the relaying of advisory information. The RCAF Air Traffic Control service first employed radar at Edmonton in 1948, when the Ground Controlled Approach unit at that station was handed over to the RCAF from the USAF. Since that time, RCAF air traffic control radar has expanded to the point where 33 GCA units and a complete Radar Approach Control (RAPCON) at Goose Bay, are now in use.

The use of radar to control air traffic has not been confined to the military alone. The Department of Transport, which is the civil controlling agency in Canada, has incorporated Airport and Airways Surveillance Radar (AASR) at 15 civil aerodromes and is currently planning to equip some of the major terminals with a Precision Approach Radar system.

With the introduction of the various forms of radar into the Air Traffic Control service, the flow of IFR traffic is handled more efficiently than ever, and the acceptance rate of aircraft has been substantially increased. The radar in use by both military and civil agencies is as accurate as that used by any country in the world, however, as with any piece of equipment, there are limitations.

The military utilizes three types of GCA equipment which are as follows:

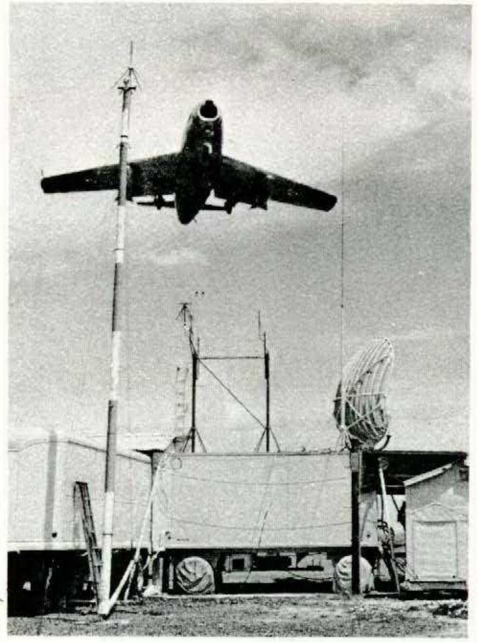
(a) AN/CPN 4

(b) AN/MPN 11

(c) AN/FPN 36 (Quadradar)

The first two types mentioned are, for all practical purposes, identical in appearance and utilize essentially the same radar equipment. There are 17 CPN4/MPN 11 units in the RCAF and one will be found at most aerodromes subjected to high density traffic. This GCA unit provides three complete operating positions, consisting of a Surveillance indicator, a Precision indicator, and a complete communications system at each position. This arrangement enables operating personnel to process IFR traffic through the system, landing conventional or jet aircraft two minutes apart.

The principal role of the Surveillance radar is to locate, identify, and then direct an aircraft through a predetermined traffic pattern to a position for the final approach to the instrument runway. A secondary role for this system is the provision of Surveillance Radar Approaches to runways that are not covered by the precision system. Surveillance Radar Approaches are made with reference to the Surveillance indicator only. As no elevation data is available on this indicator, operating personnel can only direct the aircraft to the runway and advise the pilot, at specific ranges, the MSL altitude that the aircraft should be at. The pilot, in turn, must consult his altimeter and make any vertical speed adjustment necessary. Due to the inability of the Surveillance radar to portray accurately the position of the aircraft in relation to the runway centreline,



AN/MPN 11

and lack of positive elevation control, the limits and tolerances are considerably higher than those for a precision approach. A Surveillance approach is expected to be accurate to within 500 feet right or left of the runway centreline at a range of 1 mile. If the pilot is not visual and in a position to land on reaching surveillance limits, the approach should be discontinued and a missed approach initiated. The Surveillance radar provides 360 degree coverage for a range of 30 nautical miles, and is capable of detecting an aircraft in this area up to altitudes of 17,000 feet with a maximum capability of 35,000 plus. In order to obtain the maximum, however, it is necessary to change the angle of tilt of the Surveillance antenna. This creates no problem mechanically, but as the angle of tilt is raised, aircraft flying at the lower altitudes are no longer visible. The Surveillance radar, therefore, is not capable of providing both high and low altitude coverage at the same time. This will occasionally restrict the GCA operator in providing jet aircraft with radar monitored approaches from altitude, and radar monitored departures to altitude. This restriction is more likely to occur when Surveillance Radar Approaches are being carried out. A more recent addition to the Surveillance system is the IFF/SIF equipment, which is used for identification. This system has practically eliminated the time consuming method of turning aircraft in different directions in order to establish positive identification. The use of this equipment greatly reduces the possibility of misidentification, but in order to achieve total success, both aircrew and ground personnel must be completely familiar with the operation of the equipment. Should any uncertainty exist, the unit STelO should be able to clarify the procedures to be used when operating this equipment.

The precision system on the CPN4/MPN11 equipment provides the controller with precise azimuth and elevation data in the final approach area. The azimuth presentation covers a 20 degree segment in the horizontal plane to a range of 10 nautical miles. The elevation display permits the operator to observe aircraft in the vertical plane to a maximum altitude of approximately 3500 feet, above ground, within the 20 degree area covered by the azimuth display. Electronic cursors are portrayed on both the azimuth and elevation presentations and represent the "on course" and "glide path". These cursors are accurately aligned by the controller prior to the commencement of the GCA approach. The controller makes use of radar reflectors, located at surveyed positions on the aerodrome, and a voltmeter located at the operating position, to ensure the accuracy of the alignment. The controller must determine if the "on course" is accurate to within 30 feet left or right of the runway centreline at the threshold, and the "glide path" accurate to within 15 feet of the established glide angle. If these tolerances are exceeded, by malfunctioning equipment, the GCA unit is declared non-operational for precision approaches.

"Ground clutter", or permanent radar returns of any nature, creates no problem when operating CPN4/MPN11 equipment. An electronic system, known as Moving Target Indicator (MTI) is incorporated in both the Surveillance and Precision radar. This system will cancel out all stationary radar returns and permit the operator to track aircraft through areas that would be otherwise completely blotted out.

The CPN4/MPN11 is a well proven instrument approach aid and has provided the foundation for terminal radar control in the RCAF. It is planned to use a modified version of this equipment to provide the radar data necessary for full RAPCON facilities at four RCAF aerodromes.

The secondary, and more recent, GCA facility to be employed by the RCAF is commonly referred to as Quadradar. There are 15 "Quads" actively in use in the RCAF and are located at aerodromes not normally subjected to high density traffic, and also at advance deployment airfields. The Quadradar was designed as a multi purpose, tactical, GCA unit which could be easily transported and relocated at a different aerodrome with a minimum loss of time. The name Quad derives from the four roles that this equipment is capable of playing. These are: Surveillance control, Precision control, Airport Taxi control, and Height Finding. The capabilities has only one indicator available and, as a result, only one of the four capabilities can be utilized at a time. This restricts the GCA operation, as a single aircraft could conceivably engage the equipment for periods up to 20 minutes and in some cases even longer. One very appealing feature of the Quadradar is its ability to provide

precision coverage on more than one runway without having to relocate the equipment. A good example of this versatility is the unit at Winnipeg, which provides precision coverage on five runways. The Quad, due to its compact configuration, has sacrificed some of the "extras" that are available on the CPN4/MPN11 equipment. At the present time, the IFF/SIF equipment is not available on the Quadradars. This was not an oversight but a result of technical obstacles, however, the equipment manufacturer has recently engineered the necessary modification and it is planned to incorporate this modification into the Quadradar equipment. This will give complete IFF/SIF capability to all RCAF GCA units. Another feature that is not available on the Quads, is Moving Target Indicator (MTI). The lack of MTI on this equipment will occasionally restrict the GCA operator in effectively following aircraft through areas of severe ground clutter.

GCA personnel operating either CPN4/MPN11 or Quadradar equipment may encounter some control difficulties with the presence of moderate to heavy precipitation of the radar. A device known as Circular polarization is installed in the Surveillance and Precision systems of both equipments. This feature has great effect on the elimination of light rain or snow areas, however, areas of moderate to heavy precipitation cannot be completely eliminated, and the tracking of a T-33 or other small dimension aircraft, in these areas, is most difficult. When the Circular polarization is not engaged, GCA personnel are able to detect and clearly plot thunderstorm activity, or approaching precipitation. The relaying of this information proves quite beneficial to both aircrew and meteorological personnel.

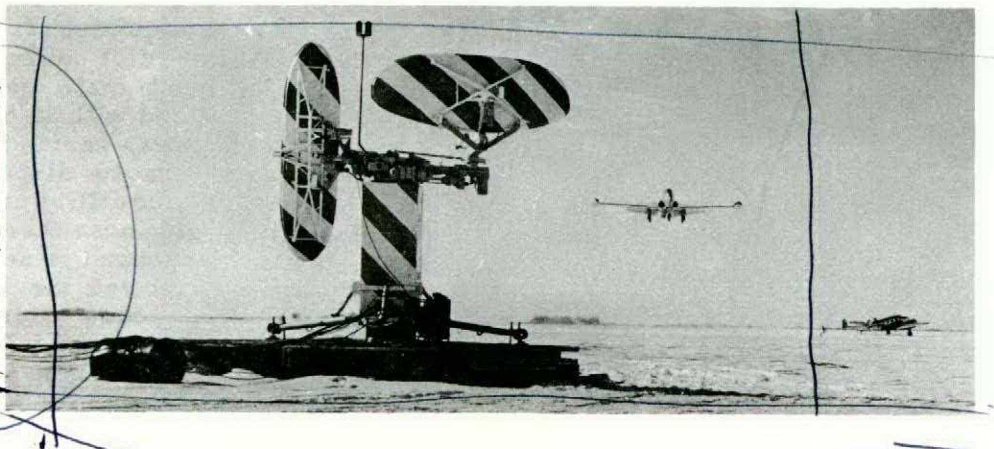
The AASR radar that is in use with the Department of Transport provides simultaneous high and low altitude coverage in the horizontal plane, but has no height finding capability. This radar has a maximum range of 150 nautical miles and is capable of detecting aircraft to altitudes of 50,000 feet, which permits effective approach and departure control. Unlike the GCA equipment, the AASR is used to position aircraft at specific locations only, and the final approach is made with the aid of additional equipment such as, ILS, Precision radar, LF beacon. Due to the slow rotation of the radar antenna, and the lack of clear definition at the shorter ranges, the AASR is suitable for Surveillance Radar Approaches, and as a result, DOT personnel are not authorized to carry out this type of approach on AASR equipment. It should also be noted, that the DOT AASR is not presently equipped with IFF/SIF, however, current planning calls for the incorporation of this feature in the near future.

The provision of weather advisory by DOT personnel is dependent on several factors, such as controller workload, communication congestion, or equipment capability. The main determining factor for the provision of this service will usually be traffic conditions at the time. Traffic must be such that the operator is able to disengage the Circular polarization, momentarily, and check the area or applicable sector for precipitation. Normally the Circular polarization is engaged at all times and, as a result, areas of precipitation are not always detected. It must also be appreciated that distant storms, except those of a severe nature, will not be detected by this type radar, even with the Circular polarization disengaged. In light of the foregoing, aircrew personnel should request weather advisory, and not rely on automatic provision of this service.

The preceding has briefly outlined the various types of radar equipment that are in use with the Air Traffic Control service of both the military and civil agencies in Canada. As stated earlier, the introduction of radar into Air Traffic Control has greatly assisted the handling of instrument traffic. It might be interesting to note that in the year 1960, RCAF GCA units completed a total of 130,738 GCA approaches and, of this total, 26,266 approaches were made under IFR conditions. This will give you a rough idea of the amount of traffic that is handled by this equipment.

Aircrew personnel who have GCA equipment at their "home base" should pay a visit to the unit and see first hand how the operation is conducted from the ground. A better understanding of equipment capabilities and operating techniques makes for a better instrument approach.

AN/FPN 36 (QUADRADAR)

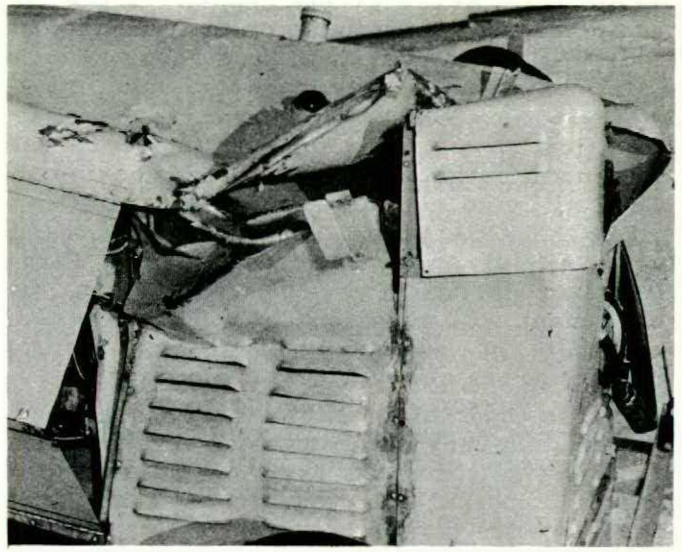


Arrivals and Departures

SQUEEZE PLAY

During routine refuelling of energizers a hangar door was lowered on an energizer resulting in considerable damage to both the door and the energizer.

While no aircraft were involved in this inci-



dent, this "bone-headed" mistake resulted in the energizer being unavailable for the use for which it was intended and numerous man-hours and dollars being spent on repairs. Altogether an unnecessary and costly mistake. Remember safety is not only essential in the cockpit but everywhere even on routine jobs like closing hangar doors.

UNSAFE GEAR

During a GCA approach after a night navigation exercise, the pilot noticed an unsafe indication on the port main gear. Emergency lowering was utilized with no change indication. A normal landing was carried out.

While taxiing in to dispersal, nosewheel steering was lost and utility pressure indicated 800 lbs. On engaging nosewheel steering button, utility pressure dropped to zero.

Investigation showed the unsafe indication was caused by a broken micro switch lead on the port main landing gear. The loss of pressure, was the result of a faulty emergency lowering selection valve, Ref. EO 05-5E-4, Fig. 191, Item 13, Sec/Ref No. 27Q/910. When the emergency system was activated this valve allowed fluid and pressure to bleed off to atmosphere, possibly through defective or deteriorated "O" rings.

While the D14 is somewhat sketchy Flight Comment questions the airmanship involved in taxiing an aircraft with an unsafe gear indication.

~~POW!!!~~

FIZZ — let down in text

During a PI when the external power was on and battery connected, an electrician noticed a shiny object on the cockpit floor by the rudder pedals. On reaching down to retrieve the object, a nickel, the airman's parka hood caught the canopy jettison switch and the canopy links blew off.

In as much as the PI was done in conditions requiring the airman to wear a parka, and external power was applied to complete the electrical portion of the PI, extra care should have been taken to avoid loose clothing coming in contact with and inadvertently actuating switches. Continually warnings and briefings are a must to reduce and eliminate this type of accident.

TO FASTEN OR NOT TO FASTEN ?

After some work had been completed on the aircraft the left door installation, Engine Lower Access Pt #174586 was temporarily closed using the forward dzus fastener, only, (the door has 17 dzus fasteners) while the engine was run up to check for fuel leaks.

After a successful run up the aircraft was signed out serviceable even though 16 of the 17 dzus fasteners on this door were not fastened. Later the door came open in flight causing damage and requiring replacement of both doors.

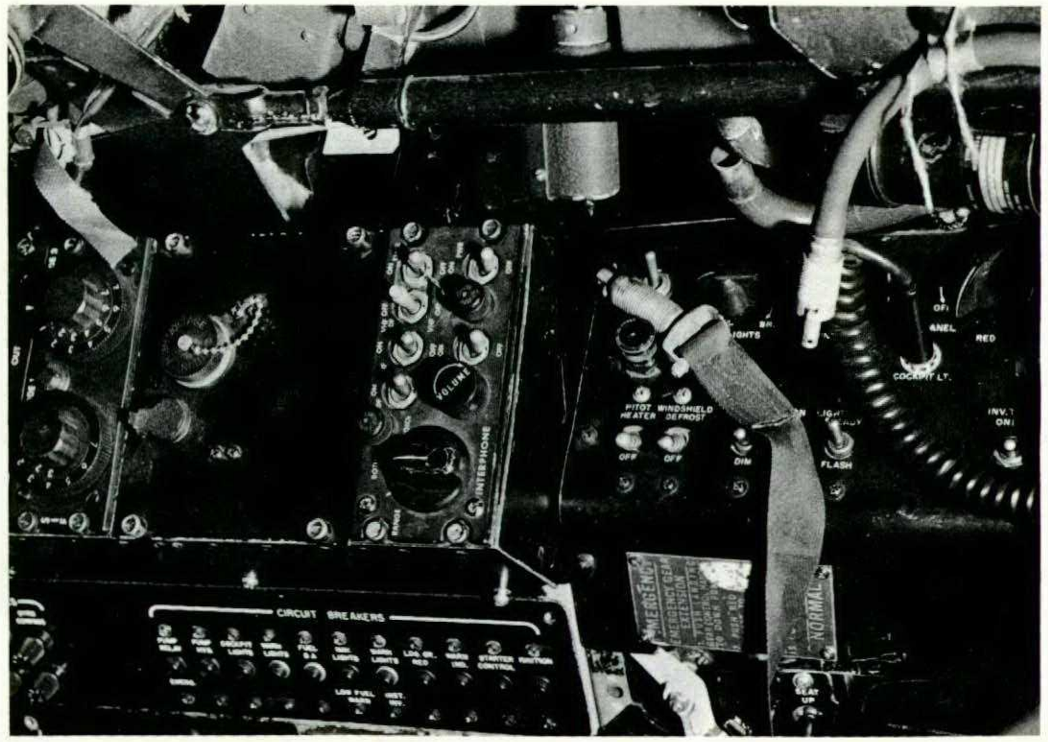
An alarming number of incidents such as this are being reported, anyone of which could lead to a fatal accident. Groundcrew, double check those fasteners, the aircrews' lives may depend on it. Let's go to work and "Batten down the Hatches".

DESIGN

While taxiing in, after a flight, the pilot disconnected the dingy lanyard and laid the end of it on the VHF console.

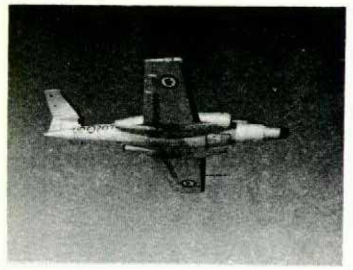
The metallic end apparently slipped behind the console and shorted between the VHF power switch and the frame of the aircraft causing sparks and smoke. Removal of the lanyard from behind the console cleared up the problem.

While the pilot, erred in disconnecting equipment before the aircraft was shut down, the



faulty design which would allow any number of odd objects to fall behind the panel and cause shorting, perhaps under more disastrous conditions, was the main culprit in this case.

An awareness of the problems and immediate UCR action can catch odd faults such as these before they can cause the disaster they are inviting.



FIRE WARNING

After a practice scramble intercept about 250 nms north of Chatham, the aircraft was proceeding back to Chatham when the port engine fire warning light came on. The Nav was informed, power reduced to idle RPM and IFF turned to emergency. After approximately 10 seconds, during which time, temperature and pressures appeared normal, the warning light still remained on. The engine was flamed out and the low pressure cock turned off and still the light remained on. The port engine fire extinguisher was used and the light went out. All unnecessary electrics were turned off and under close GCI control the aircraft was returned to Chatham.

On inspection of the engine no evidence of fire was found and it is suspected a short circuit of the fire detector lead wires was the probable culprit in this case. ANOTHER FALSE FIRE WARNING.

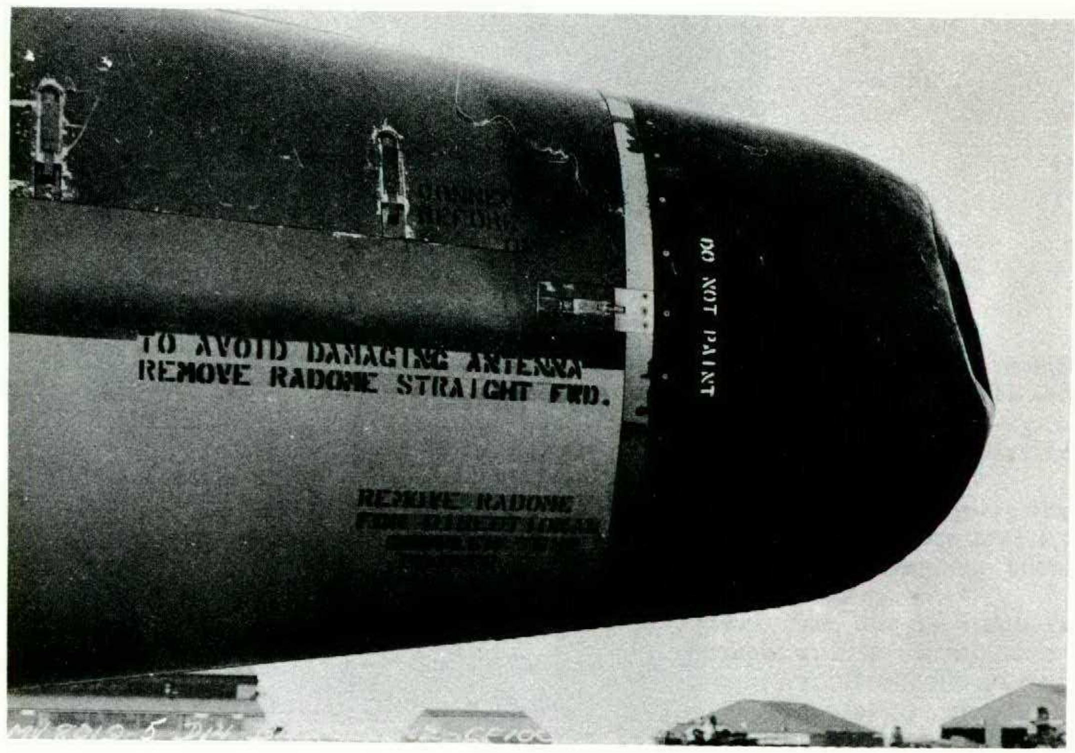
BIRD STRIKES

During a recent GCA approach two aircraft in formation about 15 miles back from the runway at 2500 feet, were advised by GCA of a target at 11 o'clock, 3 miles, which appeared to be stationary.

Both aircraft were VFR at the time but neither pilot could see the target. They were then advised that the target was now at 12 o'clock and only 1 mile. Still nothing could be seen from the aircraft, but immediately thereafter No.1 saw a flock of birds and both aircraft flew through the flock sustaining damage. No.2 pulled out of formation and No.1 throttle right engine to idle because of vibration and high JPT. No.1 declared an emergency and landed single engine straight ahead on the runway. No.2 meanwhile overshot and landed behind No.1.

The two aircraft sustained 15 bird strikes. No.1 needed the right engine changed and both aircraft suffered damage to various parts of the airframe.

The GCA controller could not identify the target but assumed since the aircraft could not see it even though they were VFR, that it was above or below them. GCA controllers have been advised of this phenomena and warned of the necessity for issuing avoidance instructions when needed.

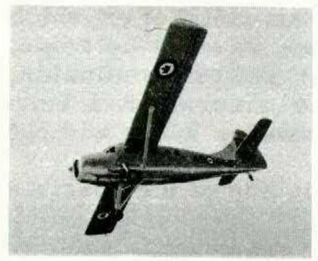


TAKE YOUR TIME

During a recent scramble the pilot and Nav of the lead aircraft ran out to their aircraft and commenced to strap themselves in. There was only one airman to assist the crew and start the aircraft. After being strapped in and while the airman was assisting the navigator, the pilot after warning the airman, started the starboard engine.

While waiting approximately two minutes for the airman to complete strapping in the navigator and hand him his mask and head set, the No.2 aircraft obtained taxy instructions and started to taxy. No.1 in accordance with squadron SOP told No.2 to hold his position. When No.1 moved forward the starboard outer flap struck the APU knocking it over and causing damage to the flap.

The pilot's haste to get airborne on the scramble, compounded by the slowness in having only one airman to assist, is perhaps understandable. The resulting accident due to his failure to allow the airman sufficient time to move the APU out of the way, and his failure to check his taxy path clear of obstructions is inexcuseable. There are no excuses for taxy accidents.



OVER CONTROL

While carrying out a CAIR acceptance flight, a pilot, current and proficient on type pushed the control column forward during a bounce on landing in gusty wind conditions.

All three propeller blade tips struck the runway sustaining moderate damage. Apparently no damage was inflicted on the runway. Proof that propellers will never replace pneumatic drills for breaking concrete.

HOOKED

While on circuit practice in a dual control Otter aircraft, a pilot, accompanied by a co-pilot, occupying the right hand seat, received clearance for a stop and go landing.

After a normal landing the pilot completed the pre takeoff check and commenced to take off. On application of TO power, right aileron was required to maintain directional control in a crosswind from starboard. On becoming airborne the pilot attempted to level off, but was unable to move the control column forward.

At this time the co-pilot, who had been sitting well forward to improve his view of light traffic on a converging runway, realized the right hand control column had hooked into his shoulder harness. After a momentary struggle, the co-pilot operated the quick release, freeing the control column enabling the pilot to regain control of the aircraft.

This incident could well have caused the crash of this aircraft, and aircrew and crewmen should take note of the possibility of interference with control column movement, particularly when sitting forward and under critical circumstances, like landing and taking off.

ON THE BALL

During an IFR flight at night, maintaining 5000 feet, approximately 10 miles east of Gore Bay, the port engine failed. Unable to determine the cause of the failure the pilot feathered the engine and decided to land at Gore Bay.

The weather at Gore Bay was 800 feet overcast with 5 miles visibility and the wind northeast at 20 mph. A successful single engine range approach, runway orientation and landing were carried out.

Investigation of the feathered engine found metal contamination of the filters and large pieces of metal in the sump. This metal appeared to be from a collapsed piston and material failure is presumed, pending strip report from the contractor.

The crew handled the emergency in a truly professional manner.

MURPHY'S LAW

During a P500 post check run-up and after approximately 10 minutes running time, fire was detected in the port engine. The engines were stopped and the fire extinguished.

Subsequent investigation revealed that the flapper valve ref 27VA/670 valve check in the pressure line from the oil separator had been installed backwards. Apparently this allowed sufficient pressure and heat to build up between the pump and the check valve to cause compression ignition of the oil. It appears the fire could occur either in about 10 minutes running time or on application of take off power for approximately one minute. An embarrassing situation had it occurred during takeoff.

Murphy's Law - If an aircraft part can be installed incorrectly, someone will install it that way.

FLAP HINGE FAILURE - C119 AIRCRAFT

With the introduction of the C119 into the RCAF, the maximum speed for lowering flap was indicated in the then existing AOIs as 140 knots. Subsequently C119 standard operating procedures were introduced by ATC indicating that it was permissible to lower 14° flap at 160 knots. This practice of lowering 14° flap at 160 knots was continued for approximately seven years without authority of the AOI.

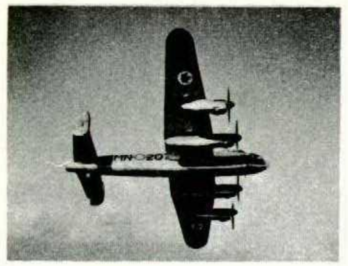
As of June 1960 the C119 AOIs were amended to include permissibility of 14° flap lowering up to 160 knots. Investigation has revealed that the flap lowering speed has never been approved by AMC or the aircraft manufacturer. Introduction of 160 knots maximum lowering speed crept into AOIs because of previous authorization in SOPs.

As a result of the increased loading, inboard flap hinge failures began to occur which were attributable to fatigue caused by overstressing of the hinge. Failure of these hinges created a real flight hazard, wherein it was possible to jam the aileron controls through fractured bellcrank, distortion resulting from flap twisting, or damage the horizontal stabilizer should the flap completely break away from the aircraft.

In order to ensure that the flight hazards were eliminated, operating crews were directed to carry out flying operations without the use of flap until all hinges were replaced. A new hinge constructed of aluminum which is stronger than the previous magnesium hinge has been prototyped for replacement purposes.

AOIs have been amended to reflect a maximum flap lowering speed of 140 knots.

As a result of this case a valuable lesson has been learned. At no time should design specifications be exceeded without the approval of the design authority. In addition, standard operating procedures issued by a command should never exceed limitations as reflected in existing aircraft operating instructions.



OIL LOSS

During local instrument practice flying, a Lancaster with the first pilot on the controls completed a GCA approach and was overshooting when oil began venting profusely from the No.3 engine. The engine was feathered and a successful three-engined GCA and landing carried out.

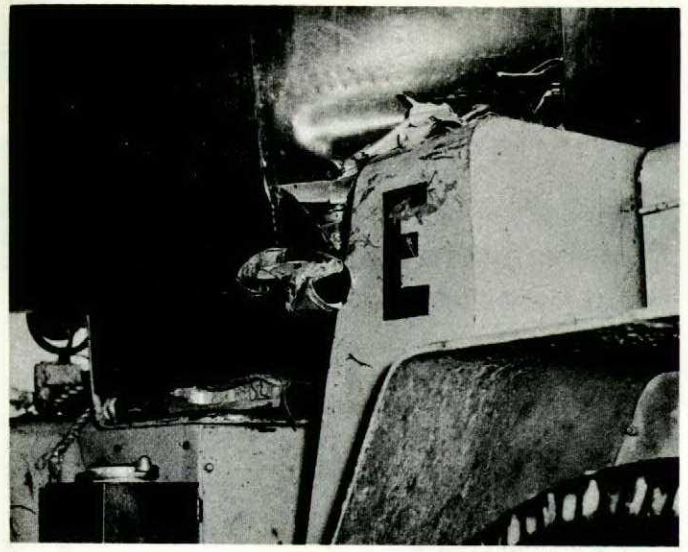
A check of the collector box and scavenge filters showed excessive amounts of oil which was drained out. The engine was run-up twice, and air tested for one hour and thirty minutes, with no recurrence. The aircraft had been flown for approximately twenty hours without any sign of excessive oil.

While no proof exists in any of the possible causes, the venting could have been caused by over-dilution with insufficient boil off, a sticky oil dilution solenoid, or over-filling the oil tank and subsequent expansion of the oil. Oil in the collector box could have accumulated through failure to drain it on previous DIs.

ADVERSE CONDITIONS

Recently a Neptune required for the day's operations required a retraction test before it could be declared serviceable.

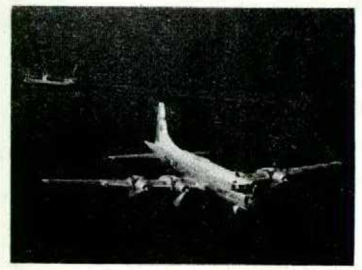
At 0600 hours it was decided to move the aircraft from its position to a Cantilever hangar for the retraction test. It was dark and snowing and snow removal operations were being carried out. The towing crew dispatched a second tractor with two airmen to precede



the towed aircraft to check snow removal equipment and possible obstructions.

Arriving at the Cantilever hangar it was found the hangar doors were frozen shut and a decision was made to return the aircraft to its original berth. On the return trip, the lead look-out tractor stalled and due to snowy and slippery conditions the aircraft could not be stopped in time and the port jet pod struck the look-out tractor inflicting damage.

In view of the weather and conditions existing at the time, this was an extremely hazardous operation and although the crew took reasonable precaution, perhaps it would have been easier all around to wait for better conditions.



HELP WANTED

Several instances have occurred on Argus aircraft involving generators and the Constant Speed Drive between the engine and the generators.

This Constant Speed Drive is equipped with a clutch and shear pin, and trouble develops in this area. General cockpit indications, indicate generator failure and do not show the reason, so the engine has to be feathered to prevent possible further damage.

Until such time as a remedy is found for the drive problems, feathering the engine seems to be the only recourse. Squadron orders cover this eventuality and aircrews are to be congratulated for their knowledge of the problem and adherence to squadron orders.

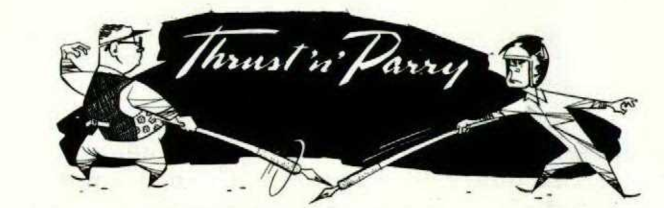
TRUE OR FALSE ?

Shortly after takeoff and soon after the wing and tail heaters had been turned on, the fire warning bell rang and the red light came on. The flight engineer reported a fire warning in the port heater. Fire procedure was carried out and the extinguisher fired, but the light remained on. Visual checks showed no evidence of fire.

Fuel was dumped and a GCA approach and landing were carried out with no further incident. The fire warning light remained on throughout until shutdown.

Investigation of the forward bomb-bay areas where the heaters are located, revealed no evidence of fire, but a grounded fire detector switch interconnecting lead wire, part No. W408/B20, was found. The ground occurred where the lead passes through a rib opening. Constant vibration in the air of the lead against the rib, wore through the insulation and caused a ground.

A new lead was installed and clamped to prevent an occurrence of this nature and UCR action taken.



LETTERS TO THE EDITOR

Dear Editor

I read with as much dismay as interest the Near Miss report in your Jan-Feb 61 issue concerning the pilot who set out from Wiarton for North Bay and landed in Syracuse. It would be comforting to be assured that the incident was not closed with this confession. It seems to me an indication of a weakness in our basic airmanship training. If I may be blunt, anyone who steers 107 M from Wiarton for North Bay deserves to get lost. It seems scarcely conceivable to me that such a person could qualify for an aircrew brevet, much less for an instrument rating. It may interest you to know that I asked my FS, who hasn't flown since he was shot down in WW II, what the approximate track would be, and, after a moment's thought, he answered "050".

It seems to me that there has been an increasing tendency for some years for aircrew to concentrate on navigational aids and forget navigation itself. It may also be that since pilots constantly plot magnetic headings, they tend to forget the relationship between the "number" they are steering and the geographical realities involved in going from A to B. I think too, that the format of the RFCs contributes to this unhealthy situation.

There is no doubt that pilots of modern, high-speed, short-endurance aircraft, have a great many things to think about in a short time, which is all the more reason they should not forget fundamentals.

G. J. Williams, S/L
AFHQ/DOE

Dear Editor

Regarding your inside cover photograph of Flight Comment Jan-Feb 61 of an accident potential in the form of a transistor radio.

There is another accident hazard in the subject photograph. We hear all too often of accidents caused by small obscure objects jamming controls, etc., in aircraft. It seems to me the watchband worn by the person displaying the offending radio should have been discarded some time ago. Watchbands in this condition usually find their way into the vitals of the aircraft, along with the cigarette lighters, pencils, flashlights and other items of hardware.

D. L. Lambeth, F/L
Stn Winnipeg

(Touché! A good point. The hand and watchband referred to, belong to a non-flying type. It is hoped that personnel even remotely connected with aircraft are aware of the hazards involved in wearing these items.—ED.)

HIGH, AND HOT TAKEOFFS, JET

It is possible to get airborne under extremely hot conditions, but on the wrong side of the power curve. This puts the aircraft in a precarious position, one in which an accident is almost certain to occur. Here are a few thumb rules for jet takeoffs:

- Figure on a 4% to 5% loss of thrust per 10° F rise in ambient air temperature above sea level standard.
- Allow for a 2% to 3% loss in thrust per 1000 feet of elevation above sea level.
- For each 10° F of ambient air temperature above sea level standard of 60° F, increase takeoff rolling distance by 10%.

For each 1000 feet of elevation increase your takeoff rolling distance by 10%.

USN: Approach

FLIGHT COMMENT

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