

The **ROUNDDEL**

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ROYAL CANADIAN AIR FORCE

The ROUNDDEL

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This Month's Cover



A CF-100 makes a rocket-assisted take-off from R.C.A.F. Station Uplands.

Sgt. Shatterproof is Ready

Sir:

In times such as these we must be tolerant of impatience in those upon whose shoulders the destinies of millions rest. I trust, therefore, that you have not been unduly upset by the frequent telephone calls which you have doubtless been receiving from Mr. St. Laurent, Mr. Churchill, Mr. Truman, and Mr. Stalin. It is, after all, only natural that they should be agog to learn what stand I propose to take if and when a Flying Saucer makes its first official landing. There is, however, no immediate cause for alarm. Intensive study of the "Science Fiction Quarterly", "Amazing Stories", "Weird Tales", and other authoritative organs of galactic thought, has satisfied me that we need not anticipate any formal deputation from Outer Space for a while yet. Until then let our leaders relax, secure in the knowledge that Shatterproof is now prepared either to face the disintegrators or to clasp the outstretched tentacles of whatever interstellar spokesmen may set their pseudopods upon this planet.

At this point I see you shake your head. "Can it be," you murmur, "that the old wardog intends to match his 240 pounds of bone and muscle against the super-weapons of a vastly older civilization?" Let me hasten to assure you, Sir, that it cannot. Even the Shatterproof pelvis-lock — the hold that served me so well during my youthful tenure of office as hatchet-man in the Boilerhouse Thugs — would avail little against the amoeboid panzer troops of Procyon III or the tri-sexual fungus-men of Phobos. No, I propose to employ no weapon more devastating than the honey-tongued rhetoric which, as you are already aware, once earned for me the title of "The Demosthenes of Medicine Hat."

To that end I have prepared an Address, to be delivered by myself to our extra-terrestrial visitors.

Brief, soldierly, and to the point — yet at the same time pregnant with diplomacy — it should induce a spirit of camaraderie even in the most unbending methane-breather that ever sauced Earthward from the jungles of Jupiter.

* * *

Gentlemen — if, without offence, I may call you such:

I have been chosen to represent my race for two reasons. First, because we Shatterproofs have ever been in the forefront of public life; and second, because one who has spent more than a quarter of a century in navigating the troubled seas of R.C.A.F. policy is not likely to lose his way in the relatively clear-cut channels of trans-spatial intercourse. In the name of homo sapiens, gentlemen, I welcome you to Sol III.

I am not going to speak to you about the world on which you now find yourselves. Your long-



range scanners have already familiarized you with the life, both public and private, of its inhabitants. By the former you have probably been shocked, by the latter almost certainly embarrassed. Do not, however, judge us too hastily. We are a young race. It is, indeed, but a scant 300,000 years since Eoshatterproof Erectus, the founder of my own family, was being bulldozed across the Precambrian Shield by the advancing glaciers of the Ice Age. It speaks well for us, I think, that so few years have sufficed for that bellowing child of nature to evolve into the suave Citizen of the Universe who now stands before you.

Frankly, we do not yet know the purpose of your visit. But, gentlemen, as I look into your many-faceted eyes, I am aware that they are informed only with benignity. We have still to learn in what way that benignity will manifest itself towards us.

For my own part, I do not share the popular view — or shall I say the unpopular view? — that you propose to add to the charm of the universe by liquidating mankind. Why, I ask myself, should you expend your energies on something which we are quite capable of doing ourselves? Obviously, too, you do not wish to trade with us. Few of our artifacts are adapted to a physiological economy such as yours. Ten legs, gentlemen, can never be housed in one pair of our trousers, nor is a Bendix washer the ideal cleansing-mechanism for the asbestos underwear of a polyped from the twilight zone of Mercury. I can only conclude, therefore, that you desire nothing more than to instruct us in the basic principles of planetary management.

If I am correct in this belief—and a Shatterproof is seldom wrong — one fact stands forth pre-eminently clear. You cannot effectively achieve your aim without the co-operation of indigenous advisers of high intellectual and moral calibre — men of versatile genius, men who are ready, if called upon, to sacrifice themselves on the altar of their cosmic duty. Since the day of my retirement from the R.C.A.F. is not very far away, may I, gentlemen, be the first such man to step forward and offer you my services?

The terms of my engagement can be discussed later. With us Shatterproofs, it is the task that matters, not the reward. But I would suggest



(purely for the sake of establishing a sound precedent) that my twice-held rank of W.O.2, or its equivalent in your organization, be restored to me with full seniority, and that the provisions of Part IV of the Pensions Act be studied and observed by your Accounts Branch.

And now, gentlemen, my part in the first act of this historic drama is played. The ears of the world await your answer.

* * *

And there, Sir, you have it. Any beings capable of crossing space on a saucer will instantly recognize the advantage of recruiting a man of my experience, and — unless we have to deal with the vermiform matriarchy of 61 Cygni VI — I feel quite safe in guaranteeing your readers a rosy future under the new régime. In conclusion, I would add that I can hazard no guess as to when the foregoing Address is likely to be delivered, for I myself have yet to see a Flying Saucer. None the less, it will bring comfort to many to realize that, should the need arise, Shatterproof is both able and ready to step into his cosmic rôle.



AN AIRWOMAN IN JAPAN

By Cpl. Darrell Eagles, R.C.A.F. Station Lachine

("While in Tokyo on photographic duties," writes the authoress of this little sketch, "I ran into my old friend Pauline Asano, of R.C.A.F. Station St. Hubert. During the days that followed we saw a fair amount of each other, and I was much interested in Pauline's account of her trip and of her reactions, as a Japanese Canadian, to the land of her forefathers. I am sending you this 'second-hand' report of her impressions, as well as a few photographs that I took of my photogenic friend as she explored the city, in the belief that they may be of some slight interest to your readers."— EDITOR.)

Airwoman in kimona.



WITH HER ROOM-MATES' "goodbyes" and their clamorous reminders about souvenirs still echoing in her ears, Airwoman Pauline Asano climbed into the transport that was to take her from St. Hubert to Dorval, on the first leg of her visit to Japan. During the long ride across Montreal, she looked back down the chain of events that had led to this, the most exciting moment of her 22 years of life . . .

Shortly before the war her mother and sister had returned to Japan to visit relatives. Japan's sudden entry into the conflict trapped them there, and Pauline, her father, and her brother were left alone in Western Canada — whence, like a lot of other Japanese Canadians, they were forced to move east.

In August last year, Pauline enlisted in the R.C.A.F., and, on the conclusion of her fighter control operator's course at Clinton, was posted to St. Hubert. Here it was, a month ago, that she had received news that her mother was seriously ill. Hopefully, she submitted a memorandum "through the proper channels," requesting passage



Pauline goes sight-seeing with Cpl. H. Schleger, of No. 426 Sqn.

to land that night at the U.S.A.F.'s Base at McChord Field, Washington.

"At McChord", said Pauline, "many people were curious about my uniform. They asked me all kinds of questions. How did I like the Service? What did I think of flying? Where was I going? They were quite impressed when I told them 'Japan'. The U.S.A.F. girls were very nice to me. They entertained me royally. We went on picnics to Mt. Rainier, and I was shown all the sights there worth seeing. I really enjoyed myself."

Two days of this, and Pauline took off for Anchorage, Alaska. There they were forced to spend the night at Elmendorf Air Force Base, because of weather conditions at Shemya, in the Aleutians. Shemya, where she landed the next day, impressed Pauline not at all. "I've never seen such a bleak-looking place in all my life," she informed me. "No trees, and the grass all yellow and faded. As for the weather, 'changeable' isn't the word for it. Apparently the Pacific Ocean and the Bering

Pauline gives her forwarding address to a street photographer.

to Tokyo on one of No. 426 Squadron's aircraft engaged in the Korean Airlift. Red tape unwound; and at last, to her almost incredulous delight, she received word that her application had been approved. Then came the business of hurried packing — complicated by visits from newspaper reporters and the eager help of the girls in the barracks, who were almost as excited as she herself. And now . . .

The transport rolled to a stop outside No. 426 Squadron's hangars. While her baggage was being checked, Flying Officer Mildon, the adjutant, helped her with her last-minute arrangements and put into her hands a bundle of morning papers that carried stories about her. "These," she said, as she told me about it all later, "I forced myself to read. I found it helped to ground the butterflies that were flying around in my stomach."

Once in the air, however, she felt much better. It was not her first flight, but flying was still a fairly new and thrilling experience. All day long the North Star winged its way across the continent,



Sea meet there — though I can't imagine why they'd choose such a spot as *that* to meet in."

But Shemya was soon forgotten as the North Star droned along on the final lap of its journey. As Pauline looked down on the neat fields of Japan, and as her impatience to see her mother increased, she found herself wondering how she would react to the differences between Canada and the ancient land she was about to visit.

An invitation from the captain of the aircraft to "come up front" interrupted her thoughts. After she had looked things over for awhile, the radio operator asked her if she'd like to hear some Russian Dixieland music. She put on the earphones, and presently the music was replaced by the sound of a voice speaking a language she had never heard before. "Russian?" She raised her brows at the operator, who nodded. Later he explained that the Russians jam the air with such programmes in order to confuse any foreign aircraft flying in the area. Pauline considered that rather childish.

"At last," she said, "the 'Fasten Belts' sign flashed on, and through the clouds I saw Tokyo. It looked awfully big. We landed — and then something happened that I shall never forget.

"My mother lives in the village of Sojacho, quite a long way from Tokyo. Before I'd had time to get a railroad ticket, however, the crew of the aircraft had chipped in and bought me a Japanese airline ticket to Osaka, which is quite close to Sojacho. I was so happy and overwhelmed that I could hardly say 'thank you'.

"It was about six o'clock in the evening when I arrived at my mother's home. No one knew I was coming, so I didn't know what to expect. My sister, who is twenty, looked up and saw me standing in the doorway. She called out to my mother, who was lying down resting, and then ran towards me. She threw her arms around me, saying my name over and over again. Then I heard my mother's voice from inside. I removed my shoes, as is the custom before entering the house, and hurried in to her. She, too, kept repeating my name as if she couldn't believe that I was there in her arms. By this time, we were all



At a roadside gift-shop.

crying and laughing, and I don't think we knew what we were doing.

"Meanwhile, several of the neighbours had gathered outside, wondering what the celebration was about. Afterwards, they told me they had guessed it was me, because of the family resemblance. When, presently, I sat down cross-legged on a pillow to eat supper, I had embarked upon a new way of life that was to last for the next few weeks."

During those next few weeks Pauline often felt like an information bureau. The neighbours were continually plying her with questions about Canada — as well as with the inevitable inquiries about Service life and flying. The younger people were all curious to know if Canada was as rich and prosperous as they had heard, and they seemed to think it would be a great privilege to live in such a fine country — a country that had not been ravaged by war. They all felt that it was ever so much better to have the Allies in Japan than the Russians. The girls, of course, wanted to know what kind of clothes Pauline wore in



The Japanese traffic policeman is an artist.

Canada, and she had to describe them in meticulous detail.

She was greatly surprised to find that, in the country and small villages, marriages are still arranged by the parents. The boy and girl concerned meet each other a couple of times and have long conversations so that each may get an idea of what the other is like. If there appear to be no serious differences, the marriage is arranged. In the cities, however, the courting procedure is much the same as in Canada.

Pauline showed me a kimona that her mother had made for her.

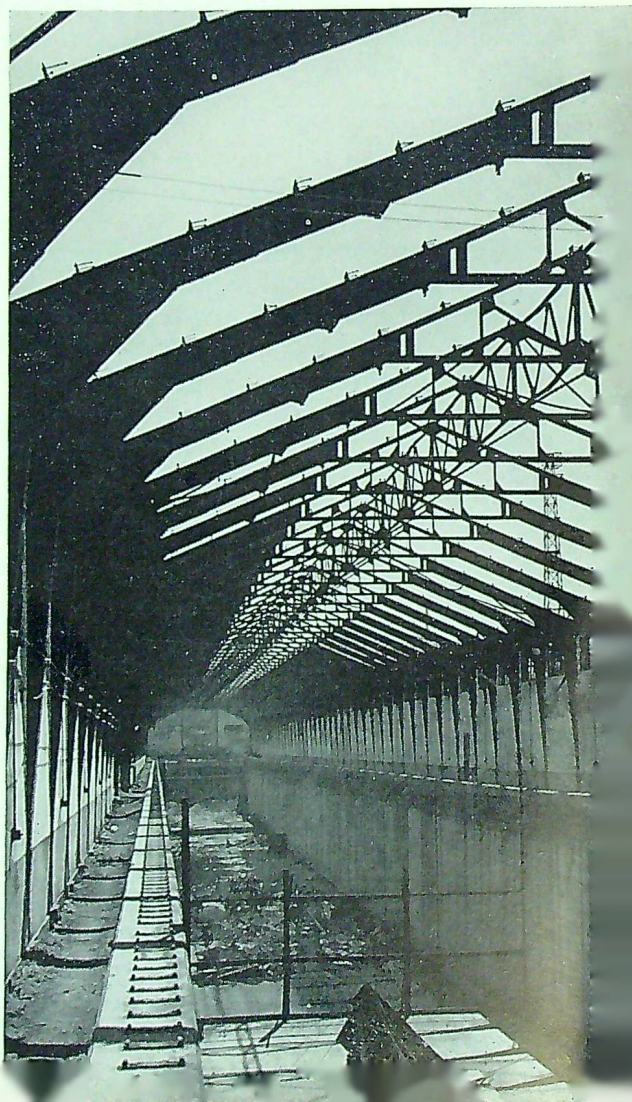
"Isn't it beautiful?" she asked, as she modelled it. "It's made out of pre-war material, and to-day it would be prohibitively expensive. A kimona," she added, "is a little uncomfortable until you get used to it. You're supposed to wear the sash very tight. The shoes, too, are awkward at first. I have to take small dainty steps or else they come off."

When she was not with her family, shopping and sight-seeing took up most of her time. Her ability to speak Japanese, of course, helped her considerably in getting around. She visited Hiroshima, Yokohama and the Dai Butsu shrine; and she also went to Kure, where a large number of Canadian Army boys were stationed. Pauline was the cynosure of all eyes, being the first Canadian girl ever seen in the camp. Her Japanese

appearance really had them guessing — until they noticed the Canada badge on her uniform. At first they mistook her for a Red Cross girl or a Japanese airline hostess. While at Kure, she stayed at the Australian Women's Medical Corps quarters.

Shortly before she returned, she again saw her girl-friend, Sachiko Ikeda, to whom she had said "good-bye" before the war, when the former had returned to Japan with her family. Sachiko had seen an item in the "Nippon Times", a Tokyo newspaper, mentioning Pauline's visit to her

A reminder. A war-time testing-tank for underwater missiles.





A city of contrasts.

mother. She had immediately come down from Yokohama, where she works as a stenographer in the Bank of America, to visit her.

"When eventually the time came for me to leave Sojacho," said Pauline, "my family came down to the train to see me off. It was a rather sad parting. I wished so much that I could take them back with me. But, as the train pulled out, my sadness was a little alleviated by the thought

that I was on my way back to Canada. Now that the Peace Treaty is signed, I hope that my mother and sister will soon be able to join me and that we shall be able to take up life together again where we left off eleven years ago."

"Meanwhile," says Pauline, "I am grateful beyond words to the people who made my trip possible and to all those who were so kind and helpful to me en route."

It's in the Wind

3. Rain

By R. A. Hornstein

(Reprinted by courtesy of the Dept. of Transport)

*The rain, it raineth every day
Upon the just and unjust feller,
But mostly on the just, because
The unjust hath the just's umbrella.*

ALTHOUGH UNDER most conditions rain is not one of Nature's dangerous phenomena, it does perhaps cause more minor inconveniences than any other weather element. Naturally, then, quite a store of proverbs, designed to aid in the foretelling of rain, has come down through the years. As is always the case with a collection of weather proverbs, in some there is considerable wisdom, in others a smattering of reason, in still others completely unfounded superstition.

One saying frequently heard is: "Rain before seven, clear before eleven." That particular proverb certainly could not have originated in Canada. Many have been the times when we have awakened to a rainy day, watched the rain pour down all day long and gone to bed again with the skies still dripping. It is obvious, then, that this saying is not entirely true. As a matter of fact, even if we rule out the extreme cases as the exceptions which are supposed to prove the rule, there are still plenty more when rain which began before seven is still going on after midday.

However, for the saying ever to have been thought up, there must have been at least a glimmer of reason behind it. The following explanation may account for it.

When an area of widespread rain arrives in advance of a low pressure area, there is a fairly definite period of time between the first arrival of the rain and its eventual departure. The actual time interval varies over wide limits, of course, but a study which has been made of rains in Eastern Canada indicates that the average rain period is of the order of eight hours.

Hence, if the rain began four hours before seven in the morning, there is an excellent chance that it will be all over by eleven.

As already indicated, however, this is by no means a sure thing and this particular proverb may be classed among the poorer ones. Of course, there is always a way out of a difficult situation if you ever quote this proverb and then have the rain carry on throughout the afternoon. After all, you simply say, "Clear before eleven," and you do not specify whether it is eleven o'clock this morning or eleven o'clock this evening, or even eleven o'clock tomorrow morning!

There is another well-known rain saying which has considerable truth in it. It is often quoted in the form of a rhyme:

*"When the ditch and the pond offend the nose
Then look for rain and stormy blows."*

We have all met people whose sensitive noses are able to “smell” a rain coming. People living near a stagnant pond or a ditch or an undrained swamp know how grasses and weeds decay in those locations. In the process of decay, much foul-smelling gas is produced, and it accumulates in bubbles and pockets under the mud. Storms, of course, are low pressure areas. Therefore, an approaching storm is preceded by a considerable decrease of atmospheric pressure, as is well-known to folks who have weather-glasses. The barometric readings can be seen to fall at the approach of a storm.

This fall in pressure, of course, lessens the pressure on the putrid gases imprisoned in and under the mud. As a result, the gas is able to expand, break loose, and come to the surface in greater and greater quantities. Occasionally the concentration of these bad-smelling gases will be enough to give the local atmosphere a definitely offensive odour. Then, as Shakespeare put it so well, there is “a very ancient and fish-like smell”, and in most cases it will be found that the forecast of rain is well justified.

Actually, as has just been pointed out in connection with odours, there are some good signs of rain, but there are very few weather signs to be seen in the rain itself. Perhaps this is the best:

*“Rain long foretold, long last—
Short notice, soon past.”*

This really means that, if the clouds have moved in slowly and thickened gradually over a period of a day or two, it is quite probable that the resulting rain will be equally persistent; but if the clouds have gathered rapidly there may be only a passing shower. The gradual increase of cloudiness over a day or two is typical of the approach of a slowly-moving disturbance or a widespread storm in which the rain usually lasts several hours. Thus, there is justification of the part of the proverb which says:

“Rain long foretold, long last.”

On the other hand, the rapid gathering of rain clouds indicates quick action, such as that of a thunder-shower or a squall which are often storms



of small extent and, therefore, of short duration. Hence “Short notice, soon past.”

Still another well-known rain proverb says:

*“Sunshine and shower,
Rain again to-morrow.”*

Obviously, “Sunshine and shower” generally imply rain from a cloud of very limited extent, and rain from so small a cloud in turn means that the air has a distribution of temperature and moisture which is favourable to the formation of a succession of such clouds. Hence, as such conditions may persist from one to several days, sunshine and shower on one day may well be followed by showers the next day. However a completely new mass of air could arrive during the night, or there might be an overnight change in the character of the air mass already present. Such changes might well remove all chance of shower on the morrow and thus prove the saying false.

Is Fighter Design in a Rut?

By Wing Commander A. U. Houle, D.F.C.

(The author of this article joined the R.C.A.F. in 1940. Trained in Canada as a pilot, he completed his operational training in England, and was sent with a group of other pilots to fly Hurricanes to Malta from the deck of H.M.S. "Ark Royal". After this, he served in Egypt with Nos. 145 and 213 Squadrons of the R.A.F., and later as C.O. of No. 417 (R.C.A.F.) Squadron in Malta, Sicily, and Italy. He was wounded in Italy at the beginning of 1944, and returned to Canada to take up the duties of O.C. the air-firing squadron at No. 1 O.T.U., Bagotville. Subsequently posted to A.F.H.Q., he served in the Engineering Branch for a time before proceeding to Michigan University where he obtained his degree of M.Sc. He is now Chief Project Engineer at the Central Experimental and Proving Establishment, R.C.A.F. Station Rockcliffe — and is thus well qualified to express his views even though they do not necessarily reflect the official opinions of his Service.—EDITOR.)

The Realistic Approach

Fighters such as the CF-100 and F-86 are being designed and built in large numbers for the Air Force. These are no peacetime playthings; so presumably they are bought either as deterrents to another war or as front-line fighters to be used should that war actually break out. Whichever purpose they are expected to fulfill, however, let us consider whether they — or any other types of modern fighter — are really being designed in a manner calculated to give the highest ratio of enemy losses to our own.

* * *

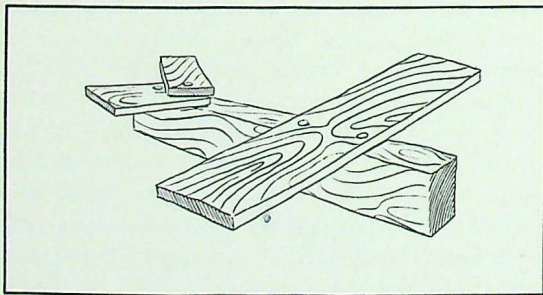
There is a strong tendency nowadays to design aircraft and to include additional equipment for

the sole purpose of cutting down peacetime losses. This springs from a notion that the public will howl at losses in peacetime but will accept anything in time of war. The notion is a mistaken one: the public will accept facts. The additional equipment is put there to protect clots. The performance of the aircraft suffers; and ten, maybe more, conscientious and wide-awake men are lost in combat for every incompetent who is saved during training.

How often do operational requirements personnel and design engineers figure out the cost in an aircraft's performance — and therefore the added risk — as opposed to the possible safety factor that added equipment will give? Psychologists and doctors point out that roomy cockpits and other comforts cut down on pilot fatigue. Though this is true in pleasure-flying, a fighter pilot on operations could not relax even if he were able to stretch out in an easy chair. He can afford to get very tired and uncomfortable if gracious living in the cockpit is going to bring bullets round his head instead of additions to the number of his kills. Therefore, unless the added equipment will result in an *all-round* saving — leave it out.

Once an aircraft is built it is difficult to calculate the effect of an additional ten, or even hundred, pounds of weight; and the tendency is to say

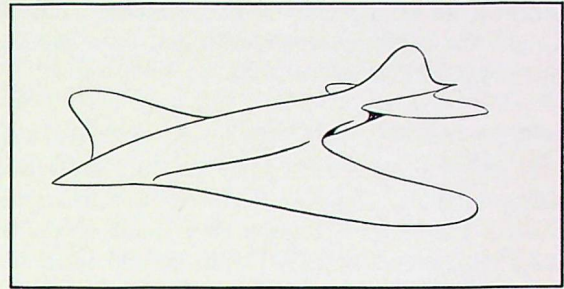
THE MAINTENANCE OFFICER'S ideal fighter.



“put it in”. But, as Mr. E. H. Heinemann, chief engineer of the Douglas Aircraft Company, has pointed out: “In the design of a current new model, if a 100-lb. item of equipment is added, and the performance and strength are maintained, the gross weight will increase — not 100 lbs.— but by a factor of 10, or a total of 1000 lbs.” Thus the weight adds up rapidly and can relegate an otherwise good aircraft to one that is only moderate or even dangerous in the face of the enemy. The following paragraphs outline a few specific instances where it is considered that there is considerable room for improved thinking. They do not pretend to be exhaustive, nor may they in all cases be legitimate criticisms; but they are worth investigating.

Engine Starters

Engine starters for jets are contributing far too much to the weight of the aircraft. Even if the cart-ridge starters now becoming available weigh much less than electrical starters, we must consider the additional weight which is added in making the installation. Airborne starters usually add more than a hundred pounds to the aircraft and are only used when the 'plane is on the ground. Doesn't this seem a bit ridiculous? Surely a little more thought could produce a mechanical or electrical ground starter to be fitted on the compressor end of the shaft. Another possibility is the use of compressed air. Possibly design along these lines is in progress, but the fact remains that our present fighters have been built with the old-time starters. This can only be attributed to lethargy or to disinterest in the welfare of those who fly our fighters in a possible next war. It is to be hoped that the problem and cost of supplying such starters at all bases is not used as an excuse. Such an excuse would be palpably absurd in view (quite apart from lost aircraft and lives in war) of the cost per ton-mile of carting extra weight through the air, the cost of present ground and air starters, and the added cost of the structural materials which must be built into the aircraft components to maintain strength and performance.



THE DEVELOPMENT OFFICER'S ideal fighter.

Radio Aids

Radio aids to navigation present a more ticklish question. Useful though they are in peacetime to aid us in flying from point to point, our next enemy may not play ball and provide radio beacons over his territory in time of war. He may, indeed, not even allow us to use our own. There is a strong possibility that fighters in front-line areas will be completely directed by ground radar. Possibly the weight of a radio compass in a fighter is justified, but its use in training should be restricted (by a seal which may be broken if necessary) in order to accustom pilots to navigating without its help. Other navigational aids must receive even more critical consideration.

Automatic Temperature Control

Automatic temperature control for cockpits, and the inclusion of temperature gauges on an already full instrument panel, indicate how easy it is to lapse into a somnolent state as far as unnecessary equipment is concerned. Though not much may be added in terms of weight, life is made more complicated both for the pilot and the servicing crews. Is automatic temperature control necessary at all? Does the Air Force select pilots who don't know when they are hot or cold or who are unable to open a simple manual valve? Does a pilot care what the exact temperature is so long as he is neither too hot nor too cold? The optimum temperature will vary according to the amount of flying clothing the pilot wears, his physical condition, and the amount of

exertion he puts forth, so that he will have to adjust the thermostat anyway. Let us minimize the gadgetry and weight.

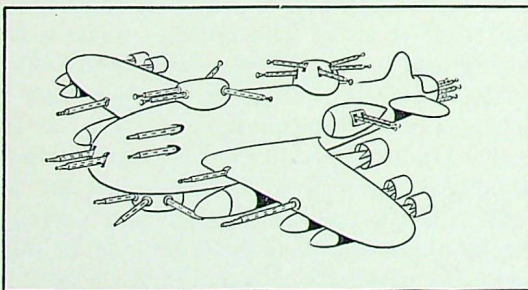
Emergency Units

More and more emergency or dual units are being added. Rigid equipment specifications control the weight of units to a point at which their reliability is impaired and a second one must be installed as a safety factor against emergencies. One specific case is the emergency fuel pump and regulator installed in some jet aircraft. It would be interesting to get statistics on the number of times it has actually been required as compared with the accidents *caused* by inadvertently leaving it on — especially when an overshoot makes it necessary to “go round again.” All it really accomplishes — let’s face it — is the addition of weight and needless complication.

Armament

Have we forced armament design to keep pace with aircraft performance, or does the weight of guns just keep on going up as the square of the bore? Are we not making a fetish of gun life and reloading time, as evidenced by gun packages, and forgetting all about weight? Pare the size and weight down, even if guns only last for 1000 rounds, and the aircraft that are saved could be standing by already refueled and rearmed for the next sortie. It is easier to put in new guns than to provide a new aircraft. Statistics on the average life of a fighter aircraft in front-line operations during the Second World War might give a

THE ARMAMENT OFFICER'S ideal fighter.



target at which to aim. The heaviest and best guns in the world are no good unless the mother aircraft has performance to match the enemy's.

Nose-Wheel Steering and Anti-Skid Brakes

Two good examples of *sound* design are provided by nose-wheel steering and anti-skid brakes. Nose-wheel steering need only save five to ten gallons of the fuel normally required for taxiing in order to offset all the additional weight of the steering equipment. The ease and speed of getting into position seems to make it well worth while; and further, in the event of brake failure, the pilot can still manoeuvre to avoid hitting obstacles. Non-skid brakes add little to the weight, but they cut down materially on the landing-run and resultant wear of tires. Aerodrome lengths and type of surface are restricting the ability of jet aircraft to operate closely behind an advancing army. Non-skid brakes will add to the fighter's adaptability.

A Place for the Piston-Engine

The subject of army support leads us to the consideration of another aspect of aircraft design, namely, the use of slower and more economical reciprocating-engine aircraft for strafing and fighter-bombing. Have we allowed our enthusiasm for our new toy, the jet, to blind us to the advantages of aircraft such as the Spitfire or Mustang for this type of work? It is fatal, in a real war against a well-equipped enemy, to try to strafe at a height of more than fifty feet, and it is quite impossible to do a good job of spotting a target, changing course on to it, and hitting it, at speeds much greater than two hundred knots. (Even at low speeds, strafing takes a lot of practice. During the war, many pilots were killed on operations of this kind as a result of a training policy that forbade practising below three hundred feet — another instance of how easy it is to lose ten in war for every one saved in training.) The speed of the jet makes it unsuitable for strafing, and its initial cost and fuel consumption make it most expensive. Though operations of this kind are unquestionably more dangerous (as far as

ground fire is concerned) when carried out at low speeds, let us not forget the number of extra passes or sorties which have to be made at higher speeds in order to knock out an equal number of well-dispersed targets.

Structural Strength

At the risk of being called a heretic, I would suggest that our structural strength requirements be examined and possibly relaxed. We are now designing fighters with a limit load factor of more than seven and an ultimate of 11g. The advent of the anti-g suit has had a tendency to push the figures up and up, because a pilot can now stand more. But the added weight penalty has made it difficult for the present-day fighter to get above 40,000 ft.—and it takes a lot longer. At such altitudes it is impossible to pull more than 2g without falling out of the sky. This being so, why on earth do we not design to a normal load factor of 4 or 5 and an ultimate of 6 or $7\frac{1}{2}$ g?

Pressurized Cockpits

During the Second World War, aircraft cockpits were pressurized to allow pilots to reach the high altitudes necessary to shoot down the enemy's reconnaissance aircraft. Have we gone on blindly from there? The weight penalty for structure and blower is high and the vulnerable area is excessive. It is also difficult, because of the leak-rate, to maintain sufficient pressure at high altitudes. An expenditure of a few million dollars at the most should be sufficient to develop a suit for the pilot

which would be a combined air-conditioned pressure-suit and anti-g suit. The pilot would still be pressurized for high-altitude bale-out and have protection from the cold for his fall. Without pressure-suits, a bullet-hole or the failure of a canopy seal limits the physiological ceiling for the pilot of a high-speed aircraft to 44,000 feet, because the cockpit pressure falls far below ambient pressure for the altitude at which the aircraft is flying.

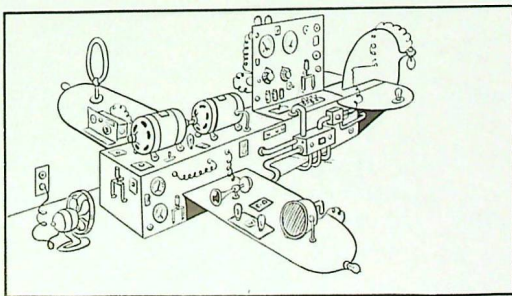
Other Considerations

In concluding my complaints, let me reiterate my conviction that in attempting to solve our problems we are too often becoming exuberant over peacetime stop-gaps that will penalize us in the event of war. It sounds good to say that we have aircraft with the greatest rate of roll — some 270 degrees per second, with our next objective 540 degrees per second. The requirement for a high rate of roll is a figment of an unrealistic imagination, and it plays little part in any type of aerial fighting. Aircraft now in production actually have too high a rate of roll for even the best of pilots to maintain sufficient orientation.

And have we, by putting a crash-helmet on the pilot, really solved the problem of preventing him from conking his head? — or have we at the same time provided him with blinkers such as were formerly used to prevent horses from looking backwards? In the next war it will be just as necessary for a pilot to see beyond his tail as it was in the last.

Again, during the last war the engineers decided to put weights in the Spitfire control system because some goof tried to show how strong he was, reefed back on the stick, and tore the wings off. The extra weight hampered the pilot and seriously slowed down manoeuvres in the looping plane; and although there was an order against it, the weights were tossed away. How long can a country go on winning wars in spite of all this sort of thinking?

THE TELECOM. OFFICER'S ideal fighter.



The Ideal Fighter

The ideal fighter would have unlimited altitude, speed, rate of climb, range, armament, comfort,

strength, safety, and minimum take-off and landing run, fuel consumption, size, weight, and cost. Unfortunately, the requirements conflict with each other, and it is much easier to criticize than to arrive at the ultimate in compromise. We can't, however, get even close to it if we blind ourselves to the fact that compromises have to be made. Personnel who are in the Service today may not fight the next war, but it is their duty to pass on the best possible tools and knowledge to the men who will fight it for them.

Every department concerned with the design of an aircraft wants perfection for his particular baby. Therefore someone must be appointed as

umpire. Without such an umpire, we shall have complicated and weighty fighters. Too many safety factors can become dangerous. Every suggested component of a fighter must be examined super-critically, and rejected unless absolutely essential. It should be easy to reduce the weight of a fighter, while maintaining the same load and ammunition, from 14,000 lbs. to 12,000 lbs. The rate of climb will be increased approximately 35 per cent by the 2,000 lbs. saved — and 95 per cent for 4000 lbs. Furthermore, while the wing loading will remain the same, every other aspect of performance will be improved.

Surely this is worth striving for?

TARZAN TARZANOVITCH

"Placing his foot upon the body of his kill, he uttered the reverberating cry of the bull ape." It was thus, if childhood memories are not at fault, that Tarzan was wont to signalize the successive proofs of his prowess. It struck one at the time as slightly ostentatious, but one realized that Tarzan knew no better and after all he generally had done something pretty good, like turning an alligator inside out or throwing a buffalo over a cliff. But of all his feats none is better worth reverberating over than his latest; he has got past the Iron Curtain. It is true that Russian audiences are not being allowed to swallow him neat; the films in which he appears are preceded by a foreword which explains that "Tarzan is the child of a rich Englishman, raised in innocence by the jungle apes," and that "he never encountered the corrupting influence of bourgeois culture till he met American explorers."

(*"The Times Weekly Review"*: U.K.)



(Whenever a vital and controversial issue is at stake in any large organization, sooner or later a decision must be made. It should be made only after every aspect of the problem has been studied: but once made — i.e. once it has become “policy” — it must be supported by all whom it affects. Otherwise, chaos will result.

This does not mean that the dissentient voice is to remain silent. Without dissentient voices there can be no true progress. At the same time, however, the work in hand must be carried on according to whatever plans have satisfied the senior executives as being the best yet evolved. Change or modification will surely follow should they subsequently become convinced that other plans are even better.

The present article is the first in a series of articles designed to explain to our readers why certain major policies have been adopted by the R.C.A.F. It is hoped that they will stimulate thought both in and out of the Service, and that they will also evoke that informed criticism, whether favourable or adverse, by which all planning is eventually shaped.— EDITOR.)

FILE ANALYSIS: AFHQ S60-3-63 THE AVRO CF-100

By Wing Commander H. R. Footitt, Director of Development “A”, A.F.H.Q.

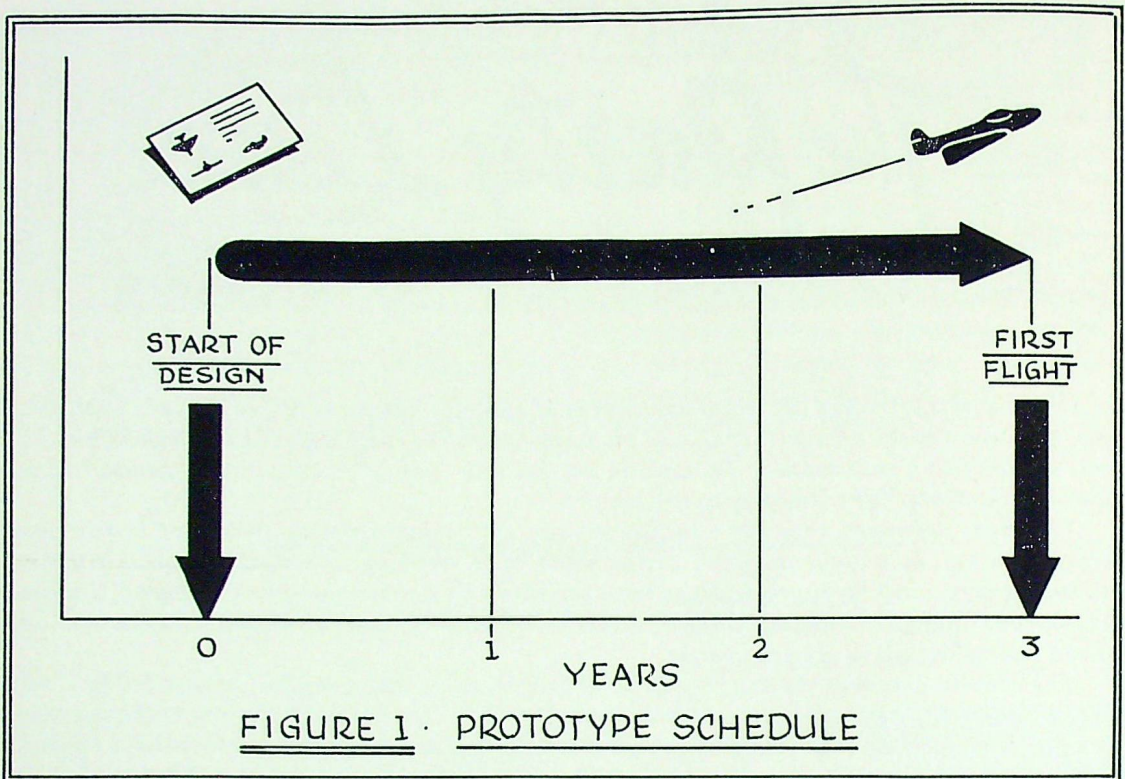
“In the present-day thinker’s attitude towards what is called mechanical progress, we are conscious of a changed spirit. Admiration is tempered by criticism; complacency has given way to doubt; doubt is passing into alarm. There is a sense of perplexity and frustration . . . ”

(Sir Alfred Ewing, President of the British Association for the Advancement of Science, 1932)

If this lament had been poured forth by LAC Jetwhine or Group Captain Propclatter in 1952, and directed towards the Avro CF-100 fighter, no one would be surprised. For the years of waiting for the oft-headlined “super-fighter”

have taken their toll of patient spirits. Even the man on the street is puzzled: “What’s holding up production of these CF-100’s?” “Is it going to be obsolete before it’s delivered in quantity?” “In view of the delay, is the project worth while?” And, indeed, when one considers that the CF-100 started on the drawing boards in late 1946, first flew in January 1950, and is only just now coming into service in the R.C.A.F., one’s first impression of the picture is apt to be a bit gloomy.

In point of fact, however, that first impression is very wrong. Let us open A.F.H.Q. File S60-3-63, “Avro CF-100,” and make a searching analysis of



its contents. We shall then realize, I think, that our depression arose, not from the picture, but from the light in which we were viewing it.

* * *

First, it must be appreciated that the all-weather fighter of to-day is a far cry from the 10,000-lb. Mustang and Spitfire of the Second World War. These small day-fighters could be rolled out of the factory for a mere \$50,000 each. The CF-100, on the other hand, is a big aeroplane. Fully loaded, it weighs about half as much as a North Star — 34,000 lb. with all internal fuel tanks filled, and almost 40,000 lb. with tip tanks. and it will cost in production about as much as the R.C.A.F. originally paid for North Stars.

The increased cost is tied in with increased complexity. The modern all-weather fighter is a maze of radar scopes and scanner, intricate radio

and navigation aids, precise instruments and armament sight, air conditioning and cockpit pressurization equipment, ejection seats and other safety features. These, along with the aircraft structure, cost 450,000 man-hours of design for the CF-100, compared with 42,000 man-hours for the Mustang. A major part of this CF-100 time was charged to scheming out the 10,000 original drawings required for the shop. At the present pre-production stage, when design changes and service modifications are pouring in, drawing alterations are streaming through the blueprint room at the rate of 300 a week. This is normal for any aircraft of comparable complexity at an equivalent stage of production.

Such design complexity has led British and U.S. authorities to agree that it takes about 3 years from the start of the design to the first flight of the prototype (Figure 1), and 1½ to 2 years from the

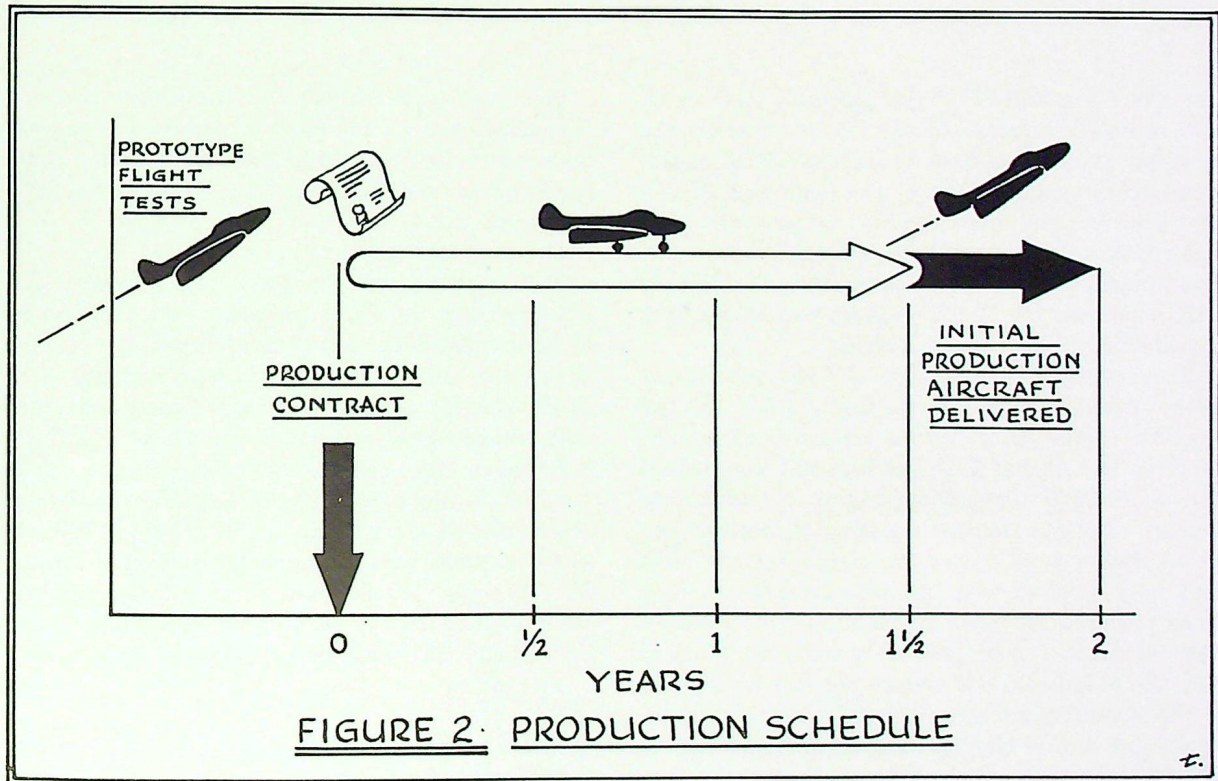
negotiation of the production contract to initial production of aeroplanes (Figure 2). These times cannot be appreciably shortened, for, as production expert William S. Knudsen once said, "You cannot hatch eggs in less than 21 days, no matter how many hens you put on them."

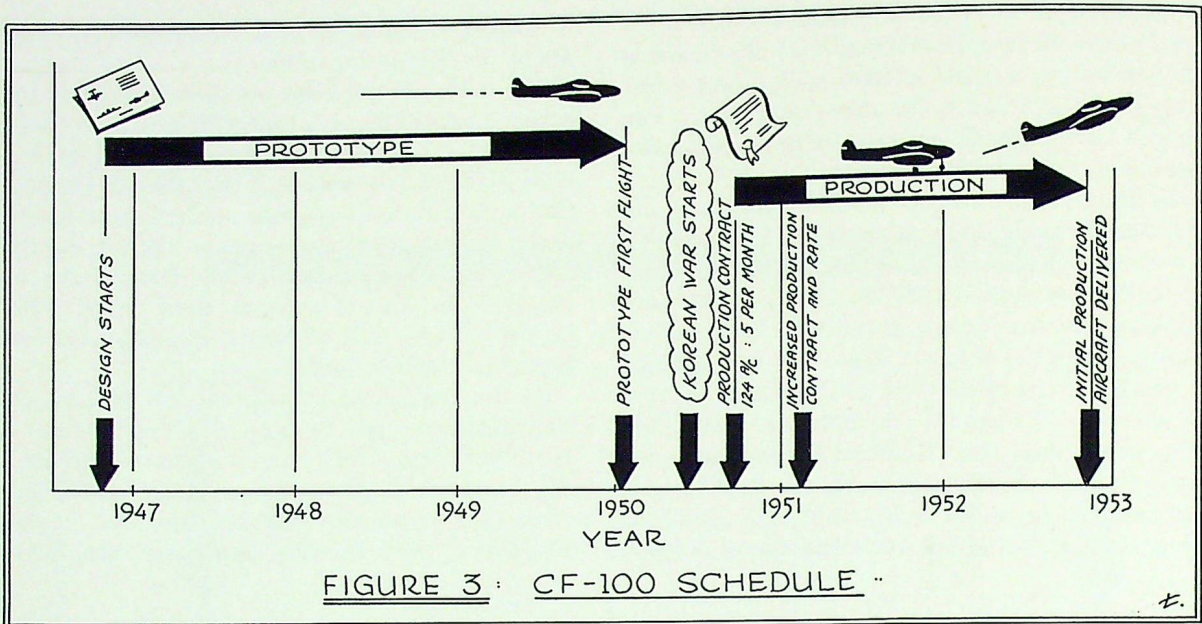
In June 1950, when the Korean War flared into the headlines, only one aircraft of the twelve CF-100's on order was on preliminary flight trials. In early September 1950 the U.N. forces were clinging to the Pusan perimeter. The war in Korea was obviously no flash fire, and defence sights had to be raised: 124 CF-100's were ordered at a rate of 5 a month. By February 1951, only 1½ years ago, the Chinese Communists had surged across the Yalu. A world war now hung in the balance. Again the sights had to be raised, and both the number of CF-100's and the production

rate were increased by several hundred per cent above the September order.

These significant facts are plotted against the actual time in Figure 3. Using the first production contract as a base line, and comparing Figure 3 with Figure 2, it is apparent that CF-100 production is hitting the high side of the 2-year period allowed from contract to initial aircraft off the line. Probably the prime reason for this can be summed up in the modern term "production facility." Avro had to create their aircraft and engine production facility.

Arthur Raymond, Vice-President of Douglas has remarked that "it is often easier to build a prototype than it is to put it into production." The truth of these words is reflected in the fact that the production CF-100 requires 15,000 templates, 7,000 forming tools and dies, 3,000





machine tools, and 125 major assembly jigs (which will probably increase to several hundred by the time the production peak is reached). This equipment requires space. Yet at the beginning of this two-year period the Orenda engine production shop was occupying a large portion of the aircraft plant, and work on Lancasters, Sea Furies, Mitchells, and the C-102 Jetliner, was filling up a substantial part of the remainder.

To get the direly-needed CF-100 production space, the first move was to find a home for the Orenda engine shop. This necessitated a new factory. In October 1950 the first sod was broken for a 708,000-square-foot engine plant to be erected opposite the main plant. During the two years that it took to get the engine factory built and fully stocked with the hundreds of machine tools required for peak production, the work on other aircraft was progressively stopped. Thus, it was the summer of '52 before the full floor-space of the aircraft plant was cleared for the production tools, jigs and fixtures necessary to translate the 10,000 CF-100 drawings into actual parts.

But even such facilities as the above are not enough to produce a modern jet fighter and engine. Sub-contractors had to be found. In many cases eager parts-manufacturers could not be usefully employed until they had been through a time-consuming training programme in the materials, new techniques, and fine tolerances necessary for aircraft work. In a few cases new factories had to be built even for the sub-contractors. At the present time there are 400 such contractors and suppliers in the aircraft and engine programmes, and more may be added as production rolls ahead.

Between the sub-contractors and the main contractor, more than 40,000 Canadian workmen are employed. To get the 10,000 required at Avro alone, extensive training courses had to be set up. In the tight labour market of to-day, required skills cannot always be bought: they have to be developed — at the expense of production time.

* * *

While the production facilities were being set up, the aircraft itself was being shaken down in

actual flight tests. In pre-war days two prototypes were usually sufficient to put the job well in hand. But the complexity of modern aircraft has changed this concept. At the present only 3 of the first 11 CF-100's will go to operational squadrons. The remainder will be used for accelerated Service tests.

The product of these flight tests, coupled with the results of numerous static structural tests, is a continual stream of modifications. These are vital changes that weld the aircraft and engine into a superior fighting weapon. The 300 drawing changes a week that are going through the engineering department, however, result only partly from flight tests. The remainder are redesigns to facilitate manufacture with production tooling. During this development period the expansion of the production facility is continually

hampered by these changes. As a result, 30% to 40% of the production tooling has required modification. This is a costly delay, but unavoidable in turning out up-to-the-minute fighters.

A further hold-up has been precipitated by changes in production quantities. Immediately before and after the start of the Korean War the unstable world scene was reflected in unstable production policies. For example, the aircraft production rate of 5 a month was increased considerably only 1½ years ago. Similarly, production of the Orenda engine went through no less than five such changes, since it was tied in with possible use in the F-86 Sabre as well as in the CF-100.

It is the easiest thing in the world to alter a Contract Demand from "Production Rate: 30 a month" to "Production Rate: 100 a month." But what happens at the contractor's plant is a much

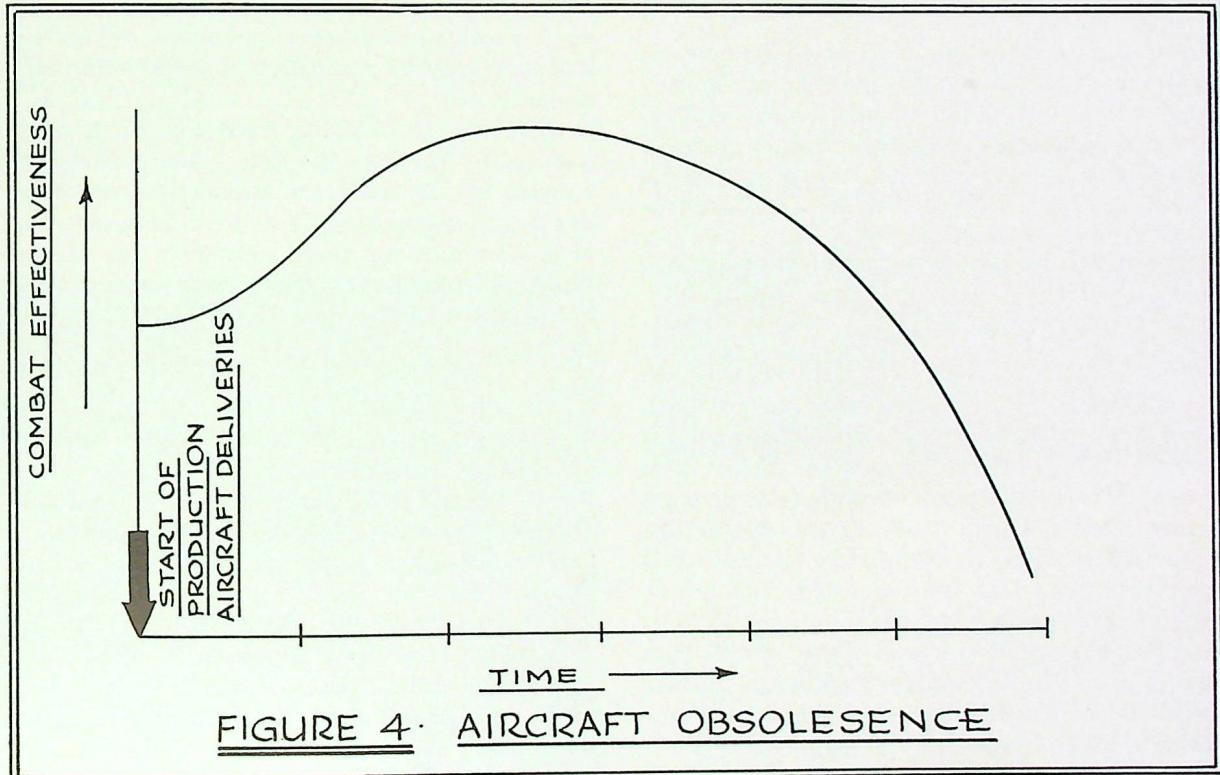
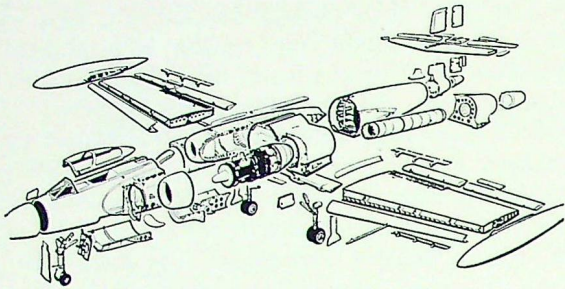


FIGURE 4. AIRCRAFT OBSOLESCENCE



more complex story. Every time production is changed it means a complete revision of all planning and shop layouts, tooling programmes, machine tool requirements, and usually a complete reissue of all purchase orders. The river of materiel flowing into the plant must be dammed up or speeded up, according as the schedule is revised upwards or downwards. Obviously such changes must be carried right back to the source of the basic materials. And, as regards time too, it is a costly business.

The unstable world panorama, with its unstable production policies and the build-up of the production facility, probably account for at least 95% of the reasons for CF-100 production's hitting the high side of the 2-year period. The other 5% can be charged to the administrative machinery; for as the company swung from a development facility to a production facility, extensive changes were necessary in the organization structure.

* * *

With the administrative machinery overhauled and production of an aircraft beginning to roll, the spectre of obsolescence is always around the corner. Though obsolescence is often spoken of as a point, it is really a graph of combat effectiveness against time (Figure 4). From the day of the fighter's first flight, or even before, modifications are planned and eased into the production line to step up the fighter's punch. At some point in time, however, the enemy produces a few aircraft that are superior to the fighter. Although further modifications are installed, they fail to stem the enemy's superiority. The fighter's effectiveness-time curve flattens out.

More and more of the superior enemy aircraft are produced. Thus, as time passes, the already flattened combat effectiveness curve of the fighter starts to decline. In the end, the fighter can find few targets that it can attack successfully. A new fighter is required. The old fighter has passed into the shadow of obsolescence, at least for its original design rôle.

It is very difficult to assess obsolescence, since, as J. H. Kindleberger, Chairman of the Board of North American, has said, "... it is awfully hard to put a time caliper on thinking and invention." This is particularly true when one is attempting to assess the enemy's capabilities. At present it takes from 8 to 9 years to develop a bomber from the first line drawn to production in quantity. This further complicates the picture. However, when the CF-100 is compared with possible future bombers that would be available in quantity, it still has a number of years to go before it starts the downward slide on the obsolescence graph of Figure 4. Similarly, when the CF-100 is assessed against other all-weather two-place fighters in the same stage of production, it is far from being obsolete.

Moreover, decisions are even now being made and major modifications are being planned to increase the CF-100's combat effectiveness. Many of these changes will not bear fruit, in terms of an actual aircraft, for some time yet; but all are aimed at keeping the combat effectiveness graph on the upward swing just as long as possible.

* * *

With future plans for the CF-100 going into the blueprint stage, the other assets that the people of Canada have acquired may well be enumerated. For the first time in history Canada has built up a new organization that is capable of designing and developing modern aircraft and engines. Furthermore, she has a production facility that can turn out not only the CF-100 and Orenda engines, but other larger and more complex types. The CF-100 and Orenda programmes alone have set up new sources of supply and new techniques, all of which have added to the vital industrialization of the country.

One question possibly remains still unanswered in the minds of our readers, and that is: "Would we have been further ahead by taking some existing aircraft and putting it into production, as was done with the Sabre?" The answer to this is a very definite "no," and events of the subsequent years have proved the validity of the decision made to develop the CF-100 — which was

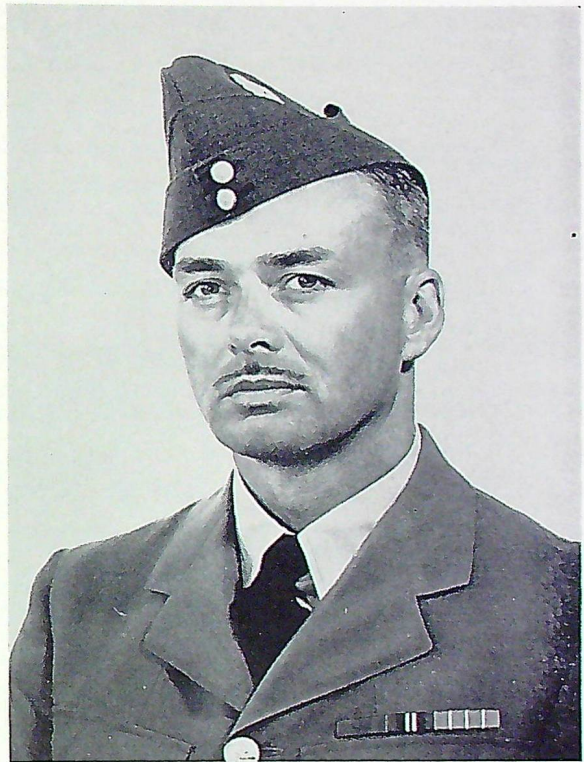
designed to meet the peculiar needs of Canada's defence. Although there are now several aircraft which excel the CF-100 in one or more fields, there is no aircraft which meets Canadian requirements in all fields. Further, it should be noted that even those aircraft that compare most favourably with the CF-100 are still in the prototype stage and a long way from production.

The Suggestion Box

The undermentioned personnel have received letters from the Chief of the Air Staff thanking them for original suggestions which have been officially adopted by the R.C.A.F.

Sqn. Ldr. E. L. Howey, D.F.C., of A.F.H.Q., proposed a revision of Form G-11 (Document Transit & Receipt) whereby it will be possible for the sender of classified documents to specify the classification required for the return of the form after the documents have been detached, thus eliminating much needless delay and cost occasioned by registration.

Sqn. Ldr. E. L. Howey, D.F.C.



W.O.2 C. C. Staples.

W.O.2 C. C. Staples, of R.C.A.F. Station Centralia, proposed the production of a special calendar for use in the R.C.A.F. His calendar would indicate Service holidays, Christmas and New Year leave periods, Service commemoration days, etc., etc.; and its twelve illustrations and their accompanying text would concern matters of interest to R.C.A.F. personnel. His suggestions are to be incorporated in a calendar for 1953.

Personnel Movements ★ ★ ★

OFFICERS: MAY

- S/L C. D. Bricker, D.F.C.—1 F.W.H.Q., U.K., to 439 (F.) Sqn., U.K.
 S/L A. G. Chalmers — R.C.A.F. Stn. Camp Borden to R.C.A.F. Stn. Moose Jaw.
 S/L E. A. Wilson — Staff Coll., Toronto, to R.C.A.F. Stn. Whitehorse.

OFFICERS: JUNE

- S/L J. F. Allan — Staff Coll., Toronto, to R.C.A.F. Stn. Bagotville.
 S/L T. G. Anderson, A.F.C.—5 A.C.W.U., Scarboro, to 271 A.D.C.C., Scarboro.
 S/L J. C. Anstead — A.F.H.Q. to R.C.A.F. Stn. Moose Jaw.
 W/C J. R. D. Braham, D.S.O., D.F.C., A.F.C.—C.J.S. London to A.D.C.H.Q., St. Hubert.
 W/C H. Bryant — R.C.A.F. Stn. Edmonton to R.C.A.F. Stn. Comox.
 S/L J. D. Dickson, D.F.C., D.F.M.—R.C.A.F. Stn. Lachine to 426 (T) Sqn., Dorval.
 S/L J. F. Drake, A.F.C.—2 (M.) O.T.U., Greenwood, to 407 (M.R.) Sqn., Comox.
 S/L A. R. Durston — 1 O.S., London, to A.F.H.Q.
 S/L V. J. Faurot, D.F.C.—A.T.C.H.Q., Lachine, to R.C.A.F. Stn. Lachine.
 S/L J. A. Ferguson — R.C.A.F. Stn. Greenwood to Air Div., France.
 S/L G. E. Grindlay, M.B.E.—Staff Coll., Toronto, to S.E.S.U.
 S/L L. A. Hall — 410 (F.) Sqn., U.K., to A.F.H.Q.
 S/L K. W. Hampson — T.A.G.H.Q., Edmonton, to R.C.A.F. Stn. Winnipeg.
 S/L A. N. Harris—C.J.S. Washington to A.M.C.H.Q., Ottawa.
 S/L C. L. Heide, D.F.C.—C.N.S., Summerside, to C.J.S. London.
 S/L A. P. Huchala, D.F.C.—1 I.F.S., Centralia, to C.J.S. London.
 S/L A. Jackson — T.C.H.Q., Trenton, to R.C.A.F. Stn. Comox.
 S/L W. J. S. Kettles — T.A.G.H.Q., Edmonton, to R.C.A.F. Stn. Edmonton.
 S/L H. J. Londeau — A.M.C.H.Q., Ottawa, to C.J.S. London.
 S/L P. D. Markham — C.J.S. Washington to R.C.A.F. Stn. North Bay.
 W/C J. D. McCallum, A.F.C.—R.O.S., Kingston, to R.C.A.F. Stn. Moose Jaw.
 S/L E. E. McCullough — C.J.S. Washington to 11 T.S.U., Montreal.
 W/C C. W. McNeill — 2 (M.) O.T.U., Greenwood, to 407 (M.R.) Sqn., Comox.
 W/C J. D. Mitchner, D.F.C.—Staff Coll., Toronto, to 434 (F.) Sqn., Uplands.
 S/L J. F. Murphy — R.C.A.F. Stn. Uplands to 1 Gr. H.Q. (Aux.), Toronto.
 S/L L. J. Nevin — A.M.C.H.Q., Ottawa, to 14 T.G.H.Q., Winnipeg.
 S/L C. W. Pierce — T.M.U., Calgary, to A.M.C.H.Q., Ottawa.
 W/C W. P. Pleasance, D.F.C.—405 (M.R.) Sqn., Greenwood, to R.C.A.F. Stn. Greenwood.
 S/L E. L. Robinson — A.F.H.Q. to S.F.C., Centralia.
 W/C H. W. Saunders — 6 R.D., Trenton, to R.C.A.F. Stn. Edmonton.
 W/C E. H. Sharpe, M.B.E.—Staff Coll., Toronto, to Air Div., France.

- S/L W. R. Tew, D.F.C.—R.C.A.F. Stn. St. Hubert to 225 A.D.C.C., St. Hubert.
 W/C L. G. R. Virr — S.E.S.U. to A.F.H.Q.
 W/C D. J. Williams, D.S.O., D.F.C.—C.J.S. Washington to A.F.H.Q.
 S/L E. R. Wilson — Staff Coll., Toronto, to R.C.A.F. Stn. Comox.
 W/C J. Woolfenden — A.F.H.Q. to C.J.S. London.

OFFICERS: JULY

- W/C F. C. Aitkens — C.J.S. London to T.C.H.Q., Trenton.
 S/L J. A. Anderson, D.S.O., D.F.C.—A.T.C.H.Q., Lachine, to 408 (P.) Sqn., Rockcliffe.
 W/C H. C. Ashdown, M.B.E.—A.F.H.Q. to C.J.S. Washington.
 S/L R. M. Beatty—2 (M.) O.T.U., Greenwood, to M.G.H.Q., Halifax.
 S/L R. M. Beer — A.F.H.Q. to 248 A.D.C.C., Chatham.
 S/L J. G. Begg — C.E. & P.E., Rockcliffe, to A.M.C.H.Q., Ottawa.
 S/L W. J. Buzza — 401 (F.) Sqn. (Aux.), St. Hubert, to A.D.C.H.Q., St. Hubert.
 G/C K. C. Cameron, M.B.E.—C.J.S. Washington to A.F.H.Q.
 S/L A. L. Campbell — A.T.C.H.Q., Lachine, to T.C.H.Q., Trenton.
 S/L S. W. L. Campbell — A.M.C.H.Q., Ottawa, to C.E. & P.E., Rockcliffe.
 S/L W. G. Chandler — 1 A.G.S., Macdonald, to R.C.A.F. Stn. Macdonald.
 S/L J. H. Cooper, D.F.C.—C.F.S., Trenton, to C.J.S. Washington.
 W/C W. G. Dever — C.J.S. London to A.M.C.H.Q., Ottawa.
 S/L M. W. Dickinson — T.C.H.Q., Trenton, to A.T.C.H.Q., Lachine.
 W/C W. L. Drake — C.J.S. Washington to Air Div., France.
 S/L A. S. Easton — A.M.C.H.Q., Ottawa, to A.F.H.Q.
 S/L C. L. V. Gervais — A.D.C.H.Q., St. Hubert, to R.C.A.F. Stn. St. Hubert.
 S/L T. Goldring — 2 P.S.U., London, to 1 F.T.S., Centralia.
 G/C C. H. Greenway, O.B.E.—A.F.H.Q. to T.C.H.Q., Trenton.
 S/L J. C. Hall, D.F.C.—405 (M.R.) Sqn., Greenwood, to 1 A.R.O.S., Clinton.
 S/L F. R. Harris, D.F.C.—R.C.A.F. Stn. Whitehorse to A.F.H.Q.
 G/C J. B. Harvey, A.F.C.—T.C.H.Q., Trenton, to C.J.S. London.
 S/L J. D. Hopkins, D.F.C.—A.F.H.Q. to C.J.S. Washington.
 S/L A. B. Johnson — 16 W.H.Q. (Aux.), Hamilton, to 1 (F.) O.T.U., Chatham.
 S/L R. T. Keill — T.A.G.H.Q., Edmonton, to 201 R.S., Mount Apica.
 G/C R. J. Lane, D.S.O., D.F.C.—R.C.A.F. Stn. Edmonton to A.F.H.Q.
 W/C W. C. Langstaff, D.F.C.—A.F.H.Q. to A.M.C.H.Q.
 S/L J. D. Lindsay, D.F.C.—413 (F.) Sqn., Bagotville, to C.J.S. Washington.
 G/C M. Lipton, A.F.C.—R.C.A.F. Stn. Gimli to Staff Coll., Toronto.
 S/L C. H. Markham — R.C.A.F. Stn. Saskatoon to A.D.C.H.Q., St. Hubert.
 S/L N. R. McGregor — R.C.A.F. Stn. Macdonald to R.C.A.F. Stn. Centralia.
 W/C E. J. McLeod — C.J.S. London to 1 F.I.S., Trenton.



S/L S. S. Mitchell — 404 (M.R.) Sqn., Greenwood, to 2 (M.) O.T.U., Greenwood.
S/L J. E. Neelin — R.C.A.F. Stn. Goose Bay to R.C.A.F. Stn. Toronto.
G/C G. H. Newsome, A.F.C. — C.J.S. London to N.A.T.O., Paris.
S/L L. R. Pattee, D.F.C. — C.J.S. London to A.F.H.Q.
S/L G. C. Peek — C.N.S., Summerside, to A.F.H.Q.
W/C R. E. Porter, A.F.C. — 1 F.I.S., Trenton, to C.J.S. Washington.
S/L W. S. Quint — 2 A.C.W.U., Chatham, to 248 A.D.C.C., Chatham.
W/C A. R. Ross — R.O.S., Kingston, to R.C.A.F. Stn. Penhold.
S/L N. A. M. Rutherford — 6 R.D., Trenton, to A.M.C.H.Q., Ottawa.
W/C J. A. Sproule, D.F.C. — Staff Coll., Toronto, to R.C.A.F. Stn. London.
S/L J. J. R. Tache — 6 R.D., Trenton, to R.C.A.F. Stn. Macdonald.
S/L W. G. Taylor — A.F.H.Q. to R.C.A.F. Stn. Trenton.
S/L N. Thorp, D.F.C. — C.J.S. London to Staff Coll., Toronto.
S/L A. Tilley, A.F.C. — A.F.H.Q. to C.J.S. Washington.
S/L P. W. E. Tuller — A.A.S., Trenton, to C.J.S. Washington.
G/C H. E. Walker — A.F.H.Q. to R.C.A.F. Stn. Edmonton.
S/L R. B. Wallace — A.F.H.Q. to R.C.A.F. Stn. Whitehorse.
S/L W. E. Watson — C.J.S. London to M.G.H.Q., Halifax.

OFFICERS: AUGUST

W/C S. J. Balke — T.C.H.Q., Trenton, to A.D.C.H.Q., St. Hubert.
S/L H. J. Bartley — C.F.S., Trenton, to 2 A.N.S., Winnipeg.
S/L F. H. Battison — R.C.A.F. Stn. Goose Bay to 2 A.C.W.U., Chatham.
W/C A. P. Blackburn, D.F.C. — A.F.H.Q. to Staff Coll., Toronto.
W/CL P. Dupuis, D.F.C. — R.O.S., Kingston, to Staff Coll., Toronto.
S/L W. E. Edser — T.A.G.H.Q., Edmonton, to A.D.C.H.Q., St. Hubert.
W/C G. J. J. Edwards, D.F.C. — A.F.H.Q. to 435 (T.) Sqn., Edmonton.
G/C G. M. Fawcett, M.B.E. — A.M.C.H.Q., Ottawa, to A.F.H.Q.
S/L W. D. Foster, D.F.C. — M.G.H.Q., Halifax, to A.F.H.Q.
S/L C. L. V. Gervais — R.C.A.F. Stn. St. Hubert to 427 (F.) Sqn., St. Hubert.
W/C R. A. Gordon, D.S.O., D.F.C. — T.C.H.Q., Trenton, to C.J.S. Washington.
S/L A. F. Green, D.F.C., A.F.C. — R.O.S., Kingston, to A.F.H.Q.
S/L B. I. Gruenwald — 2 P.S.U., London, to R.C.A.F. Stn. Edmonton.
S/L D. Halcrow — 2 (M.) O.T.U., Greenwood, to 407 (M.R.) Sqn., Comox.
S/L W. A. Halpin — A.F.H.Q. to A.M.C.H.Q., Ottawa.
S/L K. W. Hampson — R.C.A.F. Stn. Winnipeg to 14 T.G.H.Q., Winnipeg.
S/L L. J. Hill — C.J.S. Washington to T.C.H.Q., Trenton.
W/C R. B. Ingalls, D.S.O., D.F.C. — R.O.S., Kingston, to Staff Coll., Toronto.
W/C R. R. Ingrams, D.F.C., A.F.C. — A.F.H.Q. to C.J.S. Washington.
S/L J. M. MacArthur — 1 F.W.H.Q., U.K., to 30 A.M.B., U.K.
S/L H. M. Miller — 1 A.R.O.S., Clinton, to R.U., Toronto.
G/C J. B. Millward, D.F.C. — Royal Rds., Victoria, to R.C.A.F. Stn. Trenton.

W/C J. C. Mulvihill, A.F.C. — A.F.H.Q. to Staff Coll., Toronto.
W/C G. B. Murray, D.F.C. — R.C.A.F. Stn. Calgary, to Staff Coll., Toronto.
W/C D. G. M. Nelson — R.C.A.F. Stn. Rockcliffe to A.F.H.Q.
G/C E. M. Reyno, A.F.C. — Staff Coll., Toronto, to A.F.H.Q.
W/C L. A. Rosenthal — A.T.C.H.Q., Lachine, to A.M.C.H.Q., Ottawa.
S/L E. H. Shaw, D.F.C. — R.C.A.F. Stn. Camp Borden to 111 C. & R. Flt., Winnipeg.
S/L J. H. Simpson, A.F.C. — 111 C. & R. Flt., Winnipeg, to T.C.H.Q., Trenton.
W/C E. A. Smith — C.J.S. Washington to 1 S.D., Weston.
W/C E. E. Smith, M.B.E. — A.M.C.H.Q., Ottawa, to A.F.H.Q.
W/C J. M. Stroud, D.F.C. — A.D.C.H.Q., St. Hubert, to 209 R.S., Falconbridge.
W/C D. R. Walker, D.F.C. — A.M.C.H.Q., Ottawa, to A.F.H.Q.
W/C W. Weiser, M.B.E., D.F.C. — C.J.S. Washington to T.C.H.Q. Trenton.

WARRANT OFFICERS: MAY

WO2 J. J. Cook — 1 F.W.H.Q., U.K., to 439 (F.) Sqn., U.K.
WO2 P. A. Thompson — 1 F.W.H.Q., U.K., to 439 (F.) Sqn., U.K.

WARRANT OFFICERS: JUNE

WO1 T. L. Barrett — 1 F.W.H.Q., U.K., to 30 A.M.B., U.K.
WO2 A. R. Chessum — A.M.C.H.Q., Ottawa, to 1 O.S., London.
WO2 W. M. Fleming — R.C.A.F. Stn. Trenton to R.C.A.F. Stn. Claresholm.
WO1 J. J. Frost — R.C.A.F. Stn. Trenton to R.C.A.F. Stn. Aylmer.
WO2 L. L. King — R.C.A.F. Stn. Greenwood to A.F.H.Q.
WO2 E. H. Knoblanck — R.C.A.F. Stn. Clinton to T.C.H.Q., Trenton.
WO2 A. E. Lagrave — A.M.C.H.Q., Ottawa, to 1 S.D., Weston.
WO2 R. D. Miller — 30 A.M.B., U.K., to 1 F.W.H.Q., U.K.
WO2 J. R. Sands — A.F.H.Q. to 1 O.S., London.
WO2 J. G. Wilson — R.C.A.F. Stn. London to 1 O.S., London.
WO1 L. H. J. Wood — 11 S.D., Calgary, to 1 O.S., London.

WARRANT OFFICERS: JULY

WO2 J. F. Allen — T.C.H.Q., Trenton, to S.H.A.P.E., Paris.
WO1 H. C. Brisco — A.M.C.H.Q., Ottawa, to 1 O.S., London.
WO1 S. R. Carter — R.C.A.F. Stn. Chatham to Air Div., France.
WO1 J. M. Cheek — T.C.H.Q., Trenton, to 1 O.S., London.
WO2 J. Cobain — 2 M.D., St. Johns, to Royal Rds., Victoria.
WO1 R. C. Crampton — 1 T.T.S., Aylmer, to 1 O.S., London.
WO1 A. Crew — R.C.A.F. Stn. Whitehorse to 1 O.S., London.
WO1 J. M. Dechene — 5 S.D., Moncton, to R.C.A.F. Stn. Greenwood.
WO2 A. K. Dowds — 2 T.T.S., Camp Borden, to T.C.H.Q., Trenton.
WO1 R. J. Ferrier — 11 S.D., Calgary, to 1 O.S., London.

WO2 E. R. L. Gauthier — 6 R.D., Trenton, to C.E. & P.E., Rockcliffe.
 WO1 F. O. Gibbs — 6 R.D., Trenton, to 1 O.S., London.
 WO1 V. I. Gillette, B.E.M. — T.C.H.Q., Trenton, to 1 O.S., London.
 WO2 J. W. Graham — 2 S.D., Vancouver, to 10 T.S.U., Calgary.
 WO2 W. J. Gravelle — R.C.A.F. Stn. Aylmer to R.C.A.F. Stn. Rockcliffe.
 WO1 G. E. Grenke — 10 T.S.U., Calgary, to 6 R.D., Trenton.
 WO2 H. G. Halward — R.C.A.F. Stn. Centralia to R.C.A.F. Stn. Saskatoon.
 WO2 D. A. Heath — R.C.A.F. Stn. Sea Island, to Air Div., France.
 WO2 A. Heeson — 1 S.D., Weston, to 2 C.M.U., Calgary.
 WO2 M. J. Herriot — A.D.C.H.Q., St. Hubert, to 1 O.S., London.
 WO1 G. H. F. Irving — R.C.A.F. Stn. Trenton, to 1 O.S., London.
 WO2 J. P. Johnstone — 10 T.S.U., Calgary, to Air Div., France.
 WO2 M. Konick — 408 (P.) Sqn., Rockcliffe, to 1 O.S., London.
 WO2 J. L. LaChance — 410 (F.) Sqn., U.K., to 2 P.S.U., London.
 WO1 F. B. Machan — 404 (M.R.) Sqn., Greenwood, to 407 (M.R.) Sqn., Comox.
 WO1 D. R. MacLean — A.D.C.H.Q., St. Hubert, to 1 O.S., London.
 WO2 J. J. MacMaster — 12 T.S.U., Weston, to A.M.C.H.Q., Ottawa.
 WO2 J. I. F. Masse — R.C.A.F. Stn. Toronto to 30 A.M.B., U.K.
 WO2 J. A. Matheson — R.C.A.F. Stn. Centralia to 2 T.T.S. Camp Borden.
 WO2 J. C. McKenna, M.B.E. — 25 A.M.B., Calgary, to R.C.A.F. Stn. Penhold.
 WO2 S. Molinski — A.F.H.Q. to 1 S.D., Weston.
 WO2 A. R. Murdock — 6 R.D., Trenton, to 2 T.T.S., Camp Borden.
 WO1 C. H. Nauffts — M.G.H.Q., Halifax, to 1 M.M.U., Montreal.
 WO2 H. E. Ostrander — A.D.C.H.Q., St. Hubert, to 12 A.D.G.H.Q., Vancouver.
 WO2 R. H. Perks — A.F.H.Q. to 1 O.S., London.
 WO1 T. C. Porter — A.M.C.H.Q., Ottawa, to 1 O.S., London.
 WO2 J. S. Sangster — 2 T.T.S., Camp Borden, to 11 T.S.U., Montreal.
 WO2 G. T. Simoneau — A.M.C.H.Q., Ottawa, to 407 (M.R.) Sqn., Comox.
 WO2 R. F. Stephenson — R.C.A.F. Stn. Claresholm to 1 O.S., London.
 WO2 J. B. Swetnam — R.C.A.F. Stn. Gimli to R.C.A.F. Stn. Winnipeg.
 WO2 W. E. Traynor — A.F.H.Q. to 1 O.S., London.
 WO2 B. M. Vansickle — 10 E.U., Camp Borden, to 1 O.S., London.

WARRANT OFFICERS: AUGUST

WO1 K. D. Bateman — R.C.A.F. Stn. Lachine to 1 O.S., London.
 WO2 H. E. Bennett — 1 R.C.S., Clinton, to 1 O.S., London.
 WO1 E. B. Brackenbury — R.C.A.F. Stn. London to 1 O.S., London.

WO2 R. E. Collis — R.C.A.F. Stn. Centralia to R.C.A.F. Stn. London.
 WO2 J. G. Ellison — R.C.A.F. Stn. Lachine to 4 (T.) O.T.U., Lachine.
 WO2 E. Ferguson — 1 S.D., Weston, to 25 A.M.B., Calgary.
 WO2 M. J. Haider — R.C.A.F. Stn. Gimli to 14 T.G.H.Q., Winnipeg.
 WO1 E. Harkin — R.C.A.F. Stn. Summerside to R.C.A.F. Stn. St. Hubert.
 WO2 J. H. Henderson — R.C.A.F. Stn. Goose Bay to R.C.A.F. Stn. North Bay.
 WO1 D. J. Ing — 5 S.D., Moncton, to 2 C.M.U., Calgary.
 WO2 A. F. Jones — 2 P.S.U., London, to 1 O.S., London.
 WO2 W. S. Kennedy — A.A.S., Trenton, to 1 O.S., London.
 WO2 D. R. Miller — 1 F.W.H.Q., U.K., to 30 A.M.B., U.K.
 WO2 B. G. Moodie — A.M.C.H.Q., Ottawa, to A.D.C.H.Q., St. Hubert.
 WO2 M. J. Muntean — A.F.H.Q. to 1 O.S., London.
 WO1 J. P. Niven — R.C.A.F. Stn. Bagotville to A.D.C.H.Q., St. Hubert.
 WO1 T. H. O'Neill — 6 R.D., Trenton, to 10 T.S.U., Calgary.
 WO2 R. C. Pambrun — R.C.A.F. Stn. Rockcliffe to A.F.H.Q.
 WO2 W. B. Walker — T.C.H.Q., Trenton, to 1 O.S., London.
 WO2 R. J. Watson — R.C.A.F. Stn. Trenton to R.C.A.F. Stn. Macdonald.
 WO2 G. D. Wilson — A.F.H.Q. to A.M.C.H.Q., Ottawa.
 WO2 W. Winchuk — R.C.A.F. Stn. Summerside to Photo Est., Rockcliffe.

KEY TO ABBREVIATIONS

A.A.S.	— Air Armament School
A.C. & W.U.	— Aircraft Control & Warning Unit
A.D.C.C.	— Air Defence Control Centre
A.D.C.H.Q.	— Air Defence Command Headquarters
A.D.G.H.Q.	— Air Defence Group Headquarters
A.G.S.	— Air Gunnery School
A.M.B.	— Air Materiel Base
A.M.C.H.Q.	— Air Materiel Command Headquarters
A.N.S.	— Air Navigation School
A.R.O.S.	— Air Radio Officers' School
A.T.C.H.Q.	— Air Transport Command Headquarters
C.E. & P.E.	— Central Experimental & Proving Establishment
C.F.S.	— Central Flying School
C.J.S.	— Canadian Joint Staff
C.M.U.	— Construction & Maintenance Unit
C. & R. Flt.	— Communication & Rescue Flight
E.U.	— Exam. Unit
(F.)	— Fighter
F.I.S.	— Flying Instructors' School
F.T.S.	— Flying Training School
F.W.H.Q.	— Fighter Wing Headquarters
I.F.S.	— Instrument Flying School
(M.)	— Maritime
M.D.	— Manning Depot
M.G.H.Q.	— Maritime Group Headquarters
M.M.U.	— Materiel Movements Unit
(M.R.)	— Maritime Reconnaissance
N.A.T.O.	— North Atlantic Treaty Organization
O.S.	— Officers' School
O.T.U.	— Operational Training Unit
(P.)	— Photographic
P.S.U.	— Personnel Selection Unit
R. & C.S.	— Radar & Communications School
R.D.	— Repair Depot
R.O.S.	— Reserve Officers' School
R.S.	— Radio Station
R.U.	— Recruiting Unit
S.D.	— Supply Depot
S.E.S.U.	— Suffield Experimental Station Unit
S.F.C.	— School of Flying Control
S.H.A.P.E.	— Supreme Headquarters Allied Powers Europe
(T.)	— Transport
T.A.G.H.Q.	— Tactical Air Group Headquarters
T.C.H.Q.	— Training Command Headquarters
T.G.H.Q.	— Training Group Headquarters
T.M.U.	— Telecommunication Maintenance Unit
T.S.U.	— Technical Service Unit
T.T.S.	— Technical Training School
W.H.Q.	— Wing Headquarters

R.C.A.F. Emergency Seat Packs

By Flight Lieutenant J. Jaworski, A.F.C.,
Institute of Aviation Medicine, R.C.A.F.

(It can now be said that the fighter pilot is no longer, in a "survival" sense, the forgotten man of aviation. The development of survival equipment for his use has come a long way since the days when, in an emergency, he depended on a few flimsy rations stuffed hurriedly into his pockets. This article sketches briefly the recent history of seat pack research, and, besides setting out in detail the contents of two basic seat packs of latest design, it describes the more important innovations of each.—EDITOR.)

SPACE AND WEIGHT LIMITATIONS have constantly handicapped the fighter pilot with respect to the amount of survival equipment he can carry. For his benefit, therefore, and for that of the single-engine pilot in general, the idea of a back and seat type of emergency pack has been gradually evolved. This evolution has been dependent upon the type of parachute worn and upon the area of operation.

Prototype seat packs were carried in R.C.A.F. Vampire and Mustang aircraft which were engaged in "Operation Sweetbriar" in 1950. Rather hastily assembled, they were meant to fulfil an immediate requirement, and were therefore practical only within certain limitations. It is hoped, however, that their successors, modified and considerably improved, will eventually be standardized in the R.C.A.F., R.A.F., and U.S.A.F. At any rate, aircraft designers are now co-operating to provide sufficient seat space for emergency equipment stowage.

The R.C.A.F.'s first steps toward attainment of a really suitable emergency seat pack were taken about a year ago, when the Institute of Aviation Medicine was authorized to construct an emergency kit containing those items listed by the Protective Emergency Kit Committee as being appropriate for survival. It was to be interchangeable in F-86, T-33, Mustang, and Harvard aircraft. Comfort was a major consideration, but g forces acting on pilot and pack during ejection had to be considered. This was studied on the ejection tower at Wright Patterson Air Force Base,

Dayton, Ohio, by the author, who carried out a total of ten seat-ejections over a six-hour period, averaging 14 g maximum per ejection.

Since it was thought that duraluminum might be in short supply during wartime, a plastic container measuring 15" x 14" x 9" was adopted by the R.C.A.F. Such compactness necessitated a critical packing process. The completed pack was flight-tested, dropped, and evaluated in a decompression chamber up to heights in excess of 40,000 ft.

There are at present two basic types of seat pack — the Winter Inland Pack and the Maritime Inland Summer Pack.

Winter Inland Pack. Of conventional design, this contains several interesting innovations,

Maritime Inland Summer Pack, showing dinghy-opening operation and placement of waterproof inner container holding survival equipment.

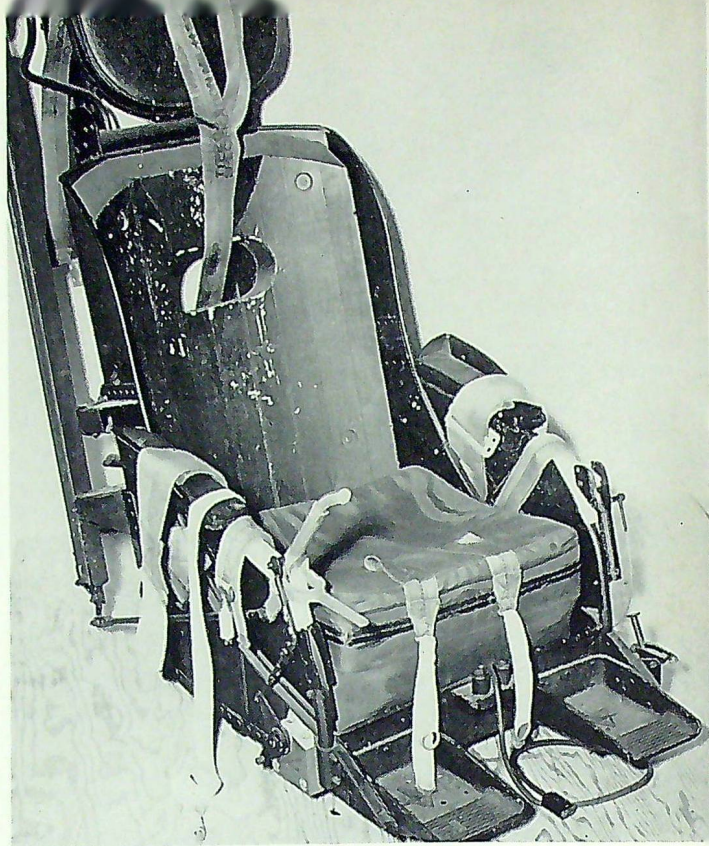


among which are: a sleeping bag good for 30° below zero, a .22 Hornet rifle whose bullet can pierce a 1/4-inch steel plate at 50 yards, and a primus stove and fuel.

Also contained in this pack are: emergency radio transmitter and battery, .22 ammunition, 6-inch file, clasp knife, housewife, eye shields, signal flares, fishing kit, food pack, heliograph mirror, compass, fire tablets, whistle, snare wire, snow knife, candle, handkerchief tissue, first aid kit, mukluks, socks, hand soap paper, insoles, duffles, gloves, mitts, splint wire, C.A.P. 361, water-proof matchbox, and matches.

Maritime Inland Summer Pack. Designed for use over land or water, the major item of this pack is the one-man K-type dinghy with quick-release fittings. The contents are placed in a

The author, wearing newly-approved life-saving waist-coat.



Maritime Inland Summer Pack in F-86 ejection seat.

rubberized waterproof container attached to the floor of the dinghy. A lanyard prevents the pack from drifting away from the dinghy if it is placed outside during bailing operations. Later packs will have a quick-donning lightweight ditching-suit placed at the top of the rubberized container. When water and air temperatures are critical, the pilot can don the ditching-suit over his wet clothing, and the trapped body-heat will mean the difference between life and death.

Among the other more important items found in this pack and not included in the winter pack are: de-salting kit, water-purifying tablets, insect repellent, sun-burn lotion, axe, and sponge. On the other hand, not found in the summer pack are: sleeping-bag, primus stove, mukluks, and snow-knife. In practically all other respects the packs are similar in content.

The first formation to be equipped with the new type of kit was No. 1 Fighter Wing, North Luffenham. Also, the Maritime Inland Summer Pack was issued to No. 439 (F.) Squadron before its recent flight to the U.K.



Flying Your Own Aircraft

FACTS AND FIGURES FOR THE WOULD-BE PRIVATE OWNER

By Margaret Carson

(Miss Carson's name is already well known to a large number of our readers. She has been flying since 1939, and in 1951 she won the All-Women's International Air Race from Orlando, Florida, to Windsor, Ontario — the first race she had ever entered. Many, too, will doubtless remember her from her R.C.A.F. days when she served as an Administrative Officer in the Women's Division from 1941 to 1946. The present article, which she was kind enough to prepare at our request, contains a more factual presentation of the financial aspect of private 'plane ownership than we have yet read anywhere. It is a subject on which Miss Carson is well qualified to speak, since she herself has owned and flown three four-place aircraft as well as the Stinson Station Wagon 165 in which she won the race above referred to.

"All the figures given," she writes, "are only approximate, of course. There will certainly be some private owners who consider them too low, and others who think them too high. I have, however, done my best to strike an average resulting from consultation with Department of Transport Civil Aviation officials, and numerous private owners, engineers, and commercial pilots, and from my own experience. I hope that it will help to dispel the all-too-prevalent misconception that private 'plane ownership is beyond the means of the man or woman in anything but the highest income brackets."—EDITOR.)

INTRODUCTION

COMPARED WITH TRAVEL by bus, train, or automobile, travel by private aircraft is a fast, safe, and economical means of transportation for anyone who makes frequent trips either on business or for pleasure.

There are now more than 403 airports and sea-plane bases (*excluding* those used purely for military purposes) in Canada, and 6,243 (*including* military) in the United States. In addition to these, there are many unlicensed fields and landing strips. The "Canada Air Pilot" lists all licensed landing areas in Canada, while most of the airports in the United States are listed in the "Airmen's Guide." Several organizations publish booklets which give the location of hundreds of Airtels, Skytels, and Air Resorts in the United States and Canada, and which also describe all the facilities available at each — oil, gas, maintenance, hangar or tie-down fees, length and type of runways, etc.

The authoress, during the war.



A 19-day holiday by air can be enjoyed for as little as \$97.50. I returned to Ottawa recently from a round trip (with two passengers) to Florida and Mexico City, a distance of approximately 6,700 miles. We stopped at thirty airports. We were grounded, on account of bad weather, for almost three days; we spent five in Mexico City, two in New Orleans, and two in Miami. We shared the cost of gasoline, oil, hangar storage, tie-down, customs fees, minor maintenance en route, and we sent wires home from each stop. Yet our total expenses amounted to only \$293.50, or \$97.50 each. We could certainly never have covered the same territory by automobile in anything like the same time, and the expenses would, therefore, undoubtedly have been considerably greater.

I might also quote the case of the light-aircraft owner who, on a typical day's business-flying, left Indianapolis, Ind., at seven o'clock in the morning, picked up two passengers at Atlanta, Ga., stopped at Valdosta, Ga., for lunch and a business meeting, and then flew to Jacksonville, Fla., for another conference. He returned to Atlanta, dropped his two passengers, had dinner with them, and returned to Indianapolis, where he landed at ten forty-five the same night. The trip was made in a "Navion," a single-engine four-place aircraft.

Such examples as the two I have given above might be multiplied indefinitely, but there is no point in adding to them here. My present purpose is to show that anyone who can afford to run a good car can afford to fly his own aircraft.

INITIAL COST

Two-place: 85 h.p.

This group includes such aircraft as the Piper, Cessna, Aeronca, Luscombe, etc. Purchase prices range from \$3,500 to \$5,000; or second-hand, from \$1,000 to \$2,500.

Four-place: 125, 145, 150, 165 h.p.

In this class we find such aircraft as the Stinson 108, Cessna 170, Piper Pacer, Aeronca Sedan, Bellanca Cruisair, etc. New, they cost from \$6,800 to \$10,000; and second-hand, from \$3,500 to \$7,000.



Stinson 108: 165 h.p.

The above prices usually include two-way radio, but they will vary according to the other equipment desired. Import duties have recently been lifted from aircraft, aircraft parts, and aircraft equipment — provided that they are of a type and size not manufactured in Canada. This fact should result in a material decrease in the initial cost of light aircraft and parts.

* * *

Anyone who is thinking of purchasing an aircraft should consider whether it is to be used on wheels only or also on skis and floats. An aircraft of a type that is approved for wheels, skis and floats (preferably with float fittings already installed) is the most practical for use in Canada and can always command a higher resale price.

INSURANCE

Although it is not compulsory to carry insurance for a privately registered aircraft, I personally consider the following coverage to be essential:

- Passenger liability: \$10,000 per passenger seat.
- Public liability: \$50,000.
- Property damage: \$25,000.

On the above basis, essential insurance on a two-place aircraft will cost \$96.70 a year (\$8.06 a month), while on a four-place aircraft the same insurance will cost \$144.30 a year, or \$12.03 a month.



Aeronca Champion: 65 h.p.

HANGAR STORAGE

A flying club charges its members anything from \$15 to \$20 a month for hangar storage for a two-place or four-place light aircraft. In a Department of Transport hangar and in some commercial hangars, aircraft with a wing span of up to 35' may be stored from \$16.75 to \$24.80 a month, plus an additional heating charge of about 40c. a day during the winter months. Outside tie-down rates are very low, but the depreciation on the aircraft is far greater. No landing fees are required for private aircraft with a licensed gross take-off weight of less than 5000 lbs.

DEPRECIATION

Depreciation on an aircraft is, of course, a very debatable matter, since it depends to a large extent on the care with which the aircraft has been maintained and on the way in which it has been handled both in the air and on the ground. But, generally speaking, we are safe enough in saying that an aircraft which was purchased new five years ago would now be worth approximately 50% of its original cost. This represents an average depreciation rate of 10% a year.

Corporations owning aircraft for use in connection with their business are, for taxation purposes, permitted to write off depreciation at the rate of 25% a year.

FUEL CONSUMPTION

An 85-h.p. engine burns approximately 4½ gallons of 80-octane gasoline an hour. Thus, an aircraft with an average airspeed of 100 m.p.h., flying 100 hours a year, would travel 10,000 miles on 425 gallons of fuel — approximately 23 miles to a gallon. Gasoline at present costs 40c. a gallon, and there is an airport tax of 1c. a gallon. In the province of Ontario a provincial highway tax of 11c. a gallon is also levied on aviation gasoline, but, since this is refundable, it is not taken into consideration in this article.

A 125, 145, 150, or 165-h.p. engine burns an average of 8 gallons an hour. Flying at an average airspeed of 120 m.p.h. for 100 hours a year, an aircraft would consume 800 gallons while travelling 12,000 miles. In other words, an aircraft of these h.p. ratings flies approximately 15 miles to a gallon of gasoline. (The airport and provincial highway taxes are the same as for an 85-h.p. engine.)

The oil capacity is 4 quarts in an 85-h.p. engine and approximately 7 quarts in a 125, 145, 150, or 165 h.p. engine. Oil changes are usually made every 25 hours, with an average consumption of 1 to 2 quarts between each change. Fifty cents a quart is the general price of oil.

MAINTENANCE

Maintenance costs vary greatly according to where the work is done and how much the owner is able to do himself. Below are given a few of the items which must be taken into consideration.

Certificate of Airworthiness. Once a year every privately registered aircraft must be inspected and signed out by a licensed engineer. During that period, all inspections and maintenance are the responsibility of the pilot and the owner. The cost of the C. of A. inspection and signature (not including any labour or parts which may be necessary) is usually in the region of \$15.00 to \$30.00 for a light aircraft.

Major Overhaul. The Department of Transport requires a major overhaul of light aircraft engines every 600 hours. It must be carried out by an approved overhaul shop, and the prices, for labour only, average \$200 for an 85-h.p. engine

and \$300 for a 125, 145, 150, or 165-h.p. engine. Spark plugs, piston rings, etc., which are usually replaced at this time, cost extra.

Battery. In an aircraft with a self-starter and radio, the battery usually lasts about two years and costs about \$55 to replace.

Tires. Tires should last from 300 to 600 hours, depending upon the number of landings and whether the landings are made on hard-surfaced runways or on grass. Tires, including the tail wheel, cost approximately \$28 each.

Radio. Radio maintenance and replacement of parts should average about \$5 a year. Radio equipment is not compulsory, but it is advisable. Without it, the pilot is limited in the number of airports that are available to him.

(Complete information on the regulations covering the operation of light aircraft may be obtained from the Department of Transport, Civil Aviation Branch, Ottawa, Ont.)

TOTAL COST

Assuming that we have purchased our aircraft, and calculating our gas and oil consumption on the basis of 100 hours' flying a year, our operating costs should be somewhere in the vicinity of those given below. For the cost of maintenance I have taken \$2 an hour as the basis for a two-place aircraft and \$2.50 for a four-place. Those two figures do not include the cost of major overhaul of engine or airframe, or of repairs or replacements

necessitated by damage. Nor have I taken depreciation into consideration. Such costs are, as I have already indicated, somewhat variable; and the reader can easily estimate them, according to his knowledge of his own skill, from the approximate figures I have mentioned under the headings "Depreciation" and "Maintenance."

	Two-place	Four-place
Gas (airport tax incl.).....	\$174.25	\$328.00
Oil.....	12.00	18.00
Hangar storage.....	216.00	216.00
Insurance.....	96.70	144.30
Maintenance.....	200.00	250.00
Approx. yearly total.....	\$698.95	\$956.30

By obtaining reasonable quotations on labour and parts, the private pilot should be able to get a lot of fun and use out of an aircraft at a fairly reasonable cost. For anyone who is willing to fly without radio and self-starter, to tie his aircraft down outside instead of storing it in a hangar, and who is mechanic enough to carry out most of his own maintenance, the total operating costs will be considerably less than those shown above. In shopping around for reasonable rates on maintenance labour, however, it is of the utmost importance to insure that no sacrifice is made in the quality of workmanship. It must never be forgotten that good maintenance is good life insurance.

FINAL REMARKS

If you are an active pilot in the R.C.A.F. you are eligible to receive a private license on successful completion of a written examination on Air Regulations and Air Traffic Rules and Procedures. Retired Service pilots, whether Regular or Reserved, may be granted certain concessions with respect to the issue of pilot licenses if application is made within three months of termination of Service duty. Conditions governing the issue of licenses in such cases are outlined in the Department of Transport's Civil Aviation Branch Circular 0/49/51. Persons who have never been qualified pilots may obtain Private Licenses under the Government Subsidy Plan for approximately \$195. Further information on this Subsidy Plan may be obtained from Information Circulars

Cessna 140: 85 h.p.





Bellanca Crusair: 150 h.p.

0/4/51 and 0/32/51, or from the nearest flying school or flying club.

* * *

I have already touched very briefly on both the advantages and the pleasure to be derived from private flying. There exists, however, an even more important aspect of the subject to be taken into consideration, namely, the defence of Canada. For we should remember that the more private aircraft that fly in our skies, the stronger will be our aviation industry, the larger the number of ready-trained pilots in the event of emergency, and therefore the greater our national security.

GERMAN ROCKET MAIL

It is interesting to note that a number of engineers who once worked on the notorious A.4 ("V-2") rockets have formed themselves into a group ostensibly to perfect a mail-carrying guided rocket. They have already carried out one test launch from a 20-ft. ramp sited on the heathland behind Bremen.

Professor Puellenberg, the leader of the project, is reported to have said, "We had some trouble finding the correct detonator, but hope to go ahead now. If we can get backing from the German Post Office, we hope to open rocket deliveries up to 20 miles, and within four years we can have a chain covering the whole of Germany." Their rocket — progress of which is being carefully watched by the British occupying authorities — is stated to carry a payload of 660 lb. and to be capable of guidance to a target "the size of a postage stamp".

(*"Flight"*: U.K.)

★ What's the Score?

"I have not forgotten," writes Sgt. Shatterproof in a last-minute note, "my promise to forward you a questionnaire on interplanetary protocol and trans-spatial intercourse generally. So far, however, I have not had time to complete the necessary research. In the interim, I suggest that you continue with your Service knowledge questions. Though too elementary to interest anyone except our newest recruits, they may at least serve to broaden the outlook of the Editorial Committee."— The average score of the members of the Editorial Committee was 15. Correct answers appear on page 48.

1. "Explosive decompression" means:

- (a) Failure of pressurized cabin.
- (b) Rupture of the internal organs of a crash victim.
- (c) Sudden collapse of lungs occasioned by failure of oxygen supply.
- (d) Damage to middle ear during rapid descent when Eustachian tube is blocked.

2. The radio altimeter used in R.C.A.F. aircraft shows:

- (a) The height of the aircraft above airport of destination.
- (b) The height of the aircraft above sea-level.
- (c) The height of the aircraft above the terrain below.
- (d) The height of the mountains in the vicinity of the aircraft.

3. If you contribute under Part V of the Defence Services Pension Act, your pension will be calculated on:

- (a) Your pay and allowances on the last day of your service.
- (b) The average of the pay and allowances you have received during the last six years of your service, plus a valuation placed on medical and dental care and (if you are an airman) clothing.
- (c) The average of your pay and allowances for the last six years of your service.
- (d) Your pay of rank only at the date of release.

4. The minimum area required for a combined air-to-ground gunnery, rocket, and bombing range is:

- (a) 1280 acres.
- (b) 7420 acres.
- (c) 4000 acres.
- (d) 3680 acres.



5. A zero reader is:

- (a) A gyroscopic flight instrument used by the pilot.
- (b) A type of thermometer used in the Arctic.
- (c) An illiterate.
- (d) A visual warning device attached to a certain type of fuel gauge.

6. The R.C.A.F. has adopted the nautical mile as a unit of measurement:

- (a) Because the R.C.N. has always found it most satisfactory.
- (b) Because it's easier to calibrate instruments in nautical than in statute miles.
- (c) As a security precaution.
- (d) In order to relate linear measurement with measurement of an arc.

7. An all-weather interceptor is:
- A ground-to-air missile which can seek out and destroy enemy aircraft under any weather conditions.
 - An aircraft designed to find and shoot down enemy aircraft in any sort of weather and/or at night.
 - A flying weather-laboratory for the study of unusual meteorological phenomena.
 - A balloon barrage along a coast or round a city.
8. In the R.C.A.F., the initials M.T.I. stand for:
- Moving Target Indicator.
 - Military Technical Intelligence.
 - Motor Transport Inspector.
 - Master Technician (Instrument).
9. Historical narratives should be submitted by all units to the Air Historian:
- Whenever the unit's C.O. is transferred.
 - At the end of each fiscal year.
 - Semi-annually.
 - Whenever something out of the ordinary occurs.
10. In the Second World War the number of V.C.'s awarded to members of the R.C.A.F. was:
- 2
 - 4
 - 1
 - 3
11. The bird shown on the R.C.A.F. badge is, officially:
- An albatross.
 - A Canada goose.
 - An eagle.
 - An albatreagle.
12. The highest speed yet attained by a guided missile is:
- 500 m.p.h.
 - 800 m.p.h.
 - 7,000 m.p.h.
 - 5,000 m.p.h.
13. Flak intelligence will *not* determine:
- The optimum altitude for attack.
 - The type of shell and fuse to be used.
 - The most favourable axis of attack.
 - The evasive action to be taken prior to a bombing-run.
14. The number of R.C.A.F. Recruiting Units in Canada is:
- 56
 - 94
 - 42
 - 21
15. The log books of an aircraft involved in a flying accident must be impounded and left in the custody of:
- The A.I.B. inspector.
 - The C.O.
 - The Station Adjutant.
 - The Senior Flying Control Officer.
16. The Air Force Trade Code, which contains as many as seven digits:
- Identifies a tradesman by trade, group, rank, and specialties.
 - Replaces an airman's regimental number.
 - Shows an airman's position on the seniority list.
 - Is recorded by the R.C.M.P.
17. If apparently inadequate distribution of "The Roundel" precludes you from seeing it regularly, you should:
- Write a letter of protest to your member.
 - Light the fire with A.F.R.O.'s instead.
 - Lynch the Adjutant.
 - Write to the Editor direct.
18. The component part of strategic intelligence which deals with personalities is the:
- Geographical.
 - Pornographical.
 - Biographical.
 - Cartographical.
19. The letters "MIG" are an abbreviation of the words:
- Mikoyan Gurevich.
 - Medium Interceptor (Ground).
 - Manchurian Intruder Group.
 - Molotov Ilyushyn Golovanov.
20. If you follow the procedure specified in the correct answer to question 17, your name will be:
- Long remembered by the Adjutant.
 - Blessed by the Editorial Committee and treated as strictly confidential.
 - Passed on to the Director of Air Force Security, who will send a posse to investigate you.
 - Reported to the R.C.M.P. as being that of a subversive character.

ROYAL CANADIAN AIR FORCE

Association



MEMBERSHIP CAMPAIGN

The Association is embarking on an intensive membership campaign, the first stage of which will be a Wing competition with prizes to be awarded to the three Wings showing the greatest progress. The basis of assessment will be fair and equitable to all Wings, regardless of size or potential. The winning Wings will be awarded the R.C.A.F. Association Colour with Wing scroll.

To the member of each Wing bringing in the most new members will be granted a life membership in the Association, provided the new member credit is not less than ten per individual competitor. Each Wing will make a recommendation of one person who was outstanding in getting new members.

The second stage will be a campaign for the Association as a whole. An inducement will be offered to every member as an individual, the nature of which will be announced in "The Roundel" next month, together with the duration of the competition referred to in the first paragraph.

A preliminary step in the general campaign was taken when a progress report, in the form of a news-letter from our National President, was sent to everyone on the C.A.S.'s News-Letter distribution list. In retrospect, progress since the last letter of this type in October, 1949, has been considerable.

WINNER OF PAINTING COMPETITION

William Goodridge Roberts, a Montreal member-at-large, was the winner of the painting competition held in order to obtain a canvas of a

Canadian scene to be presented to Her Majesty Queen Elizabeth II, our patron.

"Goody," as he is better known, is a member of the Roberts family, famous in Canadian literature and art, his father being the novelist Theodore Roberts and his uncle being the late Charles G. D. Roberts. He was a war artist with the R.C.A.F., and most of his service was overseas. Mr. Roberts was one of four Canadian artists selected to represent Canadian art at the Biennale Exhibition in Venice this year.

The competition was open only to those eligible for membership in the Association, and entries were of a very high standard. Thirty paintings were submitted by some twenty competitors.

A joint committee of the Association and the National Art Gallery made the selection. Before judging, the paintings were hung in the Odeon Theatre, Ottawa, and received very favourable public attention.

AMERICAN A.F.A. CONVENTION

Air Vice-Marshal A. L. Morfee, C.B., C.B.E., our National President, and representatives of National Headquarters attended the American Air Force Association Convention in Detroit from August 28th to 31st. Members of No. 306 (Maple Leaf) Wing, No. 403 (Sarnia) Wing, and No. 412 (Air Force Club of Windsor) Wing also attended.

The theme stressed throughout all meetings was that the country must always maintain adequate air power for defence and that it was the duty of the Association to continue to make the public aware of the need for supremacy in the air. Senior Air Force Officers and top civilians and

industrial planners were on hand for the sessions, to join with more than 1,500 members of the Association attending the convention.

Among the speakers were Gen. Hoyt S. Vandenburg, Chief of Staff of the U.S. Air Force, who said that America was behind schedule in its Air Force expansion programme while Russia was forging ahead.

The progress made by the Air Force during the past year was reviewed at the annual Airpower Banquet by Hon. Thomas K. Finletter, Secretary of the Air Force, and his remarks were carried on a coast-to-coast radio broadcast. Touching on the war in Korea, Mr. Finletter said it was felt that the Russian-built MIG jet fighters were now being flown by "other than Chinese or Korean pilots."

Seated at the head table at the banquet were Air Vice-Marshal F. R. Miller, C.B.E., Vice-Chief of Air Staff of the R.C.A.F., and Air Vice-Marshal Morfee. Also as honoured guests were American pilots who had become aces in the Korean operation, and many other aviation notables, including four winners of the Congressional Medal of Honour. Awards of the Association for service in the field of aviation during the year were presented at the dinner.

The closing session of the convention was the annual Dawn Patrol Breakfast. Called upon to speak at this affair, Air Vice-Marshal Morfee said that, in the defence of the North American continent, the frontier between Canada and the United States should cease to exist.

At the election of officers, Arthur F. Kelly of Los Angeles, Western Airlines' vice-president (sales), was named president of the A.F.A., succeeding Harold C. Stuart, former Assistant Air Force Secretary.

Other speakers heard at the various sessions included John F. Gordon, vice-president of General Motors; Walter P. Reuther, president of the United Auto Workers; Hon. John F. Floberg, Assistant Secretary for Air of the U.S. Navy; Hon. Karl Bendetson, Under-Secretary of the Army; and Hon. Roswell L. Gilpatrick, Under-Secretary of the Air Force.



Two members of No. 250 Wing's executive (P. F. Connell, left, and D. Wilson, right) check six-year-old Byron Young and his father aboard DC-3 for Sunday afternoon flight.

PUBLIC RELATIONS AWARD

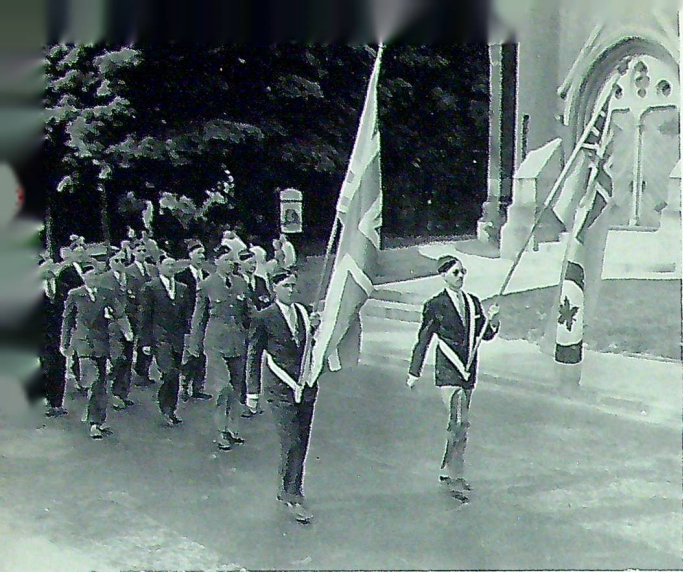
No. 302 (Quebec City) Wing received the current public relations prize. Efforts of Wings engaged on *bon voyage* parties for R.C.A.F. personnel proceeding overseas have been highly praised by A.F.H.Q., with particular reference to Quebec City Wing. Quebec has an active executive, which has been doing a good job in public relations.

AIR-MINDED CITIZENS

While the city was still talking about the air show, No. 250 (Saint John, N.B.) Wing came up with another idea to make the general public air-minded. This was a programme of weekly Sunday flights over the city and district. The 25-minute flights are made in Maritime Central Airways aircraft, and on the first day of operation two full loads were taken up.

In launching the plan, it was felt by the Wing that a number of residents who wanted to take a trip on the day of the air show and could not be accommodated, were still anxious to see the country from the air.

The flights are planned over a two-hour period every Sunday afternoon, with a DC-3 carrying 28



Decoration Day parade of No. 421 (Newmarket) Wing.



Group Capt. J. D. Syme, M.B.E., C.O. of R.C.A.F. Station Camp Borden, takes the salute from No. 421 Wing. A. Elphinstone, Wing president, stands at right of photograph.

passengers on each trip. It is hoped eventually to make four trips during the afternoon with a total of 112 passengers.

On the first day of operations, members of the Wing made the trips with the passengers to supervise safety belts and to act as commentators on the places of interest flown over.

Passengers of all ages were taken on the first

day of the scheme and it is hoped by the Wing that Sunday afternoon flying will become one of Saint John's most popular attractions.

Rates charged were \$2.50 for adults and \$1.25 for children under 12 years of age. Maritime Central Airways gave the Wing all proceeds from the first flight and in the future will pay the Wing 50c. a passenger.

THE MILITARY MIND

Citizens who have misgivings that a military mind unfits its owner to hold a high political office might note these words of Napoleon:

"Since the invention of gunpowder, what have been the most essential qualifications for a military commander? Why, his civil qualities — foresight, power of calculation, administrative ability, ready wit, eloquence (not of the legal kind but the eloquence which appeals to soldiers) and, above all, knowledge of men. All these are civil qualities."

(Philip Parker, in "The New York Times.")

Anniversary and Christening

The first anniversary of the re-entry of women into the R.C.A.F. was celebrated at No. 2 Manning Depot, St. Johns, P.Q., on July 3rd. The occasion was marked by a full-scale ceremonial parade of 300 airwomen, and top-ranking officers from Ottawa, Trenton, and Lachine were present.

While jets whooshed through the sunlight overhead, the Chief of the Air Staff inspected an eighty-girl guard of Honour. Sqn. Ldr. R. S. Davis, one of the Service's most experienced training officers, stated emphatically that he had never seen a better — a statement that should rejoice the hearts of the R.C.A.F.'s 2500-odd women and create an unprecedented demand for C.A.P. 90's among its men.

In his address to the parade, immediately after the inspection, Air Marshal Curtis pointed out that the R.C.A.F. was the first Canadian armed service to recruit women during the war, the last to let them go, and the first to enlist them once more. He also settled (for the time being, at least) the problem that has bewildered the Service since the girls' reappearance in it. He named them.

Because women are no longer enlisted in a Women's Division as such, the old term "W.D." was considered inappropriate. Many great minds



Mrs. W. A. Curtis, wife of the C.A.S., blows out the birthday candle. Behind her are (l. to r.): Pilot Officer T. Hefferman, Group Capt. Webber, and AW J. James.

bent themselves sternly to the task of finding a new name, but nothing completely satisfactory turned up. As of July 3rd., however, the problem is solved. Having reviewed the situation in all its complexity, the C.A.S. said: "I can think of no better short form than the one that gained such distinction during the war, and we will continue to refer to them as 'W.D.'s unless there is a protest." Most people, we feel, will be very well pleased by his solution.

The parade over, the W.D.'s adjourned to their first rebirthday party.

The C.A.S. inspecting the Guard of Honour. Accompanying him are (l. to r.): Group Capt. W. G. Webber, C.O. of the Station; Flying Officer D. Pope, O.C. parade; and Sqn. Ldr. T. J. MacKinnon, D.F.C., aide to C.A.S.

The march-past.



The

ROYAL CANADIAN

AIR CADETS



By Arthur Macdonald

So many important events have taken place since the last Air Cadet story appeared in these pages that we've been scratching our heads to find a way of doing justice to all of them. After considerable thought, it seemed to us that the best way of bringing the Air Cadet scene up to

date was to do it with pictures and what are really little more than "marginal notes".

* * *

Under the impetus of a spirited enrolment campaign, Air Cadet strength figures climbed steadily upwards in 1952. More than twenty new squadrons have been opened this year, to raise the number of active units to 230 and the number of air cadets in Canada to just under 18,000. In printing a picture showing League President H. L. Garner presenting a sparkling new ensign to No. 534 (Peterborough) Squadron, we extend the League's greetings to all of the new squadrons in Canada, and, of course, our best wishes for their future success.

For most squadrons, Number One event of the year is the annual inspection by visiting officers of the R.C.A.F. Annual inspections often provide some tense moments for officers and cadets alike. But they can provide a little fun too—as witnessed by the photo of Kingston air cadets enjoying themselves at a post-inspection party put on by the Kingston Wing of the R.C.A.F. Association. A feature of every annual inspection is the presentation of trophies, and we offer a picture taken in the Regina Armouries as a reminder of that fact.

Out in Vancouver, the biggest Air Cadet story of recent months concerns an "Air Power of the



Mr. H. L. Garner, League president, presents Air Cadet ensign to No. 534 (Peterborough) Squadron.

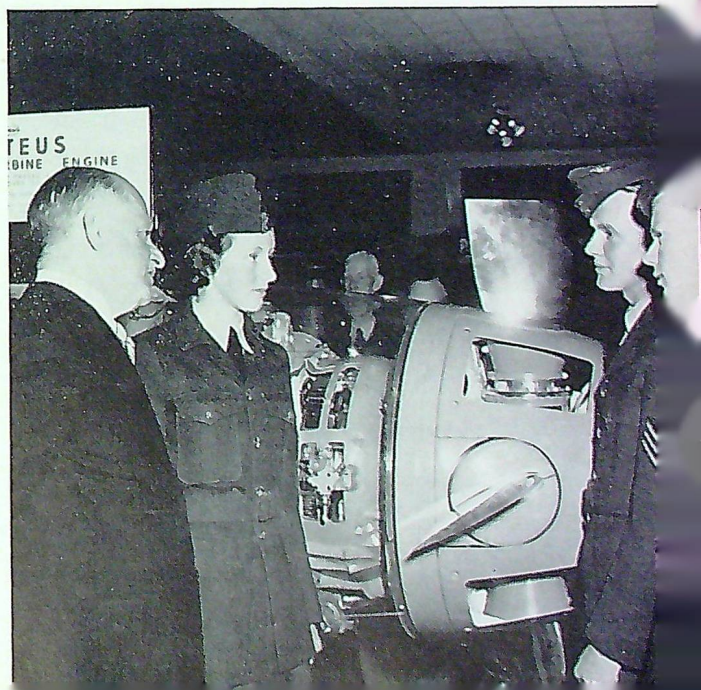


R.C.A.F. high-speed launches, taking overseas cadets for day's outing on Paisley Island, pass beneath Vancouver's famous Lions Gate Bridge.

Future" show put on by the Hudson's Bay Company on behalf of the Air Cadet League. Feature of the show was the Bristol Proteus III turbo-prop engine, a rare example of extraordinary workmanship and design. The Proteus was the main attraction in an outstanding aviation display which served to focus public attention on the Air Cadets. The display was officially opened by Lt.-Governor Clarence Wallace, who stated: "Canada is greatly indebted to her air cadets for their superb contributions to Canadian air power."

Final attendance figures weren't available at press time, but there is no doubt that the Air Cadet summer camp programme has again gone over the top. This year more than 4,000 cadets attended the camps which were held at Greenwood,

The Hon. Clarence Wallace, O.B.E., talks with (l. to r.) Flt. Sgts. Gody and Zacharias and Sgt. Buick of No. 59 (Vancouver) Squadron at the opening of the "Air Power of the Future" show in Vancouver.





U.S. air cadets on the steps of Canada's Parliament Buildings.

N.S., Aylmer, Ont. and Abbotsford, B.C. At the same time, a new flying training record was set when no less than 246 cadets reported to the flying clubs to commence their four weeks' pilot's courses. The majority of these cadets have already obtained private pilot's licences.

Another successful exchange visits operation has been written into the records, with 58 Canadian cadets receiving trips abroad and a similar number of U.S. and overseas lads being entertained in this country. Twenty-six cadets went to the United States, spending most of their time in



Canadian Air Cadets relax on a Florida beach with Miss Sally Wilt, of the Florida Wing of the Civil Air Patrol.



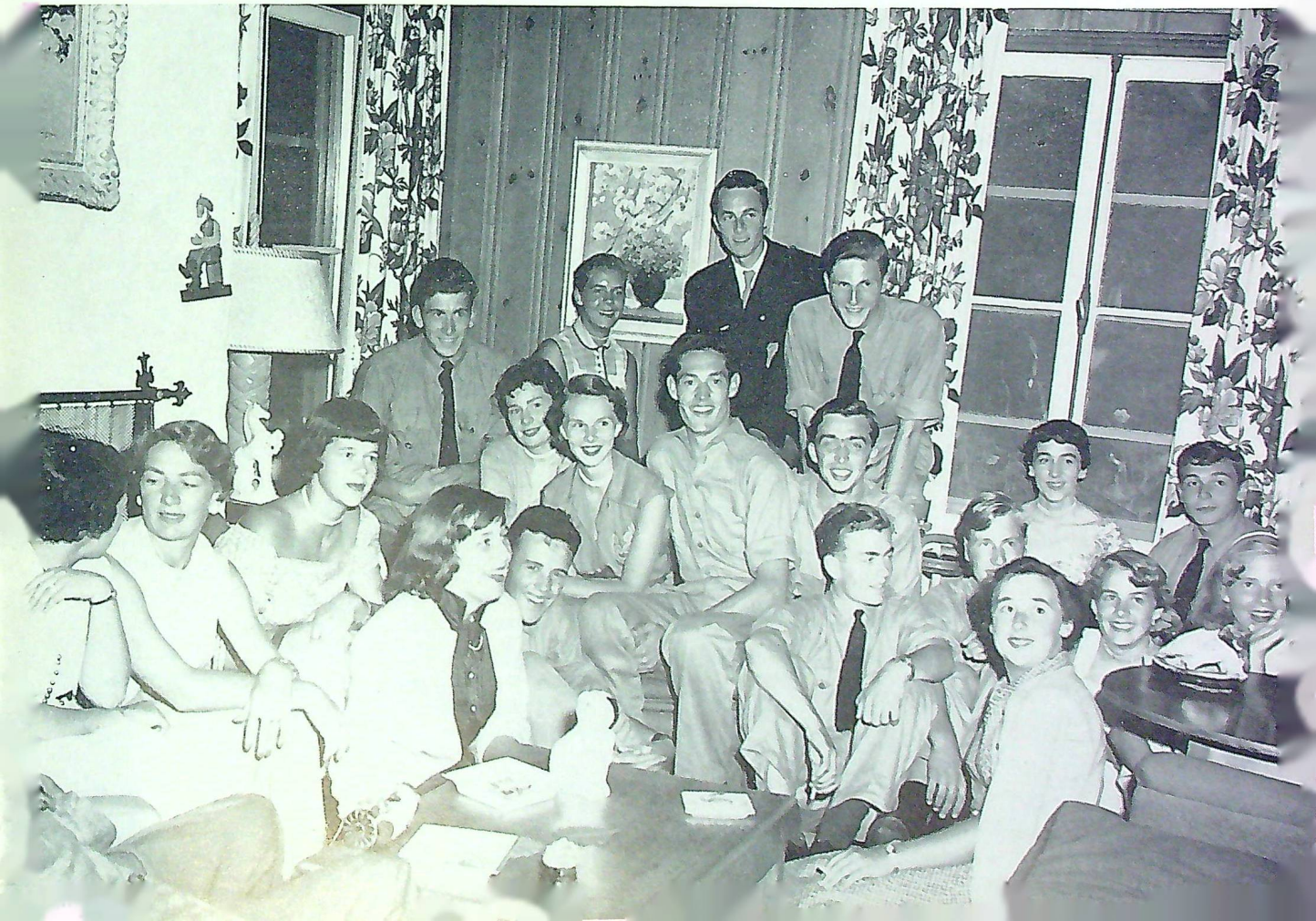
Cadets at the Peterborough plant of the Canadian General Electric Co., during a visit arranged by the Air Cadet Technical Training School at Trenton.

Florida, with visits to New York and Washington thrown in for good measure. The return party of U.S. Civil Air Patrol cadets enjoyed a typical Canadian holiday in Ontario and Quebec.

Meanwhile, 25 cadets travelled throughout the United Kingdom, while another 8 boys visited Norway, Sweden, Holland and Denmark. The overseas exchange cadets had a wonderful time on Canada's west coast and also managed to squeeze in brief visits to Calgary, Winnipeg, and Montreal.

Members of No. 58 (Kingston) Squadron at a party given for them by the Kingston Wing of the R.C.A.F. Association.

European air cadets at Mr. and Mrs. C. Douglas Taylor's summer home at Ste. Agathe, P.Q.





Cadet W.O.1 R. Dickson shakes hands with Lord Alexander at the R.A.F. College at Cranwell.



Brigadier J. A. W. Bennett, Area Commander of Saskatchewan Area, presents the "Don Love Trophy" to Ft. Lt. J. S. Walker, C.O. of No. 41 (Regina) Squadron, which is rated as the best precision drill team in S. Saskatchewan.

An innovation this year was the technical training school for air cadets set up at R.C.A.F. Station Trenton. Fifty cadets took the seven-week course, which was rated one of the most successful ventures ever undertaken by the League and the R.C.A.F. There appears to be little doubt that the technical training course will come to occupy a very important place in the Air Cadet programme.

NOTES ON



(From an article by Brigadier W. J. Lawson, Judge Advocate General, in "The Canadian Bar Review".)

HISTORY OF MILITARY LAW

MILITARY LAW, as we know it to-day, did not exist as a permanent part of the law of England until 1689. Before that date, military law was not enforceable in Britain in time of peace. It was, however, a part of the royal prerogative to issue what were called "Articles of War for the government of His Majesty's forces," but this prerogative could only be exercised in time of war or in respect of troops serving out of the country. It was, therefore, impossible for the King to maintain a standing army in England in time of peace. As soon as the war came to an end or the troops returned to England, the power to discipline the army disappeared. If a man deserted, he could not be punished for his desertion; if he struck a superior officer, he had to be brought before a civil court on a charge of common assault. Under these conditions, it was impossible to keep the army together. It is of interest to note that one of the causes that led to the revolution under Cromwell was the attempt by Charles I to extend the royal prerogative to the issuance of such Articles of War in England in time of peace.

Some of the old Articles of War are extremely interesting, and many of the present provisions of the Army Act of the United Kingdom and of the new Canadian National Defence Act are forecast in them. The earliest Articles of which we have any record are those issued by Richard I to his

Crusaders. Most of the offences dealt with in Richard's Articles are prescribed as offences in the National Defence Act, but the punishments for them are no longer barbarous. For instance, Richard dealt with the serious military offence of stealing from a comrade by providing that, if one of his Crusaders was guilty of this crime, his head was to be shaven and over it was to be poured a pot of boiling pitch. He was then to be put ashore at the next port, where his decorations



would be self-explanatory and would enable him and his crime to be known to all men.

In 1689 the first Mutiny Act was passed. It is only from that date that there existed a permanent code of military law making it possible for the King to maintain a standing army in England in time of peace. In addition to the Mutiny Act, the King could still exercise his prerogative to issue Articles of War. This dual system of military law persisted until 1803, when the royal prerogative was merged into an act of Parliament known as the Army Act, and a system was developed that persists to this day, that is, an act of Parliament governing each of the Services and establishing a code of military law applicable both in peace and war.

A code of law is ineffective unless there are courts charged with the duty of enforcing it. It has therefore been necessary from the earliest times to have military courts to enforce military law. Such a court was first set up at the time of William the Conqueror. It was known as the Court of Chivalry. In addition to administering military law, it had jurisdiction over matters of honour, armorial bearings, and other matters of that nature. Its members were the two highest military officials in the land, the Lord High Constable and the Earl Marshal. The Lord High Constable was the Chief General of the King, equivalent to the Chief of Staff of a modern Service, and the Earl Marshal was the forerunner of the present Adjutant-General. The court came to be known as the Court of the Constable and Marshal, and it is from the Marshal that courts martial derive their name. The Court of Chivalry existed until 1521 when the office of the Lord High Constable was discontinued, its incumbent, the then Duke of Buckingham, having been beheaded by Henry VIII. Subsequently, military law was administered by what might be called a permanent court martial appointed by the King to accompany the army and to administer law each time Articles of War were issued. From this basis our present system of courts martial in the army and air force has been developed.

Naval law goes back to the time of Richard I, who laid down a code of law to govern a fleet

raised by him for a crusade. There was in early times no fixed code of naval law. For each expedition the Lord High Admiral or the Commander-in-Chief issued regulations for the punishment of offences and the maintenance of discipline. These were characterized by the considerable summary powers of commanding officers and the severity of the punishments prescribed. No formal provision seems to have been made for courts martial, but councils of war appear to have been contemplated to advise the commander in connection with serious offences and it is probably out of these bodies that naval courts martial grew. The Royal Navy, as a regular force, dates from the time of Henry VII, but it was not until the Long Parliament that an attempt was made to codify the naval disciplinary system. In 1648 ordinances were enacted authorizing the Lord High Admiral and his Council of War to inflict punishment "according to the Civil Laws, Law Martial and Customs of the Sea." In 1653, provision was made for councils of war of captains or other officers, attended by a judge advocate, to try members of the navy and army at sea who had offended against the Articles of War. In 1661 Articles of War were passed by Parliament laying down a code of laws for the enforcement of discipline in the navy. This Act, for the first time, referred to a naval court as a court martial. The naval code, which had been amended on several occasions since 1661, was consolidated in 1749. In 1880 an Act, which may be considered as the first edition of the present Naval Discipline Act, was passed. This legislation retained the principal features of the 1749 Act, but modified the severity of some of the punishments to conform with the civil law.

When the Royal Air Force was formed at the conclusion of the First World War, the Air Force Act was passed by the British Parliament. It is in practically the same terms as the Army Act and applies to the Royal Air Force the same code of Service law as applies to the army.

Throughout their history, the people of England have taken great care to ensure that the armed services should never take control of the civil government, as has happened so often in other countries. Such care was not considered necessary

in the case of the navy, since it was out of England. The Naval Discipline Act is, therefore, a permanent statute, but Army and Air Force Acts are only in force for one year and, if they were not renewed annually by Parliament, the whole system of military law in the United Kingdom would collapse and the army and air force would disintegrate. The Canadian Parliament did not think it necessary to perpetuate the system of an annual act in The National Defence Act, since modern methods of financial control give Parliament the final word as to the size and composition of the forces. If supply is not voted each year, the forces cannot be maintained, for there would be no money with which to pay the men or purchase supplies. In Canada, therefore, Parliament under the National Defence Act has the same effective control over the forces as has the United Kingdom Parliament under the Army and Air Force Acts.

THE JUDGE ADVOCATE GENERAL

The history of the Office of the Judge Advocate General is interesting in that it illustrates the growth of the military legal system. Articles of War issued in 1639 by Charles I contain the first mention of the Judge Advocate General. They gave the Council of War and the Advocate of the Army authority to inquire into offences committed in the army. Orders issued in 1662 by Charles II gave authority to the "Judge Advocate of the Forces" to take informations and depositions, as occasion should require, in all matters triable before a court martial. After the passing of the Mutiny Act in 1689, the Judge Advocate General acted as legal adviser in all matters to the Commander-in-Chief. He and his deputies advised on the charges and the evidence in cases of difficulty before a court martial was convened. Provision was also made for the attendance of a judge advocate at general courts martial both as a prosecutor and as legal adviser to the court. This combination of duties came to be regarded as undesirable and the judge advocate gradually ceased to act as prosecutor. It was not, however, until 1860 that it was provided that the judge advocate should no longer be the prosecutor. For

over a century before 1893, the Judge Advocate General was a privy councillor, a member of the government and usually a member of parliament. He had direct access to the Sovereign on matters pertaining to his office. In 1893 the office ceased to be a political appointment and from that year until 1905 was held by the President of the Probate, Divorce and Admiralty Division of the High Court. In 1905 it was decided that the office should in future be filled by a person having suitable legal attainments who would be subject to the orders of the Secretary of State for War. In 1948, a further change was made and the Judge Advocate General in the United Kingdom was made responsible to the Lord Chancellor and given largely judicial, as distinct from advisory and administrative, functions.

In Canada, the Judge Advocate General is responsible to the Minister of National Defence and, as well as exercising judicial functions in connection with courts martial in the navy, army and air force, acts as legal adviser to the Department, the three Services and the Defence Research Board. He is assisted by three deputies, one from each service, and a staff of officers stationed in Ottawa and at key centres throughout Canada where, acting for him, they sit as judge advocates on courts martial and advise Service commanders on legal questions.

HISTORY OF DEFENCE LEGISLATION IN CANADA

The first military force organized in Canada was the Canadian Army. It was organized under the Militia Act which was passed by the Parliament of Canada in 1868, the year after Confederation. The present Militia Act is chapter 132 of the revised Statutes of 1927, and it is substantially the same Act as the one enacted in 1868. It has become, because of changed conditions, quite inappropriate as a basis for the organization of the Canadian Army and very little of it has been carried forward, without substantial change, into the National Defence Act.

The first Naval Service Act was passed in 1910, when the Royal Canadian Navy was organized. Under it, discipline was administered pursuant to

the provisions of the Naval Discipline Act of the United Kingdom. It remained the basic statute of the Navy until 1944, when a new Naval Service Act was passed. This Act differs materially from the Militia Act and the Royal Canadian Air Force Act, in that it contains a Canadian disciplinary code for the Navy. The disciplinary codes in force in the United Kingdom Army and Air Force, as embodied in the Army Act and Air Force Act respectively, are applied to the Canadian Army and Royal Canadian Air Force by the Militia Act and the Royal Canadian Air Force Act. The naval disciplinary code embodied in the Naval Service Act was used as the basis for drafting many of the sections of the National Defence Act.

The first legislation dealing with the Royal Canadian Air Force was the Air Board Act of 1919, the title of which was changed in 1927 to the Aeronautics Act. This Act dealt not only with the Royal Canadian Air Force but also with civil aviation. The Aeronautics Act is still on the statute books but the Royal Canadian Air Force is now organized and administered under the Royal Canadian Air Force Act, which was first enacted in 1940.

Until 1922, each Service also had a separate civil administration. The Army was administered by the Department of Militia and Defence, the Navy by the Department of Naval Service, and the Air Force by the Air Board. In 1922, Canada took its first step towards Service unification when the Department of National Defence Act was passed. This Act set up one civil department of government, the Department of National Defence, to administer the three armed services.

Before the enactment of the National Defence Act in 1950, anyone who wished to ascertain the law as it applied to the Canadian forces had to look at no less than six basic statutes: the Militia Act, the Naval Service Act, the Royal Canadian Air Force Act, and the Department of National Defence Act, all acts of the Parliament of Canada, and the Army Act and the Air Force Act of the United Kingdom.

PURPOSE OF THE NATIONAL DEFENCE ACT

The purpose of the National Defence Act was clearly explained by the Honourable Brooke Claxton, Minister of National Defence, when he introduced the Bill in the House of Commons on April 18th, 1950. On that occasion he said:

The purpose of the legislation is far more than simply to consolidate existing defence measures. The purposes are:

- to include in one statute all legislation relating to the Department of National Defence and the Canadian forces;
- to have a single code of Service discipline so that sailors, soldiers and airmen will be subject to the same law;
- to make all legislation applicable to Service personnel Canadian legislation;
- to obtain uniformity in the administration of Service justice;
- to provide a right of appeal from the finding and sentences of courts martial;
- to abolish field general courts martial;
- to provide for a new trial on the discovery of new evidence;
- to provide in the administration of the department more efficient and expeditious means for the transaction of routine business;
- to establish the position and functions of the chiefs of staff;
- to abolish, as obsolete, provisions for levee en masse and enrolment by ballot; and
- to authorize the employment of the regular forces to meet a national disaster, such as a major flood, and to permit the use of reserve forces for these purposes.

CHANGES EFFECTED BY THE ACT

The National Defence Act effects three major changes in Canadian military law. These are:

1. Canada's armed forces will henceforth be governed entirely by Canadian law and not in part by the law of the United Kingdom. In the future, when a Canadian soldier is accused of theft, the charge against him will be framed under the Criminal Code and not under the English Larceny Act, at his trial Canadian and not English rules of evidence will be applied and, if he is convicted, the sentence will be that prescribed by Canadian and not by English law. The National Defence Act provides a single source of statutory law relating to the armed forces and it will no longer be necessary to refer to several Canadian and United Kingdom statutes to ascertain the law.

2. The same code of Service discipline will apply to all Servicemen irrespective of the Service to which they belong or whether they are officers or men. Although in the past the army and air force have been subject to very similar codes, the naval code has differed materially.

Under the National Defence Act only a few minor differences, necessitated by differing conditions of service, remain. The punishments prescribed for officers and men are the same and have been brought into line, so far as practicable, with those prescribed by the Criminal Code.

3. The administration of military law will be subject to review by civilian court of appeal and, in certain circumstances, by the Supreme Court of Canada. Lawyers will appreciate the salutary and far-reaching effect the right of appeal will have on the whole administration of military law.

IT'S AN ALBATREAGLE!

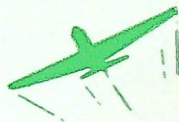
(From "Air Mail," in the United Kingdom, comes a further note on the perennial controversy as to whether the bird on the badges of the Commonwealth's Royal Air Forces is an albatross or an eagle.)

Now comes a charming letter from Maj. G. Raymond Morgan, a well-known Bristol architect, accompanied by the design that was chosen originally by the late Air Cdre. Samson, V.C., with whom he served in the R.F.C. in the First World War.

"I had offered to design a badge, and it was my drawing that was eventually chosen by my old R.F.C. colleague, Air Cdre. Samson. There is no mystery — but there was a lot of fun — attached to the bird itself.

"The air commodore laid down that it must be a creature to span the world, and as he was R.N.A.S. he naturally favoured an albatross. I thought the eagle was more appropriate and sent him a variety of suggestions, showing the bird somewhat 'style-ised'. He sent them back saying that it was important that every feather should be shown, and while I took this with a grain of salt — because it was obviously impossible to do this without achieving a chain-mail effect — I did make exhaustive researches at the Zoo and Museum.

"Air Cdre. Samson was graciously pleased with the result and wrote to say so. My eagle must have looked a pretty good albatross to him. At least I can guarantee that the bird I created did have the average number of primary feathers!"



THE FLYING SAFETY YEAR HOBO BARREL

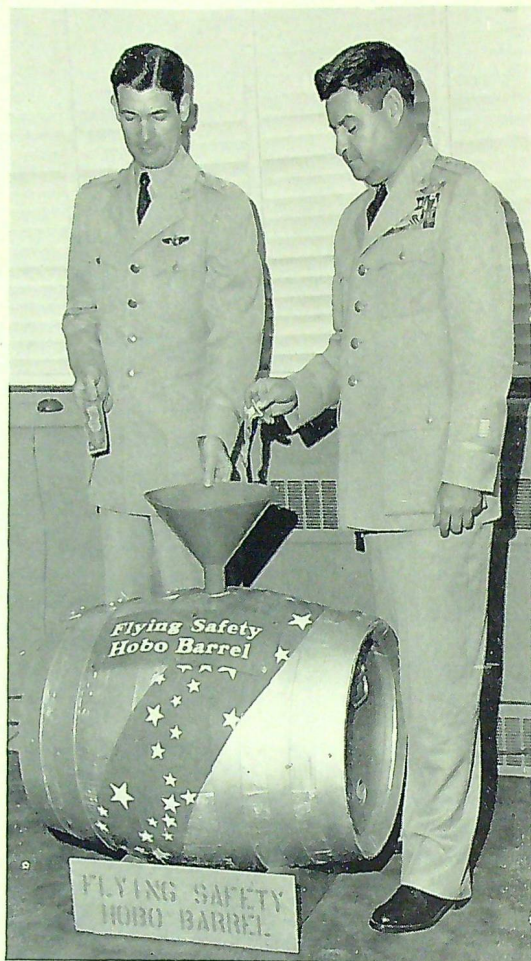
As concrete evidence of his support for the Strategic Air Command's Flying Safety Year campaign, Lt. Gen. Curtis E. LeMay, commanding general, drops the first dollar bill into the Flying Safety Hobo Barrel, the promotional device which will provide an estimated \$1000 prize monthly to the SAC base with the lowest accident rate. Col. Frank W. Ellis, chief of SAC's Flying Safety Division, stands ready to add his contribution.

During September, the barrel was on display receiving contributions at Offutt, March, Fairchild and Travis. It will appear in succession at Castle, Davis-Monthan, Carswell, and Bergstrom during October. To provide a total of \$12,000 for the 12 monthly winners during the year-long campaign will require that SAC's officer personnel donate \$1 each.

To instill competition between bases, the amount collected at each station will be painted on the barrel. The base winning the monthly Flying Safety Year trophy award will receive the \$1000 purse to use for a base-wide party or other activity.

By flying safely and contributing to the Hobo Barrel, officers have the opportunity of seeing their money returned with interest, plus making a vital contribution towards increasing SAC's effectiveness.

(*"Combat Crew": U.S.A.F.*)



BAH! PLUMBERS!!

It has for many years been found extremely difficult to obtain a sufficient supply of intelligent seamen, either for the Navy or the mercantile marine. This is, of course, mainly due to the fact that the substitution of steam as a motive power has tended to make sea-going men engineers rather than sailors.

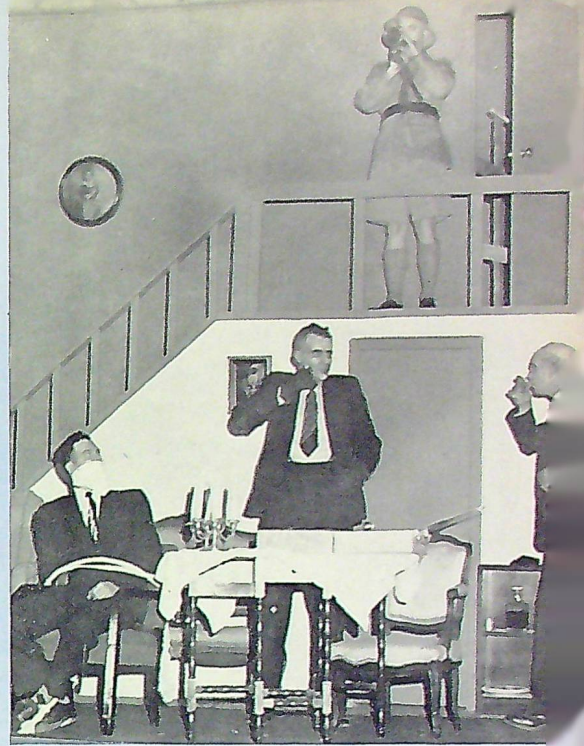
(*"85 Years Ago"—"Army Navy Air Force Journal": U.S.A.*)

Answers to "What's the Score?"

- | | | | |
|---------|---------|---------|---------|
| 1: (a) | 2: (c) | 3: (b) | 4: (d) |
| 5: (a) | 6: (d) | 7: (b) | 8: (a) |
| 9: (c) | 10: (a) | 11: (c) | 12: (d) |
| 13: (b) | 14: (d) | 15: (c) | 16: (a) |
| 17: (d) | 18: (c) | 19: (a) | 20: (b) |

THALIA IN EDMONTON

Not the least impressive of the R.C.A.F.'s activities during the past summer was the presentation at Station Edmonton of "Arsenic & Old Lace." Everyone associated with the production was a resident of the Station or nearby Namao. The performance, which was the first attempt of its kind in the Edmonton area, was so well received that it may be repeated at other Units during the autumn. The play was directed and produced by Pilot Officer H. Munroe.



Capt. Hillier (with bugle), Flt. Lt. Evans (tied up), Sqn. Ldr. Hamilton (left) and Sgt. Smith (holding glasses).



Policemen: Sgt. Byers (left) and Flt. Sgt. Snow. Prisoner: Flt. Lt. Evans. Gunman: Sgt. Saunders.

The cast. Standing (l. to r.): Flt. Lt. J. Evans, LAC J. Dinzey, Flt. Lt. E. Taylor, Sgt. S. Smith, Sgt. T. Byers, Sgt. S. Saunders, Sqn. Ldr. R. Hamilton, Capt. D. Hillier (Dental Officer), Flt. Sgt. J. Snow, Flying Officer L. Scott. Seated (l. to r.): Mrs. R. J. Lane, Mrs. W. Birch, Mrs. R. Tobin. Missing from photograph: Flt. Lt. A. Cameron.



