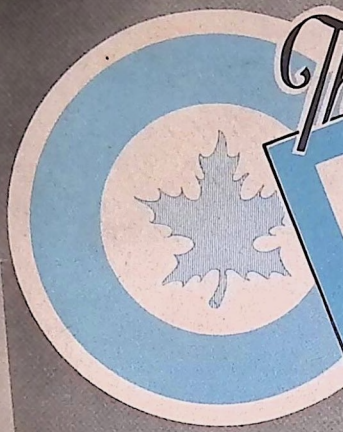


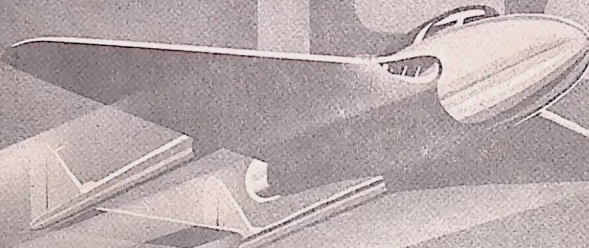
VOL. I, No. 6  
APRIL 1949

*The*

# ROUNDDEL



1949



1924



## SILVER JUBILEE

ROYAL CANADIAN AIR FORCE



Issued on the Authority of  
THE CHIEF OF THE AIR STAFF  
Royal Canadian Air Force

VOL. I, No. 6

APRIL 1949

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## TWO MESSAGES

### A MESSAGE FROM HIS EXCELLENCY, VISCOUNT ALEXANDER OF TUNIS

The Royal Canadian Air Force has attained a remarkable record of progress and achievements during the last quarter century.

It gives me great pleasure to express to all officers and men my sincere congratulations on the occasion of the Silver Jubilee of the Royal Canadian Air Force, and to offer my very best wishes for the future.

*Alexander of Tunis.*  
— J.A. —

### A MESSAGE FROM THE HON. BROOKE CLAXTON, MINISTER OF NATIONAL DEFENCE

ON the 1st of April the Royal Canadian Air Force celebrates twenty-five years of faithful service to the Canadian nation. The RCAF traditions of hard work, great gallantry and devoted sacrifice were founded in the records of Canadian fliers of the First Great War.

In the Second World War the Royal Canadian Air Force wrote a record in the skies that stands unsurpassed. Under RCAF administration the British Commonwealth Air Training Plan was rightly known as an "aerodrome of democracy." Canada furnished more aircrew in proportion to population than any country in the war.

Cherished by all Canadians, the name of the Royal Canadian Air Force stands high wherever people have fought for their freedom.

To all of you whose work in peace and war has stood and stands today for our security, I extend my hand in congratulation on the Silver Jubilee of your Service. Today your work is dedicated to the preservation of peace. Should peace not prevail, you must and will be ready to face the challenge of any emergency.

*Brooke Claxton*

# SHATTERPROOF FIGHTS ON !

EDITOR ROUNDEL  
TRUST YOU PROPOSE FEATURING SILVER JUBILEE IN  
APRIL ISSUE STOP LET US HAVE NO SLACKNESS STOP  
STILL LOBBYING SO CANNOT VISIT YOU  
SHATTERPROOF

SGT SHATTERPROOF  
WILL TRY AVOID SLACKNESS STOP HAVE YOU ANY  
MESSAGE FOR BRASS OR BOYS IN FIELD STOP GOOD LUCK  
EDITOR

EDITOR ROUNDEL  
YES BUT LITERARY ADVISOR LAC BLADDER IS IN  
CUSTODY FOR BITING CO IN CALF STOP THOUGHT HE  
WAS BULL TERRIER STOP GOOD LUCK ABOUT WHAT  
SHATTERPROOF

SGT SHATTERPROOF  
WHO THOUGHT WHOM BULL TERRIER STOP GOOD LUCK  
IN LOBBYING OF COURSE  
EDITOR

EDITOR ROUNDEL  
BLADDER THOUGHT SELF TERRIER AND CO BULL STOP  
BULL TERRIERS LIKE BITING BULLS STOP LOBBYING NOT  
LUCK BUT SCIENCE  
SHATTERPROOF

SGT SHATTERPROOF  
WHY STOP ALSO AGREE  
EDITOR

EDITOR ROUNDEL  
WHY WHAT AND AGREE WITH WHAT STOP YOU MEAN  
WHY BLADDER THINK SELF BULL TERRIER OR WHY  
BULL TERRIERS BITE BULLS STOP BE MORE DEFINITE  
SHATTERPROOF

SGT SHATTERPROOF  
MEAN WHY BLADDER THINK SELF TERRIER STOP AGREE  
LOBBYING IS SCIENCE STOP WISH I COULD DO IT EDITOR

EDITOR ROUNDEL  
BLADDERS FINE MIND UNHINGED BY OVERSTUDYING  
FOR TRADE TEST STOP TOUCH OF CLAUSTROPHOBIA STOP  
DO YOU MEAN YOU WISH YOU COULD THINK SELF BULL  
TERRIER OR WISH YOU COULD BITE BULLS  
SHATTERPROOF

SGT SHATTERPROOF  
NO STOP BULLS PROBABLY TASTE AWFUL STOP MEAN  
I WISH I COULD LOBBY STOP AM GETTING CONFUSED  
STOP PLEASE EXPEDITE MESSAGE STOP YOU MEAN  
HYDROPHOBIA  
EDITOR

EDITOR ROUNDEL  
HOW YOU KNOW WHAT BULLS TASTE LIKE STOP TASTING  
BULLS SHOCKING HABIT FOR EDITOR AND BODES NO  
GOOD FOR ROUNDEL STOP MEAN CLAUSTROPHOBIA  
STOP BLADDER TEETOTALLER AND DOES NOT HATE  
WATER STOP WHAT MESSAGE  
SHATTERPROOF

SGT SHATTERPROOF  
MESSAGE TO BOYS IN FIELD DAMMIT STOP I DONT BITE  
BULLS STOP HAVE YOU GONE OFF YOUR ROCKER TOO  
EDITOR



EDITOR ROUNDEL  
NO BUT IF YOU THINK YOU HAVE SIR SEE MO AT ONCE  
STOP DANGEROUS FOR ROUNDEL IF EDITOR OFF ROCKER  
STOP BEST EDITORS ALWAYS SANE STOP ARE BOYS IN  
FIELD DAMMIT NEW SORT OF AIRMEN OR NEW SORT  
OF FIELD  
SHATTERPROOF

SGT SHATTERPROOF  
I DO NOT BITE BULLS STOP I AM NOT OFF MY ROCKER  
STOP ROUNDEL IS SAFE STOP ALL I WANT IS A MESSAGE  
TO THE USUAL BOYS IN THE USUAL FIELD  
EDITOR

EDITOR ROUNDEL  
AM IN CUSTODY STOP GALLSTONE CLAIMS IMPROPER  
USE OF SIGNALS STOP PLEASE CERTIFY USE WAS IN  
BEST INTERESTS OF SERVICE STOP MUST PAY FOR THIS  
WIRE SO ONLY BRIEF MESSAGE TO BOYS IN FIELD STOP  
IF THEYVE TOUGHED IT OUT TILL SILVER JUBILEE THEY  
CAN TOUGH IT OUT TILL DIAMOND STOP TELL THEM  
SHATTERPROOF WILL FIGHT ON  
SHATTERPROOF

# The First AIR CORPS

by  
WING CDR. F. H. HITCHINS, *RCAF Air Historian*

APRIL IS AN IMPORTANT MONTH in the history of military aviation. The first day of April is the birthday of both the RAF and the RCAF, and the second day of the month marks the 155th anniversary of one of the most significant events in modern history. On April 2, 1794, France's Committee of Public Safety decreed the establishment of what was, in effect, the world's first military air corps.

Shortly before the outbreak of the French Revolution, man had achieved his age-old dream of taking to the air, and within ten years ballooning had become a new vogue in France, England, and America. But hardly had these first pages in the history of aeronautics been written when a new chapter was opened by the outbreak of revolution in the land that had given birth to the balloon.

In 1793 the Revolution in France had reached a climax and a crisis. The infant Republic was confronted by a great hostile coalition of Austria, Prussia, Sardinia, Britain, Spain and Holland, intent upon checking the spread of this revolutionary republican disease. In addition, conservative reactionary groups within the Republic were stirring up insurrections. To meet this menace without and within, the National Convention established an executive body, the Committee of Public Safety, and conscripted the whole nation in defence of the Republic.

The Committee of Public Safety called upon the scientists to bring their talents too to the aid of the Republic by developing better methods of manufacturing munitions and other necessary

supplies. One of these savants, Gaspard Monge, an eminent mathematician, suggested that the balloon, which France had given to the world, might now be used to defend the nation against the world. The Committee welcomed the proposal, and a commission of eight prominent men of science was eventually appointed to make a careful study of the details of the problem. This group requested Jean Marie Joseph Coutelle, a physicist and former colleague of Dr. Charles in his early balloon experiments, to carry out new tests, and for that purpose gave him an old balloon envelope which had been found in the sequestered property of an *émigré*.

As soon as Coutelle had solved the initial problem of how to generate hydrogen on a large scale by passing steam over red-hot iron (since all the sulphur normally used for generating hydrogen by sulphuric acid was needed for the manufacture of gunpowder), the Convention ordered him to the battle-front to consult with Jourdan, the commander in the field. These conferences disclosed



that there was much work yet to be done, and Coutelle returned to his laboratory. New workshops were established at Petit Meudon, just below Paris on the Seine, and here—"the birthplace of military aeronautics"—the experiments were continued by Coutelle and his colleague, Nicolas Jacques Conté, a brilliant and versatile scientist.

On March 29, 1794, Coutelle demonstrated a captive balloon before the commission of the Committee of Public Safety, and four days later the Committee ordered the establishment of a balloon company for active service in the field.

The original strength was fixed at a captain (Coutelle), a sergeant-major, a sergeant, two corporals and twenty men, half of whom were to be skilled in various necessary trades. The uniform was to be blue piped with red, with black collar, cuffs and leggings, and a three-cornered hat. Arms were to be a sabre and two pistols. This dress uniform, however, saw little use: for working clothes, the men wore a plain blue outfit.

After a rapid course of training at Meudon, the little company went to the front to join the French forces in Maubeuge, on the Belgian frontier, then rather loosely besieged by the Austrians and Dutch. After some delay, during which the balloon men had to face the scorn and contempt of the "real" soldiers, their equipment arrived. A brick gas-generating furnace was erected and the balloon was inflated. This aerostat, the "Entreprenant," the first balloon used in war, was about 27 feet in diameter, with 10,300 cubic feet capacity and 570 pounds lift.

Two cords fitted to its equator allowed it to rise to 1,200 feet with two observers in its nacelle.

On June 2nd of the same year the "Entreprenant" rose into the air at Maubeuge, carrying Capt. Coutelle and an engineering officer. The first ascension was quite successful. The two observers discovered that many of the enemy tents were unoccupied and that the besieging forces were not so strong as had been believed. ("Henceforth it will be impossible for the enemy to make a movement without being discovered.") On the other side the Austrians voiced a complaint—often to be repeated in later wars—that they couldn't take a step without being seen. To remove this menace to their privacy, the Austrians placed two cannon in position in a hollow road; and when the balloon next ascended, Coutelle was greeted by two round shot whistling close by. His answer to this was a loud and defiant "Vive la République!" A more effective reply to this first



anti-aircraft battery, however, was to summon an expert gunner to Maubeuge to destroy the enemy pieces. Unfortunately, the Austrians moved their guns before the gunlayer had an opportunity to display his skill.

Meanwhile General Jourdan, the French commander in this sector, was besieging Charleroi, some 25 miles to the north-east down the Sambre River. It was imperative to take the city as quickly as possible, for a relieving army under Prince Coburg was drawing near. To aid in this, it was decided to use the balloon to spy out the state of the town's defenses.



But how was the large gasbag to be transferred from besieged Maubeuge to the besiegers at Charleroi?

The answer to the problem was the boldest feat in the balloon corps' brief life. Under cover of darkness, the fully inflated bag was manhandled over the ramparts and ditches on the unguarded side of Maubeuge and, moving in complete silence



*The Battle of Fleurus (from a contemporary miniature).* to avoid discovery, the little party was well away from the town before daybreak. Day brought a new hazard, the wind; and lest the large silk bag be blown against the trees lining the narrow roads, the balloon party had to take to the open country and tow it across the ploughed fields. At sunset the exhausted men reached their objective, to receive an enthusiastic welcome from the staff and bands of the French forces outside Charleroi.

At dawn the next day, Coutelle and Jourdan's chief of staff, General Morlot, ascended in the "Entrepenant." Altogether they spent eight hours in the air that day in three ascensions, and confirmed the suspicions of the French staff as to the weakness of the town's defenses. Plans were therefore made to attack at once, but the enemy commander, realising it was hopeless to try to conceal any longer his bad situation from opponents equipped with this new means of observation, decided to surrender. A few hours after the fall of Charleroi on June 25th, distant gunfire announced the approach of Coburg's relieving army, and the allied commander sadly told his captors he had not realised succour was so near at hand.



Jourdan immediately faced about to meet the new foe. The French army formed its lines at Fleurus, a few miles to the north-east, and there on June 26th, 1794, one of the most important battles of the Revolutionary War was fought. Coutelle and Morlot again went up in the balloon about dawn. They remained in the air the greater part of the day (nine hours) and kept the commander in constant touch with the developments of the action by means of messages dropped in weighted bags—a method used by aircraft 120 years later.

After a hard-fought battle, the French won; but the exact role which the balloon played on the decisive day is difficult to determine. An eyewitness later denied that it had contributed in any way to the success of the French arms. Coutelle himself refused to claim that "the aerostat won the battle of Fleurus." All branches of the army, he said, had done their duty, and he had merely done his best, in spite of the constant swaying and bobbing of the balloon, to keep the general informed of the movements of the opposing infantry, cavalry, and artillery parks. To a distant observer it would seem that perhaps the most valuable service of the "Entrepenant" was rendered on the days before the battle. Whether or not it contributed directly to the outcome of the operations at Fleurus by hastening the fall of Charleroi, it apparently upset Coburg's tactics the following day and so made possible the French victory.

After the battle of Fleurus the French army advanced northward toward Brussels, with the

balloon making daily ascensions to reconnoitre. Jourdan was much impressed with its usefulness and made a few ascensions himself, as on the occasion of an action at Sombreffe on July 4. Two days later, however, the balloon envelope was badly torn by the wind during a storm and was rendered unserviceable. Since leaving Maubeuge two weeks previously the balloon had received no additional gas, nor had any been required—a remarkable tribute to the quality of the balloon fabric and the care taken by its crew. During the month's service in the field, the bag had been punctured seven times by bullets without appreciable loss of gas before patches were fitted.

After returning to Maubeuge to repair and reinflate the damaged "Entreprenant," Coutelle was in the field again by the middle of September 1794, and he accompanied the army on its march from Liege to Aix-la-Chapelle. Here the year's operations closed and the troops went into winter quarters. The balloon company, assigned to Borcette nearby, rested from its first strenuous campaign and built a new workshop and base for future operations.

In the spring of 1795, Capt. Coutelle returned to Paris to organise a new balloon unit, and Capt. Lhomond succeeded him as commander of the First Company attached to Jourdan's Army of the Sambre-and-Meuse. From this point onward its activities are obscure and few details are available. The company followed the army on its advance across the Rhine and through southern Germany as far as the Nab River in Bavaria. When the French army was defeated at Wurzburg on the Main by the Archduke Charles of Austria, on Sept. 3, 1796, the balloon section and all its equipment fell into the hands of the enemy. Although the prisoners were released seven months later, by the Treaty of Leoben, the company remained completely inactive thereafter. Hoche, Jourdan's successor in command of the army, had had no experience with the balloon in action and was strongly opposed to this "useless encumbrance" in his forces. He therefore asked to be relieved of the burden and his request was granted.

Meanwhile the balloon corps had been expanded. In the fall of 1794 the Committee of Public

Safety organized the establishment at Meudon as the National Aerostatic School under the direction of Conté, with a class of 60 pupils. By March 1795 the first class had completed the course and was formed into the Second Balloon Company under the command of Coutelle. The new section was attached to General Pichegru's Army of the Rhine and saw its first service in the operations connected with the siege of Mainz. A gas furnace and repair shop were set up at Kreuznach, about 20 miles distant, and the inflated balloon was then towed across the devastated area to the besieged city. For several days Coutelle and an engineer officer were occupied in making a complete survey of the defenses of Mainz. On one occasion the wind was so strong that the bag was blown down to earth at the end of its cables and was almost torn from the hands of the



ground crew. Some Austrian officers came out under a flag of truce to ask that the brave aeronaut be ordered to descend lest he lose his life! Before long the wind subsided and Coutelle completed his reconnaissance.

Ascensions were also made at Mannheim farther up the Rhine valley. When that city surrendered in Sept. 1795, the company went into quarters at Frankenthal, about halfway between Worms and Mannheim, set up a base and workshop there and prepared to spend the winter. While the men were resting, Pichegru, soon to be exposed as a traitor, announced plans for a new advance and called the balloon officers into consultation at Mannheim. Before their return, some unknown person fired a charge of buckshot



and nails at the gasbag, wounded the sentinel on guard over it, and so riddled the envelope that it had to be sent back for extensive repairs. Before it could be returned to the field the French army, because of the commander's treachery, had to retire beyond the Rhine, and a new balloon base was established at Kolbseim, near Strasbourg. Coutelle was now promoted to *chef de bataillon* and placed in command of both balloon companies in the field.

In the spring of 1796 General Moreau, Pichegru's successor, began a new advance across the Rhine. The Second Balloon Company again followed the troops on their 150-mile march into Bavaria.

At Donauworth one of the observers had a thrilling ascent in the unballasted balloon, which shot up so rapidly that the ground crew had their palms scorched before they could check its rise. This was its last ascension, for the aerostat, far removed from its base and two months in the field without additional gas, had become flabby and heavy and there was no way of reinflating it while still in the field. There may also have been some difficulty in keeping pace with the rapidly moving army. The balloon was accordingly deflated and carried by car across the Danube to Augsburg in the wake of the French forces.

Soon afterwards Moreau's Army of the Rhine was forced to retreat from southern Germany. The balloon company returned from Augsburg through the Black Forest to its base near Strasbourg, and there its war service came to an end in the fall of 1796. The officers in vain petitioned

their commander to use them again in the field, but even Jourdan, victor of Charleroi and Fleurus, now seemed to have forgotten them, and when a new campaign began the balloons were left behind. After a long period of inactivity the Second Balloon Company was finally dissolved on January 28, 1799.

One final episode remained before the curtain fell on the first balloon corps in history. When victorious General Bonaparte organized his Egyptian expedition early in 1798, Coutelle and Conté were attached to it as members of the corps of scientists. They brought with them the First Balloon Company which Hoche had detached from his army late in 1797, and secured also the pick of the personnel and material from Meudon. Their hopes of adding new laurels to those won in the Belgian



The first army observation balloon (from a sketch by Conté, the first commander of the Meudon balloon school).



and Rhineland campaigns were soon blasted by Nelson's guns at Aboukir Bay. In that disaster all the balloon equipment on board one of the French vessels was destroyed before the aeronauts had an opportunity to demonstrate their military value in the service of the Little Corporal.

On its return from Egypt the First Balloon Company was also dissolved and the balloon corps ceased to exist. The order of dissolution indicated that the Engineer Corps was to take over the work of the School at Meudon, but nothing was done to keep alive the traditions or example of Fleurus. The creation of the balloon corps had been brought about by a group of enthusiastic scientists who had the support of the Committee of Public Safety and the National Convention, but the dissolution of the Convention in 1795

meant the fall from power of these friends of the new military auxiliary. Furthermore, generals who, like Hoche and Bonaparte, had not had first-hand experience of the service that could be rendered by balloons in the field, were inclined to regard them as useless encumbrances upon their armies' freedom of movement. All they saw, in their strategic planning, was the balloon's lack of mobility due to the absence of portable gas generators, and the consequent necessity of towing it about the country, fully inflated, by hand.



*The "Entrepreneur" at the Battle of Fleurus (from an old engraving).*

Thus, all the knowledge and experience gained in the construction and use of military balloons was lost, not to be revived again in France until the Franco-Prussian War in 1870-71.



## FOOTNOTE TO "THE FIRST AIR CORPS"

THE SPORT of balloon ascending has not disappeared. We've received a press release from France, issued by the Haagsche Balloon Club, reporting there are still some ten balloons making regular ascensions and 20 balloon-type aviators maintain an exclusive association. Furthermore, if we read French right, the release claims there are about 500 balloonists in the U.S. Does anyone know them?

*(Courtesy of "Aviation Week")*

**RCAF**

# **SURVIVAL TRAINING SCHOOL**

by **FLT. LT. S. E. ALEXANDER**

AS AIR FORCE OPERATIONS over Canada's unsettled regions become more and more a matter of daily routine and extend ever further into the north, so the need for survival training of Air Force personnel becomes increasingly greater. Death in the wilderness from exposure or hunger, dramatically picturesque though it may appear when versified by Robert Service and others, is one of the least agreeable ways known of entering the hereafter. Starvation, black flies, mosquitoes, cold, disease, and panic—these are some of the enemies by which not a few airmen in Canada have at some time in their careers found themselves confronted after forced landings or crashes. To reduce the threat of such enemies to a minimum is the chief purpose of the RCAF Survival Training School which was established at Fort Nelson, B.C., on December 15, 1948.

Flying Officer R. J. Goodey, late of the RCMP, was appointed as Officer Commanding the School, and the establishment also included two Indian instructors. Plans were made for two-week courses with an intake of sixteen personnel, with a week's interval between each course. It was also decided to make use of Cambridge Bay as a satellite base later in the year.

The first class, composed of sixteen trainees as well as two members of the Winter Experimental Establishment flight and an RAF Medical Officer, Sqn. Ldr. Barwood, began work on January 12th.

On January the 15th, after three days spent in lectures, issue of equipment, etc., the trainees were taken by motor transport to Mile 233, seventy-three miles south of Fort Nelson. From here they started to walk into Klua Lake, about twenty-three miles east of the Alcan Highway.

For the duration of the field training trainees lived on the new "X" ration, supplemented by whatever they could obtain in the country. They were suitably clothed for the bush, and the temperature was 28° below zero. Four groups were formed, each group selecting its own leader.



*Two Indian instructors. Klua Lake landing-strip is shown in background.*

The trek followed an open Indian trail which did not require the use of snowshoes. Camp equipment was carried on toboggans drawn by dogs belonging to the native instructors. Each member of the party bore a pack ranging from 35 to 50 lbs. in weight, and containing rations, sleeping bag, cooking outfit and spare clothes and snowshoes. The game laws of B.C. were strictly followed.

Since the party had not started until 1,600 hrs., the first overnight stop was made only 7 miles out. Camp was pitched in the open, using bush shelters as a protection against falling snow. On the second day about 10 miles were covered, and the party reached Klua Lake in the early afternoon of the 17th.

Camp was established, and for five days (during which time the temperature ranged between 45° and 50° below zero) the trainees experienced all the delights of Far Northern life. Fishing nets were spread beneath the ice and snares were constructed on rabbit runs. As soon



as a landing-strip had been laid, the Fort Nelson Norseman landed according to schedule. Its visit, which was of a precautionary nature, was timely; for on its departure it took with it a member of the party whose knees had become seriously inflamed. The aircraft brought no additional food, and the trainees' "X" Rations were supplemented only by the fruits of their own



Setting fish-nets



*Open camp*

skill—to wit, five fish, one hare, three Canadian Jays, and spruce tea.

On January the 22nd the party began to walk out. It reached Mile 233 in two days, ate largely in the local restaurant, and returned to Fort Nelson by motor transport on the night of the 23rd. The remainder of the course, until January the 26th, was taken up by analysis of the experience

gained and by further discussion of the various points that had not been sufficiently clarified either by lectures or practical training. It is interesting to note that the average loss of weight by members of the course during their trek to Klua Lake and back was approximately eight pounds.

\* \* \*



Everything being taken into consideration, the first Survival Training Course may be regarded as highly successful. As is always the case with first courses of any kind, unforeseen set-backs occurred in the matter of equipment and also of administration. However, steps were immediately taken to prevent their re-occurrence, and those responsible for Survival Training are confident that it will occupy an ever more important place among Air Force curricula.

✓

# DIMENSIONS

# Standardized

# BY WORLD LINES

(Reprinted by courtesy of "Aviation Week")

A WIDE GAP in the practices of world air carriers was bridged when the initial phase of the new plan for standardization of dimensional units as proposed by the International Civil Aviation Organization went into effect on Jan. 1, 1949.

Universal standardization of dimensional units has for some time appeared as an unattainable goal for science and industry. Only recently, the announcement that Great Britain and the United States have standardized the screw threads of nuts and bolts used in these countries, was heralded as a major achievement.

It was, therefore, a highly significant step when ICAO proposed to its 48 member States a 10-year plan under which all dimensions used in today's aerial navigation would become standardized.

As could be expected, the majority of the units appearing in the final ICAO table are in the metric system. The time schedule and units involved appear in the tabulation accompanying this article.

## Plan Details

The problem of dimensional unification was first considered at the Chicago Aviation Conference in 1944. More recently, nations had not been able to accept the original ICAO proposal of May 1947, which was essentially a compromise between the metric system and the foot-pound-second system.

For this reason, the current plan provides five separate tables of units, including the ICAO table, from which each member State is required to select one for use by its ground stations for air-ground communication in international air transport.

Each aircraft will carry conversion tables, but in event of emergency the ground station will transmit information in the units requested by the aircraft's crew.

Two years after the new standard goes into effect, the number of dimensional tables will be reduced to three; after five years, to two; and on January 1, 1959, the ICAO table will be the only one in use.

## Effect of Plan

The impact of the adoption of the ICAO dimensions on the U. S. flag carriers and on certain affected government agencies will not be as great as might appear at first glance.

Changes would be reflected in:

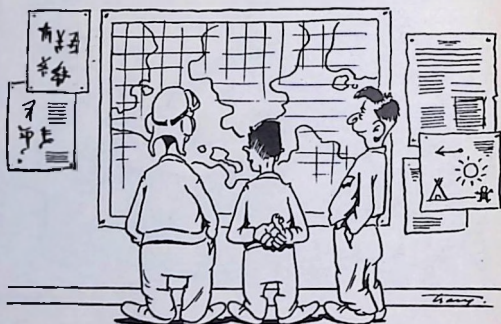
Instrument recalibration.

Dimensions appearing on maps, charts and operational handbooks.

Flight crew training.

Control tower personnel training.

Initially, no instrument recalibration would be required of American international airlines since the Yellow ICAO plan (adopted by U. S. carriers)



utilizes dimensions currently employed on all instruments installed in present-day aircraft.

In the case of converting temperature gauges, a simple replacement of the Fahrenheit scale with one calibrated in centigrade units will suffice.

Airspeed indicators calibrated in knots are already installed in a majority of aircraft flown on international routes, and also on most military aircraft.

With altimeters, although the basic instrument would not be affected, a new gearing mechanism between the bellows and the pointers would be required, as well as a new dial calibrated in metric units. However, since metric altimeters have

already been built in small quantities for the past several years, the manufacturers indicate that the change-over would be relatively simple.

### Change-over Factors

The instrument industry does not believe any difficulty will arise because of the requirement that they supply instruments in both foot-pound-second and metric units. They have indicated their willingness to supply whatever instruments the aircraft industry and airlines require.

It is interesting to note, in this connection, that of the 3646 transport aircraft of principal types in service on the scheduled airlines of the World,

## ICAO DIMENSIONAL STANDARDIZATION

Each State shall select and use one of the following tables of units in messages containing dimensional units transmitted by each aeronautical station under its jurisdiction in the International Telecommunications Service.

Dimensions	Yellow <sup>1</sup>	Red <sup>1</sup>	Green <sup>2</sup>	Blue <sup>3</sup>	ICAO Table of Units <sup>3</sup>
Distances	Statute Miles	Kilometers	Statute miles	Nautical miles & tenths	Nautical miles & tenths
Altitudes, elevations and dimensions on airports and short distances	Feet	Meters	Feet	Feet	Meters
Horizontal speed	Statute miles per hour	Kilometers per hour	Statute miles per hour	Knots	Knots
Vertical speed	Feet per minute	Meters per second	Feet per minute	Feet per minute	Meters per second
Wind direction and wind speed	Degrees & statute miles per hour	Degrees & kilometers per hour	Degrees & statute miles per hour	Degrees & knots	Degrees & knots
Cloud height	Feet	Meters	Feet	Feet	Meters
Visibility	Statute miles (or fractions)	Meters (or kilometers)	Statute miles (or fractions)	Nautical miles (or yards)	Meters (or kilometers)
Altimeter setting	Inches of mercury	Millibars	Millibars	Millibars	Millibars
Temperature	Centigrade	Centigrade	Centigrade	Centigrade	Centigrade
Weight	Pounds	Kilograms	Pounds	Pounds	Kilograms
Time	24 hours, the day beginning at midnight Greenwich mean time	24 hours, the day beginning at midnight Greenwich mean time	24 hours, the day beginning at midnight Greenwich mean time	24 hours, the day beginning at midnight Greenwich mean time	24 hours, the day beginning at midnight Greenwich mean time

### PROPOSED TIME SCHEDULE

<sup>1</sup>Tables YELLOW and RED are not to be employed after Jan. 1, 1951.

<sup>2</sup>Table GREEN is not to be employed after Jan. 1, 1954.

<sup>3</sup>Table BLUE and ICAO Table of Units may be used until Jan. 1, 1959. After that date, ICAO Table of Units is the only dimensional system to be used.

slightly less than one-third are operated domestically in the U.S.

With respect to Coast and Geodetic charts and maps, it would appear feasible at the outset to overprint the new dimensions on the charts until such time as it becomes practical to reprint them entirely, using the ICAO dimensions.

### Personnel Considerations

Eventual indoctrination of flight crews in the metric system will present more of a problem to the U. S. international carriers than to the foreign, to most of whom system is native.

Nonetheless, as was proven during the war, persons familiar with the American system only, will be able to acquaint themselves with metric units in a matter of two or three weeks if provided proper instruction; therefore this facet of the problem will resolve itself without undue difficulty.

The question of re-orienting control tower personnel is even less complicated since, again, most foreign operators will be conversant with the metric system. The only American personnel affected would be those at the relatively few fields served by the international carriers.



Practical advantages of the institution of a standard set of dimensional units, such as the elimination of confusion between air and ground crews; the undeniable increase in operational safety, especially under emergency conditions; and the obviously desirable fact of universal standardization would seem to outweigh, by far, any temporary inconveniences and financial outlays required to put this proposal into effect.—

*George L. Christian III.*



### THE WATERSPOUT HAZARD

WATERSPOUTS, writes A. H. Gordon in the November issue of the "Meteorological Magazine," may have been responsible for the occasional inexplicable disappearances of aircraft at sea, especially at night in tropical and subtropical regions. They cannot be seen in the dark and are probably too small to give a radar echo. Even in temperate latitudes the rotational velocity of a spout of moderate intensity may reach 100-200 knots, so the more violent ones nearer the Equator should be quite capable of breaking up the strongest aircraft in a few seconds.

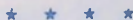
The phenomena are usually found beneath the bases of cumulo-nimbus, where captains of aircraft are accustomed to fly with the idea of avoiding trouble; but, unlike the turbulence within the cloud above, that of a waterspout would be encountered so suddenly as to give no time for a warning to be sent out. The solid wall of water at the bottom of the spout is, Mr. Gordon says, probably too low to be hit, but the spray cascade has been known to rise to 400 ft.

*(Courtesy of "The Aeroplane")*

# the guinea pig club



by GROUP CAPTAIN A. ROSS TILLEY, O.B.E., M.D.



*"Though at first kept in Europe as a pet, the Guinea Pig is now used extensively for experimental purposes."  
Encyclopaedia.*

THE GUINEA PIG CLUB is a unique organization. No one has ever tried to qualify for membership. No one, properly qualified, has ever been rejected. All are life members without the payment of dues, eligibility for membership being considered a sufficient fee. However, the means by which eligibility for membership in the Club was attained are not recommended for general adoption. The following two brief stories will show why.

A Wellington, carrying a 2000-pounder, had made its bombing run over the German ships at Brest. The bomb release button was pushed, but nothing happened. Despite the carrying out of all the manoeuvres appropriate in such circumstances, the egg refused to be laid. Thereupon, for no known reason, the "Wimpy" was headed back to England and arrived over its home station. When the station was informed of what was hanging loose overhead, the crew of the "Wimpy" were told to get the hell out of there, return to the coast, set the controls for any place East, and bail out. On the way to the coast the plane gave a sudden lift; but still the crew were reluctant to land. (It was later found that the bomb had dropped in a field, causing no damage.) Finally, the "Wimpy" crashed near Exeter—and two more fliers, after being treated at the Queen Victoria hospital, East Grinstead, had qualified as Guinea Pigs.

Again, a Canadian was rescued from his crashed Wellington by Arabs, about a week before the Allied landing in North Africa. He was badly burned, and the Arabs treated his burns by liberal applications of that old Arabic nostrum, cow dung. Two days later they handed him over to the Vichy French. He was taken by the Free French some weeks later, sent to Gibraltar, and thence via the Royal Navy to Bristol. There he was forwarded to an American hospital, to arrive two months later at the Queen Victoria hospital. Another Guinea Pig was in the making.

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In order to give the complete story of the Guinea Pig Club it is necessary to take a brief glance at the medical organization of Britain during the War.

In the Spring of 1939 British authorities realized that War with Germany was almost inevitable. They also realized that the expected large-scale air raids would create medical and surgical problems of a quite unprecedented nature. A scheme for emergency medical service was created and the country divided into Regions, each with a complete establishment of specialized Units—Orthopaedic, Head Injury, Maxillo-Facial. The last-mentioned type of Units were later known as Plastic Surgery and Jaw Injury Centres.

## The Roundel

One of the Plastic Surgery and Jaw Injury Centres was located at the Queen Victoria Hospital, East Grinstead. It was directed by Sir Archibald H. McIndoe, C.B.E., M.S., M. Sc., F.R.C.S., F.A.C.S., who was and still is consultant in Plastic Surgery to the Royal Air Force. Accommodation was provided in the Centre for 95 bed and 70 convalescent cases. The Centre was required to treat anyone, either Air Force or civilian, whose injuries required plastic surgery or dental care.

Royal Air Force medical personnel were attached to assist in administration and the care of Air

Force patients. After War was declared, the number of cases soon exceeded all expectations. Burns Centres were then established in RAF Hospitals at Halton, Ely, Rauceby, and Cosford. These centres were staffed by RAF Medical Officers, nurses, and orderlies trained at East Grinstead. All burns cases in these Regions received early treatment at the Burns Centres, but the majority of the more serious cases were transferred to East Grinstead for long-term repair.

Allied aircrew requiring this form of specialized treatment were handled at East Grinstead from the earliest days. In January, 1942, the author,



*Dinner in Toronto, 1948. The two foremost figures facing camera are (left) Sir Archibald McIndoe and (right) the author.*

an RCAF plastic surgeon, was attached to this Centre. In May 1942, the RCAF Plastic Surgery and Jaw Injury Unit was formed there. After the establishment of this Unit a directive required that all RCAF casualties of this type be sent to East Grinstead. By 1943 the number of Canadians under treatment became so large that the Canadian Government decided to construct a Canadian wing of 50 beds. The new wing was staffed by RCAF personnel. After the war, in September 1945, it was given to the Queen Victoria Hospital at a ceremony in which the Acting High Commissioner for Canada, Mr. Hudd, and Air Marshal G. O. Johnson, C.B., M.C., represented the Dominion Government.

During the War over 4,000 burn cases (the majority of them being Allied aircrew) were treated by the four RAF Burns Centres and at East Grinstead. Other types of injuries, such as crushed faces, gun-shot wounds, lacerations, etc., furnished approximately 30 to 40% of the total number of casualties treated at these centres. Aircrew casualties who were treated at East Grinstead for any of the above-mentioned types of injury comprise the membership of the Guinea Pig Club.

\* \* \*

The Battle of Britain produced not only an unequalled record of gallantry but also a by-product of burned and injured aircrew. They came by ones and twos to the Queen Victoria Hospital. They were all accommodated in Ward III, for most of them suffered from a new type of injury—"Airman's Burn."

Burns, of course, have been very common since man first learned to use fire. Other eras have produced specific types of burns, e.g., those resulting from the "Auto da fê" during the period of the Spanish Inquisition. (These did not require treatment.) But the Airman's Burn was typical of the late War. It was a flash burn of the face and hands, caused by intense dry heat, and those who were exposed to this heat for more than a few seconds had no need of treatment. However, the many who did survive, with severely burned faces and hands, came to Ward III. The job of restoring these burned faces and hands took a



*The first stage of recovery.*

long time, sometimes over five years. Anywhere from five to forty operations were required.

*It should be pointed out, for future guidance, that if these burned members of Ward III had worn their issued equipment, the number of severe burns would have been tremendously reduced. There was not one instance in which a major re-build job of the face, or extensive work on the hands, was required when helmet, goggles, oxygen mask, and gloves had been worn. There were several instances in which third degree burns of the hands occurred through holes in gloves, the unexposed remainder of the hand being either untouched or having only a minor first degree burn. Of course, if the exposure to heat had been of sufficient duration for the above safety equipment to have been burned through, no treatment at all was required.*

When the summer of 1941 came around, it became apparent that something quite out of the ordinary hospital spirit was developing in Ward III. The reasons were many. The most important, of course, was the indomitable courage of the patients. They were all aircrew and had experienced similar training and operational (both flying and surgical) procedures. The majority of the patients had been burned. Those who came in

newly burned could see the improvement that had already taken place in others similarly injured. There was a spirit of hope and camaraderie that has seldom, if ever, been equalled. They all wanted to get back in the air—and over 80% did, in fact, return to flying duty.

It was very advantageous that the Centre was not part of a large General Hospital. There was no need for the usual strict (and essential) discipline, and the patients were encouraged to be out of the Centre as much as possible—their condition permitting. Hospital blues and red ties, beloved of the Service's Hospital Administrators, were not worn. This concession was won only after long drawn-out argument and the cutting of much red tape. The authorities finally agreed that these men were entitled to wear their uniform and needed no other distinguishing marks than those provided by their injuries. A few sets of blues were kept on hand for disciplinary purposes. To be the sole wearer of blues had a very dampening effect on excessive exuberance. They were only required on two or three occasions.

The location of the Centre also played a very important part in the development of the Ward III spirit. Throughout the War, from the Battle of Britain and on through the period of the VI's and V2's, a good deal of air activity was seen around East Grinstead. This served as a constant reminder of what was going on in the world, and stimulated in the patients a desire to recover sufficiently to get back in the battle again. The RAF fighter pilot who was shot down with 1½ German planes to his credit, illustrates this point very well. His face and hands had been badly burned, but after fourteen operations he was fit to return to duty. His main desire was to shoot down one German plane for each operation. His final record was 13½ enemy planes, plus the D.S.O., D.F.C. and Bar. Unfortunately, while he was amassing this total he had further difficulties with the enemy and four more operations, so he never quite achieved his objective.

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The town of East Grinstead, after the initial stage of shock at the appearance of so many maimed and disfigured airmen on its streets,

opened its hearts and its homes to all of them. This acceptance was a tremendously important factor in the recovery of the burned men. The ability and facility to mingle freely with other normal people could only be attained in a locality small enough for its inhabitants to become accustomed to somewhat bizarre sights. It is greatly to the credit of East Grinstead that it so fully achieved the right attitude.

There were three well-defined stages in the recovery of a patient. The first was that during which illness, suffering, and worry about their eventual appearance predominated. This first stage lasted only until other similarly injured men, but in a more advanced state of repair, could inveigle them to leave the hospital grounds and visit the town. Once they were convinced that they were still acceptable members of society, the second stage began. Then trips to the cinema or the pubs would be undertaken, firstly in groups, later solo. The third stage was reached when they made trips to London. These were arranged once or twice a week. Theatres would provide tickets and the entertainers would invite their visitors back-stage for tea or other beverages. When the time came for solo trips to London, mental rehabilitation was complete.

A very active Welfare Committee arranged for these visits to London and also for entertainment in the wards to be given frequently by outstanding stage and screen stars, pianists, etc. This Committee also aided both the patients and their families in other ways. It was composed of local civilians and a few members of the Hospital staff. It co-operated closely with the Guinea Pig Club and contributed greatly to its success.

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It was inevitable that a group of men of such spirit, living together under such circumstances for long periods of time, would evolve some means of continuing their association. A start was made on July 20th, 1941. A group of aircrew patients were sitting about recovering either from operations or the night before. Someone suggested that a Club should be formed. It was unanimously agreed that this was a good idea. The name first selected for the Club was "the Maxillonian," as



Guinea Pig Club Dinner, 1945

they were patients in what was then known as the Maxillo-Facial Unit. One who was recovering from his tenth operation remarked that they were just a "plastic surgeon's guinea pigs." The name "Maxillonian" survived only a short time before it was changed to the "Guinea Pig Club" by unanimous wish of the founders.

Today, the aims and objects of the Club remain unchanged. They are as follows:

1. To ensure the continuation of the association begun at East Grinstead.
2. To ensure the existence of an organization that can, if need be, focus the attention of responsible bodies on the needs of injured aircrew.
3. To provide machinery which will assist less fortunate Guinea Pigs in their Service life and their readjustment to Civilian life.

4. To maintain contact between all members, whether still in the Service or returned to Civilian life.
5. To maintain interest in the progress of fellow-members and in East Grinstead by means of a publication, "The Guinea Pig News Letter."
6. To hold an Annual Reunion at which members can foregather and recapture the spirit of Ward III.

The membership is divided into three classes:

1. *Guinea Pigs*. All allied aircrew personnel injured in the course of duty and treated at East Grinstead.
2. *Scientific Section*. The Surgical and other medical types who have ministered to Guinea Pigs.
3. *Friends of Guinea Pigs*. Humanitarian individuals who are interested in the welfare of, and the prevention of cruelty to, Guinea Pigs. This interest is usually expected to take a monetary form.

There is no accurate record of members of the second and third classes. The real Guinea Pigs

number approximately 590 and belong to the following sixteen nationalities:

British . . . . .	325	Belgian . . . . .	1
Canadian . . . . .	170	Dutch . . . . .	2
Australian . . . . .	35	Argentinian . . . . .	1
New Zealand . . . . .	13	Russian . . . . .	1
South African . . . . .	4	Norwegian . . . . .	1
Polish . . . . .	12	Greek . . . . .	1
Czechoslovakian . . . . .	5	American . . . . .	9
French . . . . .	7	Rhodesian . . . . .	2

The method of administration of the Club has altered considerably in the course of time. The first Secretary was a patient with badly burned hands. The first Treasurer was chosen because he had badly burned feet and legs, thus being unable to abscond with the funds. Despite the obvious merits of this kind of executive officer, however, it was soon found that there were some disadvantages: Guinea Pigs were too transient for efficient executive work. Therefore a permanent unpaid part-time executive has been decided upon. It consists of:

*The President—Sir Archibald McIndoe*, unanimously elected Life President.

*The Honorary Resettlement Secretary—Mr. E. J. Blacksell*. He deals with pension resettlement and rehabilitation problems and makes certain "that there is a niche somewhere for every Guinea Pig to work as a productive member of society."

*The Honorary Organizing Secretary—Mr. Bernard Arch*. His duties are to supervise the internal management of the Club, and to maintain and develop the interest of the Friends of Guinea Pigs.

*The Honorary Treasurer—Mr. Alfred Wagg*, who strives to maintain a satisfactory balance between income and outgo.

*The Editor—Mr. Henry Standen*, a Guinea Pig who produces the quarterly issue of the "Guinea Pig News Letter" and even contributes some of his own cartoons. This publication serves as excellent means for communicating Club news and is sent to every member of every nationality, whose address is on record.

*A Guinea Pig Committee*—elected at the annual meeting.

*A Co-ordinating Committee*—formed by representatives from the RAF Benevolent Fund, The British Red Cross Society, RAF Personnel Branch, and the Club. In the past year some £9,747 were expended for the benefit of 35 members through this Committee.

The annual reunion is the high point in the year's activities. This is always held on a Saturday, for very obvious recuperative reasons. The annual meeting and election of committees is held at noon. Then each member's medical record is brought up-to-date and any further surgical work which may be required is arranged for. Each

member's progress in the more mundane things is examined and arrangements are made to provide any necessary assistance. These preliminaries over, the members then proceed to the main event—the dinner.

The dinner has been held annually since 1941 at the Whitehall restaurant in East Grinstead. The only exception was when the Whitehall was being rebuilt after suffering the effects of two bombs during the War. Then the dinner was held in London. Bill Gardner, who is prominent as a Friend of Guinea Pigs, is the manager of the Whitehall. He puts forth his best efforts to see that the affair is a success. So far he has never failed.

The list of guests of honour who have attended is most impressive, including most of the top brass of the RCAF and RAF. Speeches are always short and usually of a type which require libations. This seems to set a happy precedent, and the rest of the evening is of a reasonably convivial nature. The average attendance is about 225 Guinea Pigs, plus many guests. Weather reports on the following day always show a pronounced depression in the East Grinstead district.

\* \* \*

It has been the earnest desire of the RCAF Guinea Pigs to organize an active Canadian Wing. This presents many obstacles due to the great distances in Canada, or, as one might describe it, the sparseness of the Guinea Pig per square mile. However, in November 1948 an organizational dinner was held at RCAF Station, Toronto, and a committee set up. The dinner was held on short notice, during the visit of the Life President, Sir Archibald McIndoe, but the attendance was surprisingly good. The interest of the RCAF in the Club was strikingly shown by the very welcome presence of the Chief of the Air Staff, Air Marshal W. A. Curtis, C.B., C.B.E., D.S.C., E.D., and of Air Marshal G. O. Johnson, C.B., M.C., and many other Air Force officers.

It is hoped that a reunion of all Canadian Guinea Pigs will be possible in the near future, and that a permanent organization will be created. It is intended to follow as closely as possible the

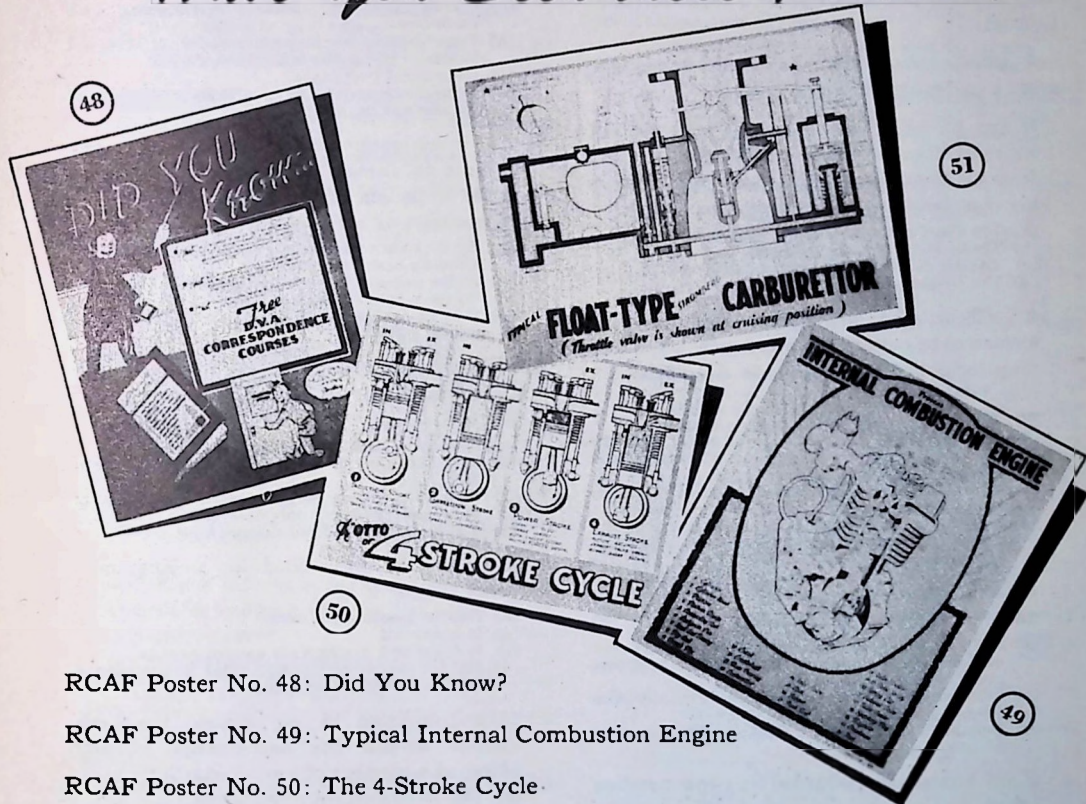
ideas and ideals of the parent organization. Close liaison with the RCAF, the RCAF Benevolent Fund, the RCAF Association, the Canadian Red Cross and other bodies, is essential. It is inevitable that assistance for some of the less fortunate members will occasionally be required. This assistance can best be obtained under the auspices of a recognized organization.

In closing, the author would like to draw attention to another extract from the Encyclopaedia quoted at the beginning of this article:

*"The domesticated Guinea Pig is exceedingly prolific."*

It is a pleasant thought.

## Have You Seen these Posters?



RCAF Poster No. 48: Did You Know?

RCAF Poster No. 49: Typical Internal Combustion Engine

RCAF Poster No. 50: The 4-Stroke Cycle

RCAF Poster No. 51: Float Type Stromberg Carburettor

**ORDER WHAT YOU NEED FROM YOUR SUPPLY SECTION**



# WHAT'S THE SCORE

*(The answers given to the following questionnaire may not be quoted as an authority in any Service proceedings of a legal nature. —Editor).*

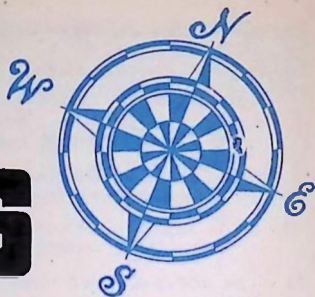
A score of more than 15 is above average. Correct answers are shown on page 48.

1. If any officer or airman who thinks himself wronged does not receive satisfactory redress from his Commanding Officer, he may submit his complaint in writing direct to:
  - (a) The Chief of the Air Staff
  - (b) The M.P. for his constituency
  - (c) The Air or other officer commanding
  - (d) The clergyman of his parish
2. An officer who has caused any officer or airman to be detained in arrest or confinement may incur liability under the Air Force Act if he fails to:
  - (a) Take a statement from the person in custody
  - (b) Investigate the charge within 48 hours after the committal of the person to custody (Sundays, Good Friday and Christmas Day excepted)
  - (c) Ascertain if the person was intoxicated and/or in the company of a lady when taken into custody
  - (d) Investigate the charge against the person within 24 hours after committal to custody (after-duty hours excepted)
3. An aircraftman who is drunk shall be placed under close arrest and shall be:
  - (a) Visited and his condition ascertained at least once each hour for the first three hours, and at least once every two hours thereafter
  - (b) Subjected to a blood test to ascertain his condition
  - (c) Required to sign an abstainer's pledge
  - (d) Required to walk along a chalked line to ascertain his condition
4. If any punishment awarded by a commanding officer appears to a superior officer to be wholly illegal, such superior officer shall:
  - (a) Promote the accused
  - (b) Demote the commanding officer
  - (c) Direct that a second hearing be convened
  - (d) Direct that the award be cancelled
5. A defaulter confined to camp shall be:
  - (a) Committed to hard labour during the period of his confinement
  - (b) Required to answer his name at uncertain hours and to attend all parades and regular duties
  - (c) Ostracised by all ranks
  - (d) Required to sleep in the guard house and attend all parades and regular duties
6. The investigation and disposition of a charge against an airman for an offence committed while a patient in a service hospital shall be made:
  - (a) By the commanding officer of the hospital when the airman's health permits
  - (b) At the patient's bed-side by the Station Chaplain
  - (c) By the hospital Provost-Martial
  - (d) Only by the commanding officer in presence of the patient's wife
7. No statement or evidence by an accused can be admitted as evidence during a court-martial unless:
  - (a) He has first been subjected to a lie-detector test
  - (b) Such statement or evidence has been given under oath
  - (c) Such statement or evidence was given only after the accused had been duly cautioned
  - (d) The accused has refused to enter a plea
8. An officer is disqualified for serving on a court-martial if he:
  - (a) Has not passed grade nine
  - (b) Is unmarried
  - (c) Is of the unit to which the accused belongs
  - (d) Has not already participated in the investigation of the charge against the accused
9. If an objection by an accused has been allowed against the participation of any officer as a member of a court-martial:
  - (a) That officer must retire from the court
  - (b) The opinions of that officer must be taken with reservations during the proceedings of the court
  - (c) The proceedings against the accused must be cancelled forthwith
  - (d) The opinions of that officer must only be accepted if they have been given under oath after consultation with the accused's next-of-kin

10. During a court-martial, the oath must be administered:
- By the padre
  - In accordance with the traditions of the Church of England
  - In such form as the person to be sworn declares to be according to his religion, or binding on his conscience
  - In accordance with the tenets of the Holy Bible (King James' version)
11. The accused, when required to plead to any charge, may:
- Turn the other cheek
  - Express his opinion of the general proceedings
  - Be compelled to enter a plea
  - Object to the charge on the grounds that it does not disclose an offence
12. If the accused refuses to enter a plea:
- A plea of "Not Guilty" shall be recorded against the charge
  - He shall be remanded for surveillance by a psychiatrist
  - A plea of "Guilty" shall be recorded against the charge
  - A further charge under the Air Force Act shall be laid against the accused
13. An officer investigating a charge shall not consult or examine the conduct sheet of an accused unless:
- The accused has a reputation as a continual offender
  - The accused has pleaded guilty, or until the officer is satisfied that the accused is guilty
  - There are no other means of ascertaining the character of the accused prior to conviction
  - The accused pleads "Not Guilty"
14. Every charge against an officer or airman shall be:
- Heard in the presence of the accused
  - Discussed by the superiors of the accused prior to his arraignment
  - Heard only if it has first been ascertained that the accused is guilty
  - Heard in camera
15. When an accused has pleaded guilty before a subordinate commander, and is remanded by him to the commanding officer:
- The plea will be entered on the charge report, and the accused is bound by such plea when he appears before the commanding officer
  - The accused may be regarded as a sucker, and therefore, ipso facto, as guilty
  - He may alter his plea when he appears before the commanding officer, although the original plea may be used against him
  - The plea will not be entered on the charge report, and the accused is not bound by such plea when he appears before the commanding officer
16. An accused person:
- Is not entitled to call witnesses in his defence
  - May be compelled to call certain witnesses, excluding the Station Chaplain
  - May call only those witnesses that the president of the court deems desirable
  - May call those witnesses that can reasonably be procured
17. An officer who is under open arrest shall not appear outside his quarters unless:
- He is taking his meals
  - He is accompanied by an escort
  - He is properly manacled
  - He is dressed in uniform
18. An officer or airman acquitted or convicted of an offence by a civil court:
- May be tried summarily for the same offence
  - Is a martyr to the cause of free thought
  - May not be tried summarily or by court-martial for the same offence
  - May be tried by court-martial for the same offence
19. During a court-martial, a chaplain in the Service may:
- Act as counsel for the accused
  - Assist the accused as he sees fit
  - Assist in the prosecution of the accused
  - Only maintain complete impartiality
20. An officer is not eligible to serve on a district court-martial unless he has held a commission for:
- Five years
  - A reasonable period
  - A period subject to the discretion of the convening authority
  - Two years
- (The foregoing questionnaire is contributed by F/O M.A. East)



# Northern SKYTRAILS



PART VI

by FLT. LT. E. P. WOOD, D.F.C.

## THE RCAF IN THE SUB-ARCTIC: 1927-1939 (Continued)

Group Captain S. W. Coleman

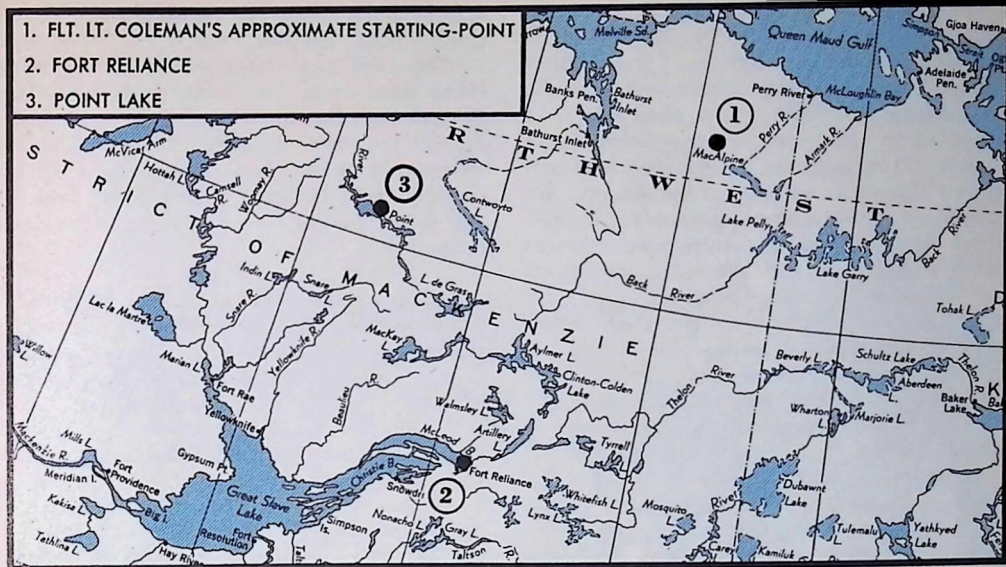
IN AUGUST 1936 a Fairchild aircraft, with Flt. Lt. S. W. Coleman as pilot and LAC J. Fortey as crewman, left Winnipeg to deliver an engine to one of the aircraft carrying out photographic operations in the North West Territories. His mission accomplished, Coleman took off for Fort

Reliance, his intended first stop on the return journey. Four days later, on August 21st, it was discovered that he had not reached his destination.

Search parties were immediately organized. Supply bases were established and thousands of gallons of gasoline were flown in. Six RCAF aircraft were withdrawn from photographic operations in the area to concentrate on the search. In addition, two commercial aircraft were chartered to assist. Mechanics were flown in to service the aircraft. Captain Hunter, the medical officer from Military District No. 13, Calgary, was made available in



Site of Franklin Expedition headquarters (Fort Reliance)



case his services should be required. Mr. Eric Fry, Topographical Surveys Branch, who was in the vicinity at the time, acted as navigator for the fliers and plotted routes to be flown. Squadron Leader L. F. Stevenson, who was Commanding Officer at Vancouver, was detailed to take charge of the search, making his Headquarters at Fort Reliance.

Day after day for nearly a month the search went on, without success. Then, on September 14th, came word of hope. An empty gasoline drum bearing a message from the missing men was found a mile north of Lac de Gras, some 75 miles southeast of Point Lake. The message, written by Coleman, stated that his aircraft carried enough gasoline for another hour's flight, and that he proposed to fly south for thirty-five minutes and then land. The searchers redoubled their efforts, but now the weatherman interfered. On the following day snow fell. All aircraft were grounded by high winds, and clouds made visibility poor.

However, the search was brought to a successful

conclusion on September the 16th, when pilots Matt Berry of Canadian Airways and Marlowe Kennedy of MacKenzie Air Service located the aircraft in Point Lake, after thirty days of one of the most intensive searches in the history of Canadian Aviation. Coleman and Fortey, if one considers what they had been through, were in surprisingly good physical condition; and they were moved by air to hospital in Edmonton on September the 17th.

Flt. Lt. Coleman's own story, as told at the time, will best fill in the details which are missing from the foregoing bald narrative.

"After two hours' flying I believed, since there had been a north wind at take-off, that I was south of my track. I therefore headed west in the hope of picking up Great Slave Lake. At the end of three hours I realized I was lost and landed in a lake to consider the situation.

"There we left some empty gasoline drums and a note, enclosed in a tobacco tin, stating the time, the date, and our intended course. It was decided to fly south for one half-hour and then pick out a

final stopping-place. Only an hour's fuel remained, and south course was decided upon in view of the possibility of running into timber. Shortly after taking off, we saw a lake to our west. Several small clumps of timber were observed, so I carried on in the hope that the timber would improve. Then, since the fuel supply was dwindling fast, I landed and beached the aircraft. We set up camp and we made ourselves as comfortable as possible. Fortunately there was sufficient timber nearby, and with the aid of two struts from the aircraft we made tent poles.

"The next day we opened the emergency rations and portioned them out so that they would last us for three weeks. The rations proved to be of excellent quality and, while scanty, held out according to plan. After that we subsisted on two ground squirrels which we managed to snare, and a few berries. Although all our attempts at fishing proved unsuccessful, we were actually without food for only one week. Our greatest fortune was in being near timber, so that it was possible to

keep fairly comfortable by means of a stove made from an empty gasoline drum.

"The chief factor that prevented our being found sooner was the continued bad weather. Only five of the entire thirty days were really suitable for effective search. The possibility of an early freeze-up was a discouraging aspect of our situation, but the whole-hearted work of the search parties fortunately made our fears groundless."

\* \* \*

The present instalment of "Northern Skytrails" concludes the chapter on the RCAF's work in the sub-arctic from 1927 to 1939. The next chapter (a very brief one) will summarize commercial aviation in the same region and up to the same date. This will in turn be followed by an account of certain RCAF operations in the arctic prior to the outbreak of World War II.

The aim of the writer, throughout this series of articles, has been to create a general conception of our Service's contribution to northern aviation



*Flt. Lt. Coleman, LAC Fortey, Matt Berry*



*Fairchild and Coleman's camp at Point Lake*

rather than to give a detailed history of it. No mention has been made of the many other men whose work was just as valuable as that of the men whose names have appeared in these pages. Names have, in fact, been used as little more than pegs on which to hang descriptions of typical operations. Until 1939, the broad pattern of

those operations remains approximately unchanged —with the exception of a few more or less dramatic episodes of which Group Captain Coleman's experience is, fortunately, a particular rather than a typical example.

*(To be continued)*



## A SHIRT TALE

THE TALE of a shirt, somehow, has become involved in the amazing mechanism of international air transport. It seems that a bachelor in Stockholm has discovered a novel solution to the local laundry problem. Accustomed to waiting three weeks to get his shirts back from the laundry, this imaginative chap has hit upon the solution. He air expresses his shirt via SAS (Scandinavian Airlines System) to New York. It gets there in one day, is laundered on the second day and is flown back to Stockholm on the third day. Time saving: 18 days!

*(Courtesy of "Canadian Aviation")*

# LET'S COUNT OUR BLESSINGS

by FLT. SGT. L. H. KELSEY

A MAN BOUGHT A HOUSE. Although at first every detail of the house had been to his family's liking, it wasn't long before the wife was wishing that certain components were larger, or smaller, or differently located. Repeated discussions eventually convinced them that the whole place was unsatisfactory, and they decided to sell out and either find or build their dream-place elsewhere. The husband placed the property in the hands of a real estate dealer, who assured him that a satisfactory deal would be arranged in a very short time.

The next morning the real estate dealer received a call from the husband instructing him to cancel the whole deal. Politely, but somewhat grimly, he requested an explanation of this sudden change of mind. "Well," came the reply, "my wife and I read the advertisement you put in last night's paper about our place here, and it made us realize that this is the very place we've always dreamed of having."

The lesson of the above parable is obvious: time and familiarity tend to blind us to the value of even our most prized possessions. None the less, it is a lesson that many of us only learn when it is too late to do anything about it. I am thinking now of several friends and acquaintances whom I have known in the Services . . .

Most airmen who apply for discharges are in a state of mind similar to that of the husband when he decided to sell his home. Having become "brassed off" by some minor unpleasantness, or by several minor unpleasantnesses, they have forgotten all the good points about Service life—fellowship, working conditions, long holidays, recreation, security, good pay—and the entire picture has taken on a sombre and hopeless aspect for them. The only solution seems to be discharge and a fresh start in the greener fields of civilian life. For men who find themselves (as who has not found himself at some time or other?) in this frame of mind, it might be an excellent idea to try the plan adopted by Dafoe's immortal hero, Robinson Crusoe.

When that unlucky mariner was cast up on an unknown desert island, his mental outlook was anything but carefree. During his first months there, the dismal prospect of living out his days without human companionship occasioned frequent thoughts of suicide. Then he began the compilation of a ledger. All the evils that had befallen him he listed on the debit side, and all his blessings on the credit. He found that each time he entered an evil, the ink was hardly dry before a blessing came to his mind and was entered on the credit. When he had completed his columns, he found to his amazement that the blessings far outnumbered the evils. The contentment this discovery afforded him enabled our friend to survive and even to enjoy his many years of exile.

I cannot help feeling that, in almost every case, an honest stock-taking will show the dissatisfied airman that the many advantages of Service life greatly outweigh those features of it that occasion our moans. Further, I would suggest to him that before he takes any steps he may later bitterly regret, he scrutinize carefully the "greener fields" which so entice him and that he make sure that the very "evils" he wishes to escape are not even more prevalent on the other side of the fence.

Constantly I hear from my civilian friends accounts of the injustice, the low pay, the stool-pigeons, the nepotism and the politics, which bedevil their daily lives. Some of these tales may be true, many of them probably result only from the narrator's state of mind. Be that as it may, it would seem that these moans of ours are not peculiar to the Service, and that neither do we suffer from the greater share of woes.

Therefore let us make whatever comparisons we can, with open minds and unemotional appraisal. If we take time off to count our blessings, I think we shall find that we already have the finest this troubled world of today can bestow.



# ROYAL CANADIAN AIR FORCE

# Association



## Western Welcome

ON JANUARY 26TH, Air Chief Marshal L. S. Breadner, C.B., D.S.C., Provisional President of the RCAF Association, left Ottawa on a tour of the Western Provinces to acquaint ex-RCAF personnel with the aims and objects of the Association, and to assist in the formation of local Wings of the Association in the centres visited. He was accompanied by Mr. R. S. McCartney, M.B.E. (Secretary of the Association), Flight Lieutenant L. A. Hall (of the Photographic Wing, Rockcliffe), and Flying Officer P. K. MacDonell and Corporal L. Carrière (of Air Force Headquarters).

The Air Chief Marshal addressed meetings at Winnipeg, Regina, Moose Jaw, Saskatoon, Edmonton, Calgary, Lethbridge, Vancouver, Victoria, and Courtenay. At each of these centres, Wings of the Association are now organized or in the process of formation.

Wherever he spoke, the idea of a national Air Force Association was enthusiastically received both by ex-Air Force personnel and by existing Air Force groups.

The Association is indebted to the RCAF, the RCN, and many organizations and individuals who helped in organizing the meetings in the West and in providing accommodation. In Winnipeg, Edmonton, and Calgary, the meetings were held at RCAF Stations. The Canadian Legion was most helpful and offered the facilities of its halls in Regina, Moose Jaw, Edmonton, Vancouver, and Lethbridge. In Vancouver, the Air Chief Marshal had the pleasure of addressing the Air Force Association, Branch 176 of the Canadian Legion, at the annual general meeting, where he was given a very cordial reception. This

live-wire organization, although formed only in January of 1945, has for some time owned its own premises in the Kitsilano district in Vancouver. In Saskatoon, the Navy came to our assistance and offered the facilities of H.M.C.S. Unicorn for our organization meeting. In Vancouver we were extended the facilities of the Seaman's Club, and the club rooms of the Navy Veterans Branch of the Legion were made available to us in Victoria.

The Army, Navy and Air Force Veterans, too, have extended their support to the formation of the Association. Mr. A. J. Wickens, Dominion President of ANAFV, informed the Air Chief Marshal on his visit to Moose Jaw that his organization had passed a resolution extending the facilities of all its premises to the RCAF Association, and our meeting in Lethbridge was held in the ANAFV Hall. We were indebted also to United Services Institute and Military Institute Messes, to the Lethbridge Flying Club, and to the many individuals who offered to help form Wings in the centres visited.

One of the serving members of the RCAF (Regular) who accompanied the Provisional President on his Western tour, Flight Lieutenant Hall, gave an address at many centres on last





*Left to right: LAC Patenaude, Mr. R. S. McCartney, F/O P. K. MacDonnell, F/L Thomas, F/L Greenway, Air Chief Marshal Breadner, F/L Hall, F/O Hlady, Cpl. Carrière, Sgt. Hannam.*

summer's record-breaking photographic survey conducted by the RCAF. The enthusiasm and attentiveness with which his talk was received was indicative of the interest of ex-Air Force personnel in the peacetime operations and developments of the RCAF, and it is hoped that many more such competent lecturers will visit Association Wings as a regular feature of Wing activities.

Flight Lieutenant Hall was ably assisted by Corporal L. Carrière, projectionist, who showed a film depicting the RCAF photographic operations. He also showed the picture "Wasp Wings" at all centres visited. This is a most interesting documentary film of RCAF fighter operations overseas, and it is hoped that it will be possible later to make it and other films like it available to the Wings of the Association upon request.

Flying Officer P. K. MacDonnell was of great assistance in answering many individual queries of ex-Air Force personnel on the subject of Records.

## Recent Organizational Progress

Our first contribution to "The Roundel" told of the Guelph Wings Club, the Air Force Club of Kirkland Lake, and the Sarnia Air Force Association having joined as Wings of the national Association, and that Wings had been organized in Regina, Moose Jaw, Saskatoon, and Granby. Up to the present date of writing (Feb. 22nd), we are pleased to report that the Sudbury and District Air Force Association have informed us of their unanimous vote to become a Wing of the Association, and the Women's Division Club of Halifax have applied for their Wing Certificate as No. 100 (Bluenose) Wing. In addition to the new formations at Winnipeg, Edmonton, Calgary, Lethbridge, Vancouver, Victoria and Courtenay, which were activated during the visit of the Provisional President, Wings are also in the process of organization at Timmins, Ontario, and in Quebec City.

Excellent response is now being received to the general membership invitations sent to ex-RCAF personnel through the courtesy of the Chief of the Air Staff and the facilities of RCAF Records. Hundreds of ex-Air Force personnel have this past week indicated their desire to assist in forming Wings in their communities, and undoubtedly by the time this issue of "The Roundel" is off the press, many more Air Force groups will have joined, and many more Wings will have been formed throughout the country.

### Future Developments

It is the Air Chief Marshal's hope that within the next few months he will be able to visit cities in Ontario, Quebec and the Maritimes. He cannot, however, personally visit every centre, and the formation of most Wings will be undertaken by Air Force veterans in the community, just as has been done recently by Flight Sergeant R. E. Meyer in Granby, Miss Ruth Vogler in Halifax, Mr. Ernie Cain in Timmins, Mr. Jean A. Gagné in Quebec City, and as was done earlier by the many other Air Force groups organized before the national Association was under way. Dominion Command H.Q. and Provincial representatives will offer every possible assistance and will supply a suggested procedure to be followed.

It is hoped that many more hundreds of ex-Air Force personnel will have the opportunity of meeting and hearing the Air Chief Marshal speak on the part the Association can play in the interest both of our country and of the Air Force veteran. We quote briefly from his address to the Winnipeg meeting on January 28th:

"In Canada we have never had a nation-wide organization of Air Force Veterans. The other Services are ahead of us in this respect, the Army in particular being well represented. They have Dominion Associations in very nearly every branch of their Service. We now have the opportunity to have a nation-wide Air Force Association that can speak for all bodies of ex-Air Force personnel, expressing the 'Air' view with full force. Our Wings can become worth-while and influential organizations in the community, planning and executing a sound community spirit, and

providing enjoyment and satisfaction to each member in working together to achieve our aims, and in a spirit of fellowship among both former and present members of the RCAF. The Association will be its strongest only if you and you and you and all ex-Air Force veterans actively participate. The strength of the Association in the community will depend upon the mettle of the personnel in the Wing, and the strength of the Association across Canada will be the sum of the calibre of its Wings. If we all get behind the Association with an objective attitude of, not only 'WHAT WILL I GET OUT OF IT', but also 'WHAT CAN I PUT INTO IT', we will all be proud of the result."



*The Rotochute. General Electric Co.'s supersonic parachute for lowering research instruments from rockets. It slows down to 27 m.p.h.*

# House-Hunt in **PRAGUE**

XXXXXXXXXXXXXXXXXXXX

by GROUP CAPTAIN R. A. CAMERON,  
Canadian Air Attaché, Prague

THIS TALE SHOULD CONFUSE YOU. If it doesn't, I have failed in my purpose. No one whose mind is not utterly confused can hope to understand the problem of house-hunting in Prague (or Praha). The experience I am about to describe occurred when my family and I had been living in a hotel for almost a year. Every word of it is true. The two other characters in it were a man who had recently been warned for posting to another embassy, and his wife.

Since the embassy to which he himself belonged was rapidly expanding, I was naturally suspicious. Why had he contacted me instead of passing on the accommodation to one of his own no less necessitous fellow-countrymen? However, I had reached the stage where I was ready to clutch at any straw at all; so I went to see him and, as soon as was decently possible, asked the sixty-four dollar question: why was the house being allowed to go outside the embassy's "family circle"?

Well, it seemed that there was a question of claiming three months' quartering allowance and one person would lose out if a deal were completed between two people from the same embassies . . . "and of course, if you take the house, I'd like to have the three months' rent in advance—in American dollars. I've ordered a new car in New York and I'm a bit short. It's so nice to have a car the moment you get off the boat, isn't it? Otherwise you spend all your leave travelling on trains and buses. Frightful!

"Furniture? Well, you can have mine for three months. I've got a lot I can sell you, too. That chesterfield set over in the corner there will have to go back to the Chinese Ambassador. We never use it, though, so you won't miss it. Funny design, isn't it? I don't know where he got it. All our Spanish furniture would remain too. We bought a lot when we were in Spain, you know. Lovely stuff it is, too. There are only a few pieces we'd take with us. The rest can all stay.

"Oh yes, we certainly do have a refrigerator. Two of them, as a matter of fact. One we'll be taking back to America, and the other I'd like to sell. I paid about \$150 for it to start with, but there were a few repairs to make. The whole thing came to \$400 before I was finished. I'd let you have it for \$200. All right, if you don't want it, I'll just take it with me. But the stove—I'd be very glad to get rid of that. Not that it isn't in first-class condition. It's simply that it cost me \$100 to have it installed and if you put one in you'd only have to pay again. The \$175, plus the three months' rent, will be the exact amount I need for the car in New York.



"You don't need to pay anything for the fancy matting on the second floor or the safe in the wall or the lighting fixtures in the bedrooms. The man I got the house from is still after the money for them, but I asked the Narodny Vibor and they said to let him take the things out—but to insist that he put everything back the way it was when he took the house. Of course he can't do that, so he just leaves the place alone. He may get difficult, though.

"Why, of course we can go look around.—Come on, dear.—Yes, there are plenty of carpets and they'll all stay. That's our favourite in there. Lovely, isn't it? I'd be afraid of leaving it with children in the family, but most of the rest would remain.—That confounded dog! Come off that rug this minute!—He's really a good dog, you know. Breaks the odd bit of furniture now and then, but he doesn't mean to. And this one here is a very expensive little prayer rug we picked up in Spain.—It is so a prayer rug, dear!—They get down on their knees like this and go forward like this. Its one of our favourites and I think we would have to take it with us.

"You do? We think it's lovely, too. We didn't know what to do for a buffet at first, but we saw that marvellous old carved door and we found a man to make it up for us. Yes, it comes from Spain. Most of our stuff does. But we'd leave everything. That's my mother. She does look natural doesn't she? The artist painted her in that chair right there. My, how she loved that chair! I guess we'll just have to take that chair with us. I'd be worried sick lest anything happen to it. But there's lots of furniture and you wouldn't miss it a bit. Besides the picture of my mother, there are only a few others that we'd pack right now.

"Let's go upstairs. Lovely view from the balcony, isn't it? You can live up here quite comfortably without ever going down. As a matter of fact we did—the three weeks before M... had the baby. I had to go to work, of course, but we ate all our meals up here and I never went down during the evening at all. By the way, that's the matting I was telling you the ex-landlord wants \$300 for, but he'll never get it. And there's the safe in the wall I mentioned. It

isn't worth \$40, do you think?—Of course I won't wake the baby, dear! You make twice as much noise as I do.

"The nurse lives here and the servants live on the next floor on that end. On this end there's one of the butlers who works in the castle for President Benes. I suppose he could live in the castle, but he likes the rooms he has here and I can't get him out. There's a law, you know. He offers me some money each month, but I don't take it, so he can't have any claim on me. He and the cook have a separate gas meter and they fix that up by themselves. The Domovnik? He lives downstairs with his wife. We used to employ them around the house at first but they were hopeless. Besides that, we found out that they were communists. Yes, I suppose one might say we had a few extra people in the house, but you just can't do a thing about it.

"If you want to, you can use the same contract that I was going to have with the V's. They couldn't take it at the last minute. There was a release clause should anything happen before the date of our move, and of course the bit about the packers. They'll be ready for packing about the third week in July and there's an item which requires you to give them full facilities to get things packed. I don't think that they'd bother you for more than a week, but time passes quickly—especially when you're moving."

Notwithstanding the foregoing diverting conversation, I was able to do a little mental calculation on the side. I came to the conclusion that the only practical proposition would be to take the house empty right from the start. Even though it wouldn't be clear of all the odds and sods living in one room or another in the upper and basement floors, removal of the furniture would save about 40-odd thousand other complications. Whether by that time I really expected anything like a reasonable answer to my suggestion, I don't know. Be that as it may, this was what I got:

"You'd rather take the place empty? My dear fellow, I couldn't possibly let you do that. I'd lose three months' rent on the furniture and then I wouldn't be able to pay for the car in New York!"

# AIR NAVIGATION

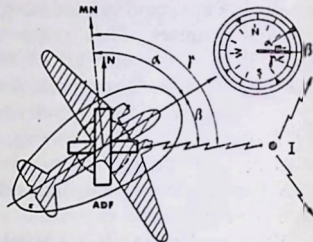
# Radio Aids

## PART 2

### DIRECTION FINDING (continued)

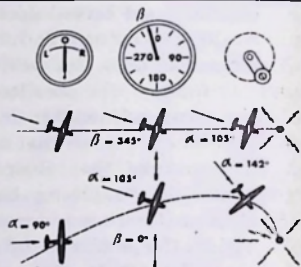
6 DIRECTION-FINDING BY RADIO COMPASS OR AUTOMATIC RADIO COMPASS (ADF)	RADIOGONIOMETRIE PAR RADIO-COMPAS OU RADIO-COMPAS AUTOMATIQUE (ADF)	RADIOGONIOMETRÍA POR RADIO COMPÁS O RADIO-COMPÁS AUTOMÁTICO (ADF)	EIGENPEILUNG MIT RADIOKOMPASS ODER AUTOMATISCHEM RADIOKOMPASS
LOOP CRANK (AND SCALE)	COMMANDE DU CADRE (DE L'ÉCHELLE)	MANDO POR MANIVELA DEL CUADRO	RAHMENKUREL (UND SKALA)
AUTOMATIC LOOP DRIVE	COMMANDE AUTOMATIQUE DU CADRE	MANDO AUTOMÁTICO DEL CUADRO	AUTOMATISCHER RAHMENANTRIEB
SINGLE (DUAL) LOOP ASSEMBLY	CADRE SIMPLE (DOUBLE)	CUADRO SIMPLE (DOBLE)	EINFACH- (DOPPEL-) RAHMENAGGREGAT
NON-DIRECTIONAL SENSE AERIAL	ANTENNE AUXILIAIRE DE SENSIBILISATION	ANTENA AUXILIAR DE SENSIBILIZACION	UNGERICHTETE HILFSANTENNE

The RADIO COMPASS provides an unidirectional bearing indication, whereby a sense aerial and a special receiver detect the direction of origin of the incoming wave, thus cancelling the 180-deg. ambiguity of the simple D/F loop system. The AUTOMATIC RADIO COMPASS has a powered rotating mechanism (in place of the simple loop crank) which automatically brings the loop to null position, irrespective of changes in aircraft heading. In models with dual loop assembly, an inner loop replaces the sense aerial; located perpendicular to the main loop, it gives maximum volume of reception when the latter gives minimum. The ADF Indicator has a fixed outer scale and a moveable inner scale, adjusted either manually or automatically to give the aircraft heading ( $\alpha$ ), thus directly indicating the angle ( $\gamma$ ) between the bearing line and the north.



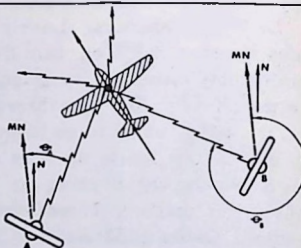
7 HOMING WITH D/F	HOMING PAR RADIOGONIOMETRIE	HOMING POR RADIOGONIOMETRÍA	ZIELFLUG MIT EIGENPEILGERÄT
LOOP IN HOMING POSITION	CADRE EN POSITION DE HOMING	CUADRO EN POSICIÓN DE HOMING	PEILRAHMEN IN ZIELFLUGLAGE
UNCORRECTED FOR DRIFT	SANS CORRECTION DE LA DÉRIVE	CON CORRECCIÓN DE LA DERIVA	OHNE WIND-BERICHTIGUNG
CORRECTED FOR DRIFT	AVEC CORRECTION DE LA DÉRIVE	SIN CORRECCIÓN DE LA DERIVA	MIT WIND-BERICHTIGUNG

When the D/F loop is set perpendicular to the aircraft's longitudinal axis and the aircraft is steered so that a null signal is always received, the aircraft is heading either to or from the station (QDM or QDR) along a track which is curved according to lateral-wind conditions. Off-course derivations are indicated as visual left-right signals and/or as aural A-N Morse signals, or else transformed into pulses which are fed direct to an automatic-pilot device. To compensate drift, the loop can be brought slightly out of null position by setting the null pointer to the downwind side of the aircraft's nose.



8 GROUND DIRECTION-FINDING	RADIOGONIOMÈTRES AU SOL	RADIOGONIÓMETROS EN TIERRA	EINFACHE FREMDPEILUNG
MAGNETIC (QDR) OR TRUE (QTE) BEARING	RELEVEMENT MAGNÉTIQUE (QDR) OU VRAI (QTE)	MARCACIÓN MAGNÉTICA (QDM) O VERDADERA (QTE)	MISSWEISENDER (QDR) ODER RECHTWEISENDER (QTE) PEILWINKEL
MAGNETIC (QDM) OR TRUE (QUJ) HOMING COURSE	CAP DE HOMING MAGNÉTIQUE (QDM) OU VRAI (QUJ)	RUMBO DE HOMING MAGNÉTICO (QDM) O VERDADERO (QUJ)	MISSWEISENDER (QDM) O D. RECHTWEISENDER (QUJ) ZIELKURS
DISTANCE FROM... (QGE)	DISTANCE A... (QGE)	DISTANCIA A... (QGE)	ENTFERNUNG VON... (QGE)
POSITION (QTF)	POSITION (QTF)	POSICIÓN (QTF)	STANDORT (QTF)

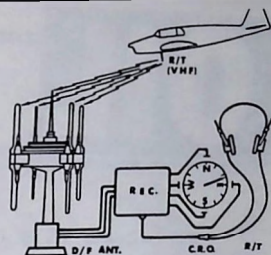
At the aircraft's request, ground D/F receivers (e.g. A and B) take bearings on the airborne transmitter (which has identified itself) by determining the angle between the bearing line and the magnetic (MN) or true (N) north, and radio these bearings back to the aircraft, thus enabling the fix to be plotted on board the aircraft. Alternatively, ground stations can plot the fix and radio it to the aircraft. International Q-codes is used in communications.



# The Roundel

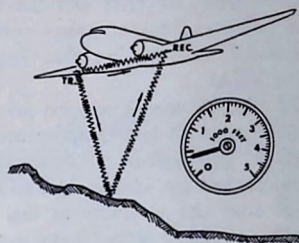
<b>9</b>	<b>GROUND VHF AUTOMATIC DIRECTION-FINDING</b>	<b>RADIOGONIOMÈTRES AU SOL AUTOMA- TIQUES VHF</b>	<b>RADIOGONIÓMETRO EN TIERRA AUTO- MÁTICO VHF</b>	<b>AUTOMATISCHE VHF SPRECHFUNK- FREMPFUNG</b>
	<b>CATHODE-RAY OSCILLOGRAPH (CRO)</b>	<b>OSCILLOSCOPE CATHO- DIQUE; TUBE A RAYONS CATHO- DIQUES</b>	<b>OSCILLOSCOPIO CATÓDICO; TUBO DE RAYOS CATÓDICOS</b>	<b>KATHODENSTRAHLEN- RÖHRE (BRAUN'SCHE RÖHRE)</b>
	<b>D/F ADCOCK AERIAL SYSTEM WITH (CENTRAL) SENSE AERIAL</b>	<b>ANTENNE ADCOCK DE RADIOGONIOMÈTRE AVEC ANTENNE (CENTRALE DE SEN- SIBILISATION)</b>	<b>ANTENA ADCOCK DE RADIOGONIÓMETRO CON ANTENA (CENTRAL) DE SENSIBILIZACIÓN</b>	<b>ADCOCK-PEILANTENNE MIT (MITTLERER) FÜHLANTENNE</b>

VHF voice transmissions from aircraft are received by aerodrome receivers equipped with fixed H-type Adcock aerial systems employing folded dipoles; direction of incoming waves is continuously indicated on the scope of a cathode-ray tube. In this way QDM and QDR bearings can be read off from the control tower without delay at the same time as the voice communications are maintained. Range up to 100 miles.

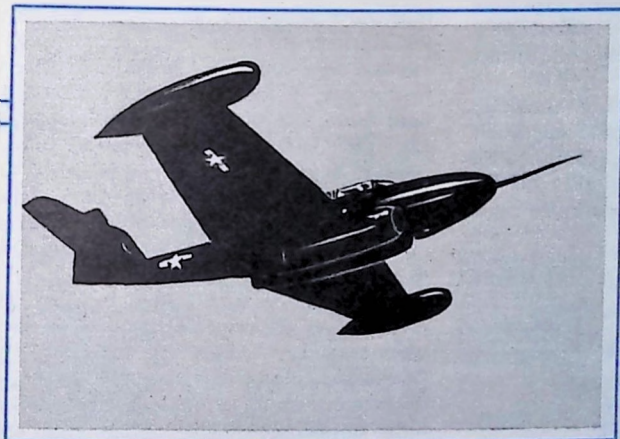


<b>10</b>	<b>ALTITUDE DETERMINATION BY UHF RADIO ALTIMETER</b>	<b>RADIO-ALTIMÈTRES UHF</b>	<b>RADIO ALTIMETRO UHF</b>	<b>HÖHENBESTIMMUNG DURCH UHF RADIOHÖHENMESSER</b>
	<b>TERRAIN CLEARANCE</b>	<b>HAUTEUR AU-DESSUS DU SOL</b>	<b>ALTURA SOBRE EL SUELO</b>	<b>HÖHE ÜBER GRUND</b>
	<b>INTERFERENCE MEASUR- ING DEVICE</b>	<b>FREQUÈNCIÈMÈTRE DIF- FÉRENTIEL (INTERFÈRO- MÈTRE)</b>	<b>FRECUENCIA METRO DIFERENCIAL (INTER- FERÓMETRO)</b>	<b>FREQUENZUNTERSCHIED- MESSGERÄT</b>
	<b>TRANSMITTED WAVE</b>	<b>ONDE INCIDENTE</b>	<b>ONDA INCIDENTE</b>	<b>ABGEGANGENE WELLE</b>
	<b>REFLECTED WAVE</b>	<b>ONDE RÉFLÉCHIE</b>	<b>ONDA REFLEJADA</b>	<b>RÜCKKEHRENDE WELLE</b>

For continuous determination of altitude above ground (terrain clearance), frequency-modulated continuous UHF waves are radiated from one of the aircraft's dipole aeriels (whereby their frequency is varied linearly between a maximum and a minimum), reflected from the ground and received by the second dipole aerial. The difference in frequency between the transmitted and reflected waves, which is proportional to the terrain clearance, is measured by an interference measuring device and indicated in feet on the radio altimeter scale.



★ ★ ★ ★



Northrop XF-89

(Courtesy of "Inter-Services Aircraft Recognition Journal")

# OIL

# DILUTION



by FLT. LT. W. H. QUINN

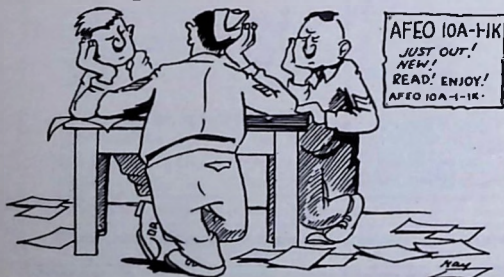


THE PURPOSE OF THIS ARTICLE is to familiarize both pilots and maintenance personnel with the reasons for the operation of oil dilution as practised in the RCAF.

Oil dilution was developed primarily to permit reliable starts at low temperatures with the least possible application of external heat. This is accomplished by adding fuel to a portion of the oil so that the viscosity at low temperatures is near the viscosity of the oil at normal temperatures. In practice, most of this dilution is evaporated out of the oil by the engine heat within 30-40 minutes after starting the engine.

In addition to making cold starts at low temperatures a practical operation, oil dilution, when used properly and regularly, tends to prevent and remove accumulations of carbon and sludge from the engine so that less engine wear takes place. This in turn results in more reliable performance and increased engine life.

The above advantages, however, can be nullified by improper procedures and irregular operation. The authorized procedure is detailed in AFEO 10A-1-1K (M2/19/12/4th Issue) and this instruction should be carefully studied by all pilots and aero-engine mechanics.



It is essential that oil dilution be carried out when the oil temperature is at or only slightly below 40°C., if the operation is to be successful. At temperatures much lower than this the fuel will not mix thoroughly with the oil. The failure to mix will result in either a hard start because of sluggish oil, or in damage to the engine because of insufficient lubrication. At temperatures higher than that recommended, difficulty will be experienced in maintaining permissible minimum oil pressures throughout the complete oil dilution operation. In this case it will be necessary to shut down the engine and allow it to cool off before completing the operation.

It is also essential that the proper percentages of dilution be maintained in accordance with the current weather conditions. These percentages are controlled by the length of time the fuel-to-oil inlet valve is opened; and again, these times are laid down in AFEO's. When in doubt as to the dilution time required, check with the CTO for instructions. If too little dilution is carried out, a hard start will result with possible damage to the engine because of oil starvation. If too much dilution is carried out, loss of oil may be experienced (on some engines) by foaming from the engine breathers, and low oil pressures will be registered—with a further possibility of damage to the engine.

Under-dilution is indicated by fluctuating oil pressure, an oil pressure drop when throttle is opened, and/or excessively high oil pressures. Corrective action consists usually of operating the dilution system for a further period after starting until satisfactory engine operation is achieved. This action is not approved for all types of engines, however, and specific cases should be referred to the CTO.

Over-dilution is indicated by low oil pressures and possibly a discharge of oil foam from the engine breathers. Corrective action consists of reducing power and RPM immediately. If oil pressure is below the minimum permissible, the engine must be shut down and allowed to cool off before re-starting. If the period of dilution was normal, then consideration should be given to reducing it to a figure just sufficient to satisfy cold starting requirements.

Oil dilution should be carried out regularly during both winter and summer operations. The need for dilution during cold weather can easily be appreciated, but the reasons for oil dilution during the warm weather months are less obvious. They are as follows. Accumulations of carbon and sludge tend to build up in various internal parts of all operating aero-engines. Diluted oil acts as a cleanser and tends to loosen these accumulations and carry them through the lubricating system where they can be removed by the filters. Regular oil dilution therefore maintains the engine in a clean condition.



There is, however, a danger in using oil dilution when engines have been operated for some time without it. The danger lies in the fact that, in this case, the first few dilutions wash accumulated sludge and carbon particles off the internal parts of the engine, depositing them in the oil where they may cause full or partial blocking of oil screens, filters, and oil lines. To prevent engine damage or failure from this cause it is essential that, in all cases where the past operation of oil dilution on any engine is doubtful or has been very irregular, oil screens and filters be inspected and cleaned after each flight. This procedure should be contained until such time as no further deposits are found and it is considered safe to leave the inspection of these screens and filters until the next regular inspection.

In conclusion, it should be pointed out that oil dilution, when properly used, benefits both the operation and the maintenance of any engine. Used improperly and irregularly, on the other hand, it may be a source of considerable danger.



# What

## DO YOU KNOW ABOUT

# ROCKETS ?

by FLIGHT LIEUTENANT P. J. EVANS

(Reprinted by courtesy of "Air Clues")

Until a short while ago our answer, too, would have been: "very little." For that was before we had met Mr. A.V. Cleaver who, as Special Projects Engineer with the De Havilland Engine Company and Chairman of the British Inter-planetary Society, *does* know a great deal about rockets. It was a lecture which he gave recently to the staff of the Empire Air Navigation School that prompted this article from a member of the E.A.N.S. Editorial Section. Mostly, the views expressed are those of Mr. Cleaver.

ALL FLUID PROPULSION systems work on the same basic principle: their thrust is developed from the reaction produced by a mass of gas thrown backwards at high speed. Thus, in the case of the airscrew, the mass of gas is atmospheric air which has been accelerated through the disc of the airscrew. In the jet engine the principle is similar, the only difference being that the air, while being accelerated, passes through a combustion cycle. Nor does the rocket motor provide an exception, for it, likewise, develops its thrust by throwing a mass of gas backwards. Whereas both the airscrew and the jet engine depend on air to provide the oxygen necessary to support the combustion of their fuel, the rocket carries along its own oxygen source (or oxidizer) and is therefore independent of the external atmosphere. This oxidizer can be pure oxygen or any other oxygen-rich chemical, such as hydrogen peroxide or nitric acid; and in those rockets using solid fuel, the fuel and oxidizer are usually combined in one chemical compound or mixture.

### The rocket motor

Current interest centres mainly on the liquid bi-propellant rocket—so called because the fuel and oxidizer are carried separately (Fig. 1). The

fuel in this case may be alcohol, petrol, paraffin, or any other hydrocarbon, or hydrogen, and there is a wide choice of oxidizer fluids available also. The propellants are fed, either by gas pressure or mechanical pumps, into a combustion chamber where they are burnt at a fairly high constant pressure; 300 lbs. to the square inch being a typical value. Because the fuel consequently burns in a very oxygen-rich atmosphere, temperatures are extremely high, usually over 2,000° (C.). This factor introduces severe problems of cooling, and normally these are solved by circulating one of the propellants around the combustion chamber in a coolant jacket. Then, the hot gases are expanded through a propulsive nozzle of the convergent-divergent form necessary to produce a supersonic exhaust velocity of about 7,000 feet per second. Thrust is generated purely by reaction; there is no question of the jet needing to push against the external air. In fact, the external air is in some ways a nuisance because it exerts a retarding back pressure on the exhaust: as a result, the thrust of the rocket motor actually rises slightly as altitude is increased. In this, it differs from the turbo-jet engine whose thrust falls off rapidly with height.

Other outstanding features of the rocket motor

are the relatively small mass and extremely high velocity of its propulsive jet, which make it inefficient at low flight speeds; its very high consumption of propellants arising from the fact that the oxidizer, together with the fuel, has to be carried inside the rocket; and its simple and light engine which can handle very large quantities of energy in a most restricted space, thereby producing, in proportion to its installed weight or frontal area, enormous thrust outputs.

## Two German developments

During the recent war, work on rockets by the British was confined almost entirely to small solid propellant weapons. This tended, too, to be as true of the Americans who, while they nevertheless did much more work on liquid propellant types, never approached the scale of effort achieved in this sphere by the Germans. A great advantage which the liquid propellant type of rocket has over its solid propellant counterpart is that it makes possible the control and varying of the output of the motor, stopping and starting it on a throttle, as with a more orthodox engine. Also, there are far more powerful propellants available in a liquid state.

One German example of the liquid propellant rocket was the Me. 163, a little tailless interceptor which could climb to 40,000 feet in three minutes and do over 550 m.p.h. It was wholly rocket-

powered, its motor giving nearly 4,000 lb. thrust and burning an alcohol fuel base in hydrogen peroxide.

Another German model, the V2 projectile, weighed 12½ tons at take-off and its motor, weighing about a ton, developed 60,000 lb. thrust. The V2 burnt over 8 tons of alcohol and oxygen in about 60 seconds, during which time it ascended some 20 miles and attained nearly 3,500 m.p.h. At the instant when all the fuel had been consumed, the thrust horsepower being developed was over 600,000—a larger output than that from a large-sized power station. After burning all its fuel the missile coasted up to an altitude of 60 miles and achieved a total horizontal range of about 200 miles. Since the war, the Americans have sent the V2 to heights in excess of 100 miles in vertical shots.

## Application to aircraft

Now that the rocket has been brought to a high level of development, many striking applications should be possible in the future, quite a few of which will concern aircraft. The use of rockets for assisted take-offs is an obvious one, and is likely to grow in importance as aircraft become bigger and payloads heavier. In this connection the rocket works at low efficiency, but it is an incredibly light and compact source of power for short periods. Again, rocket motors would immeasurably improve the climbing abilities of jet fighters. Here, the vitally important characteristic of the rocket motor is its ability to maintain, and even to increase, its thrust output with altitude. Even at sea level a rocket motor will give about five times the thrust output of a turbo-jet; at 35,000 feet, about twelve times the thrust. Such a staggering performance compensates to a large extent for the high fuel consumption of the rocket and reveals it as the ideal power plant for short duration work.

## Increasing the range by "steps"

Guided missiles, both for offensive and defensive purposes, will obviously assume increasing importance in warfare. Range can be increased by the use of the step principle (Fig. 2) in which the rocket consists of a series of steps, or stages,

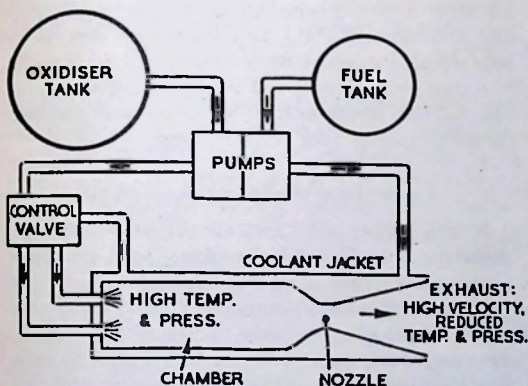


Fig. 1. Schematic diagram of liquid bi-propellant rocket motor.

each of which drops off in turn as the propellants are exhausted, leaving the step above to commence firing and continue the acceleration. In this way, the dead weight of structure and tankage which has to be lifted at any given instant is kept to a minimum. Probably the final step will be provided with wings to enable the range to be prolonged in a supersonic glide after falling back into the atmosphere. The German A.9/A.10 two-step project, intended to have transatlantic range, was designed on these lines. However, overcoming of the aerodynamic heating effects when such a projectile falls back into the atmosphere, and development of the necessary guiding equipment, will present severe problems. Which means that press-button warfare is undoubtedly

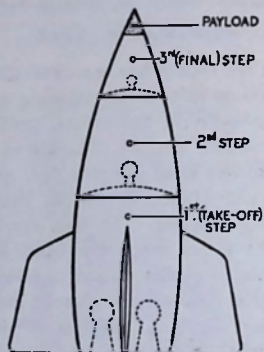


Fig. 2. "Three-step" rocket.

further off than is frequently suggested, though that is not to say that it will not arrive in due course. In the meantime, to obtain cosmic ray and other scientific data, developments in this field will have to be closely allied to those in the field of high altitude research.

### Interplanetary flight

The most fascinating possibility which the rocket opens up is that of interplanetary flight, although there are people, even today, who question the advisability or desirability of attempting such a venture. Reliable opinion places

50 years as the time which may elapse before the first interplanetary flight is made; but, as with most things, the actual period will be dependent mainly on the amount of effort and money which anyone is prepared to expend on exploration.

In any event, as with all technical development, progress will probably evolve gradually. First, all the rocket applications discussed here will be developed to successively more advanced conditions: the high altitude research rockets already mentioned, for example, will probably reach even greater heights and eventually carry pilots and observers.

### Orbital rockets

Establishment of orbital rockets or "space stations" circling the Earth as artificial satellites is likely to be the next step. At any given radius from the Earth there is a critical velocity which, if possessed by any body in that position, will prevent it from falling back to the Earth, the centrifugal force acting on such a body balancing the gravitational attraction. Thus, if a rocket climbed to the orbit concerned, and accelerated to the necessary velocity, it would continue to coast along the orbital path without further use of power, since there would be no forces (such as air resistance) tending to bring it down.

Such orbital rockets would have obvious uses in themselves. Their military value, and their use as scientific observatories to obtain atmospherical and astronomical data, are apparent; they could be used also as short wave radio relay stations: a few thus employed would ensure complete coverage to the Earth's surface, using wavelengths normally giving only optical range.

### Escape from the Earth's atmosphere

If still higher velocities can be obtained than those required for orbital rockets, then complete escape from the Earth's atmosphere will be possible. "Escape velocity" is the critical value which would allow a body to "race," as it were, the decreasing gravitational attraction of the Earth, which falls off in accordance with an inverse square law, depending on the distance of

the body from the Earth. A body possessing this initial velocity could continue to travel away from the Earth, its velocity always decreasing but reaching zero only at infinity, so that in practice it would never fall back. Although in theory a body can make any interplanetary journey at any speed (even at a steady 30 m.p.h. all the way), in practice the only technique offering anything like economy is acceleration to "escape velocity" as quickly as possible.

### What is to be the source of the energy?

The energy required to attain such a tremendous speed (nearly 7 miles per second, or 25,000 m.p.h.) is immense; so immense, in fact, that something

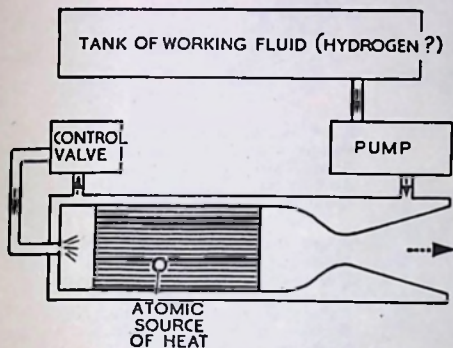
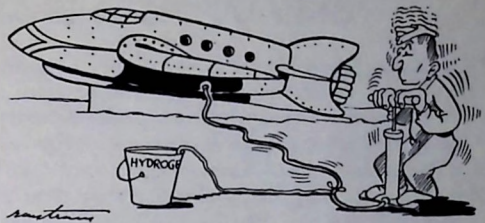


Fig. 3. Schematic diagram of possible atomic rocket.

more powerful than ordinary chemical fuels will obviously be required to impart that energy to any payload larger than that corresponding to a small load of instruments. For sizable "spaceships" carrying human crews and sufficient propellants for manoeuvring in space, landing, and returning to Earth, it seems that we shall need to discover how to apply nuclear energy to rocket propulsion. This might conceivably be done by applying an atomic energy source or pile to heat up a great mass of some secondary working fluid (such as hydrogen), which would be pumped into the chamber and then expanded through the pro-



pulsive nozzle in the usual way (Fig. 3). Hydrogen, because of its low molecular weight, would be particularly advantageous for this purpose.

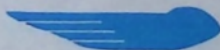
### Planet excursions

The first spaceship will probably circle the moon in an orbit without landing, on a sort of reconnaissance or survey mission. Subsequent ones will probably land there and return to Earth, while later still, trips might well be undertaken to other planets. Manoeuvres in space will be conducted with the aid of small directional jets pointing in the desired direction, and landings, by descending tail-first and using the main jets for braking purposes. Contrary to popular opinion the danger from meteorites is statistically negligible.

### More problems

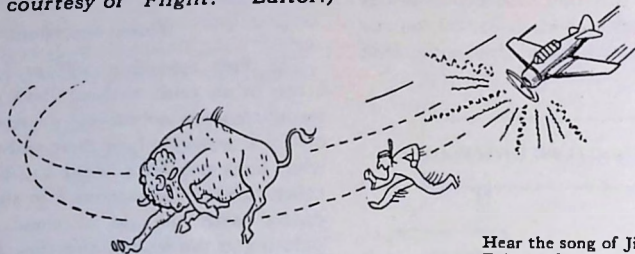
Many other difficulties, all of the utmost severity, will have to be overcome. Interplanetary flight introduces the problem of cabin pressurization in its most extreme form; navigational methods, radar aids, and computers, of the most advanced type, would be required also. Moreover, the effects, both physiological and psychological, of the weightlessness which the crew would feel, once the motors had ceased their thrust, are matters which merit detailed study.

Yet all these problems are subordinate to the main one of propulsion. If that can be solved, then given reasonable time, and with the advent of atomic energy, solutions to all the others can be found.



# "GIVE 'UM BIRD LOW-FLYING FELLOW!"

(The following verses appeared not long ago in "Flight," accompanied by this footnote: "Service pilots who were instructed or were trained in the Canadian Prairie Provinces, may remember this clever and humorous parody which appeared in 'Mentioned in Dispatches.' It was part of a subtle campaign instigated by RCAF Headquarters to combat low-flying accidents. It is again commended to all pilots who may now be considering their New Year's Resolutions." The lines were written nearly six years ago, under the inspiration of two or three beers, in the "Snake Pit." The "Snake Pit," which was located in the basement of a small Ottawa hotel, was for a long time operated by its genial and Air Force-minded landlord as a sort of unofficial AFHQ Mess. Some hundreds of "The Roundel's" readers will probably remember it with no less affection than does the beery bard himself. The illustrations are reproduced by courtesy of "Flight."—Editor.)



Hear the song of Jiving Chicken,  
Fairest of the Noknee maidens,  
Jiving Chicken, Honkitonka,  
And her lover, Flying Moosemeat,  
Dauntless paleface aviator.



Fleeter than the amorous grizzly  
In the rugged month of mating,  
Fleeter still was Flying Moosemeat,  
Swooping low above the prairie,  
Rolling low above the prairie,  
Shooting up the shabby bison  
In his yellow bird of iron!



Often in the summer mornings  
Came he roaring thro' the sunlight,  
Shook the teeth of old Nokomis  
Forth upon her buttered waffle,  
Ruined Sitting Bull's digestion,  
Set him belching in his porridge,  
Earned the hate of all the mothers  
Of incontinent papooses . . .



Flying Moosemeat, Flying Moosemeat,  
Rolling in the Grey Hereafter,  
Looping in the Land of Shadows,  
Bunting in Eternal Twilight—  
Nevermore shall Jiving Chicken  
Softly murmur "Jeepers Creepers!"  
Gazing upwards at your coming,  
Pausing with suspended needle  
As she sews the scalps together.

Old the story, old the story . . .

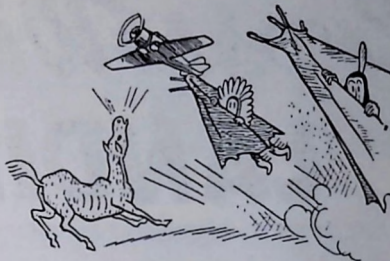
# The Roundel

Crouched within his secret wigwam,  
Stooped above his strange utensils,  
Grunting Gopher, gently grunting,  
Muttering spells and incantations,  
Labour'd at a task unlawful,  
Brew'd the draught called Hoochikoochi,  
Hoochikoochi, Fiery Water,  
Downfall of the Noknee Maidens.

Like a hawk came Flying Moosemeat,  
Full of humour, full of folly,  
Swooped upon the secret wigwam—  
But the west wind Mudjkeewis,  
Laughed and touched the flashing wing-tip.  
Touched it with his gusty fingers . . .

Ere the heart of Jiving Chicken  
Missed two beats within her bosom,  
There upon the silent prairie  
Crumpled lay the bird of iron.  
Grunting Gopher, no more grunting,  
Lay beside it, freed from labour,  
Round his legs the secret wigwam—

While the head of Flying Moosemeat  
Gently rolled across the prairie,  
Trundled gently o'er the prairie,  
Slowly trundled to a standstill  
At the feet of Honkitonka,  
Honkitonka, Jiving Chicken.



Nevermore shall old Nokomis  
Drop her dentures in the cowder.  
Nevermore shall Howling Cactus,  
Howling Cactus, cunning barber,  
Scalp his customers in error,  
Terrified by Flying Moosemeat.  
Nevermore within his wigwam  
Shall the furtive Grunting Gopher  
Leg the moccasin unlawful . . .  
Nevermore shall Honkitonka  
Plait the love-knot in her hair.

But each night she runs in circles,  
Honkitonka, Jiving Chicken,  
With her arms outstretched beside her,  
Giving forth a horrid buzzing,  
Diving with her ghostly lover,  
Zooming with him thro' the heavens  
Of the mentally unsettled . . .  
And the words of old Nokomis  
As she smokes her evening pipeful  
In the quiet hush of twilight  
Fitley end this Song of Sorrow . . .

"Maidens red or white or yellow—  
Give 'um bird low-flying fellow!"



# Cross-Wind LANDING GEAR



by RONALD A. KEITH,  
Editor, "Canadian Aviation"

*(Reprinted by courtesy of the author)*

TAKING OFF and landing with castering undercarriage is a novel experience, introducing, as it does, a new dimension in the ground handling of aircraft. The aircraft we flew was a GA-2 Goodyear Duck which had been assigned to the Canadian company as a demonstrator and was based at Malton airport.

The writer approached the cross-wind assignment prepared for a considerable mental adjustment. After years of aiming the aircraft in the required direction, it would require, we felt, considerable re-education to get used to the idea of "drifting" on the runway.

On the contrary, our experience was that there was a new feeling of release in being able to disregard that remnant of drift before touching down. One gained the impression that the ground loop bogey had been slain.

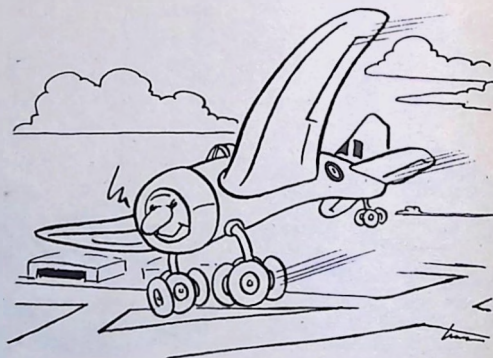
As many readers will recall, perfection of a device to enable safe and simple out-of-wind landings has been the goal of considerable effort, particularly since the war. The CAA in the U. S. has taken a particular interest in the project, having in mind the enormous sums of money involved in construction of multiple-direction runways.

Development has proceeded with pronounced success. Following the initial CAA engineering Approved Type Certificate, variations and im-

provements were introduced. The original device was designed to operate within the hub of a 6.00 x 6 wheel, a popular size for light planes. It allows the wheel to caster 25 deg. to either side of centre.

The CAA then turned its attention to heavier aircraft. Goodyear was given a contract to install the mechanism in the hub of a 17.00 x 16 wheel for a Douglas CC-3. This was equally successful and was demonstrated in Canada last spring.

Meantime, the cross-wind gear had been CAA-approved and adopted as optional equipment for Cessna, Stinson, and Piper light planes. Test installations also have been made successfully on a two-control tricycle Aeronca Chum, the Beech Bonanza and, of course, the GA-2 Duck. (Castering for the Bonanza and the DC-3 is 15 deg. on either side of the centre line).



Since its first tests slightly more than a year ago, some refinements have been made on the light plane swivelling wheels to improve ground handling and taxiing characteristics. A notch was cut in the centre of the cam surface into which the cam followers on the axle would fall when the wheels were centred. This means that in low winds there are the same taxiing characteristics as a conventional aircraft. It also meant that the aircraft could be manoeuvred at close quarters without the danger of the wheels casting at the crucial moment.

(A special pin lock to serve the same purpose was included in the DC-3 installation. In this case the pin is put in place by a mechanic.)



Taxiing with the casting wheels would take considerable familiarization, particularly in strong winds and restricted areas. Turning cross-wind, for example, there is a logical tendency for the nose to swing while the aircraft continues in the original direction. A touch of brake is sufficient to correct this, however.



*A Goodyear Duck sidling along the runway.*

On the take-off, the nose is simply headed into wind, by use of rudder, sufficiently to counteract drift. After getting accustomed to crabbing along the runway, the pilot discovers there is actually a considerable advantage in this position as it gives unrestricted visibility in the direction of take-off.

Similarly, with the landing it is only a matter of doing the same type of crabbed approach one would use for a conventional cross-wind landing, except that in this case the crabbed position is held right onto the runway.

As the aircraft sidles along at high speed it is hard to realize at first that you really are on the ground. But you soon begin to appreciate that something new and very significant has been added to the science of aviation.



*Bratukhin Helicopter*

*(Courtesy of "Inter-Services Aircraft Recognition Journal")*

# RCAF STATION



# Camp Borden

by WING COMMANDER E. C. LUKE, O.B.E.

IF YOU HAVE EVER SERVED at Camp Borden, I am sure you will understand what I'm trying to say. I cannot go back to that old sand farm, even for a few hours, without a nostalgic feeling of welcome that is as real and pleasant as a bright hearth fire. It can hardly be coincidence that so many others have at different times expressed to me the same thought.

What is it about this Camp Borden, anyway?

A few weeks ago I visited it on duty, and having some time to spare after work was done, I decided to take a walk along the hangar line. It was a beautiful mild day for January, more like March or April, and the snow had gone in some places. The weather suited my mood. It was one of those anomalous days that occasionally occur in defiance of the Borden winter and almost persuade us that Spring is about to arrive long before its time.

I had strolled only a short way when I discovered the very spot where, quite a few summers ago, I sat in the shade of the open hangar door and tried to learn the Sequence of Flying Instruction. That quiet corner hadn't changed much, really. Maybe those were even the same old grass roots I had parked on as a very young and equally naive Pilot Officer, full of the adventure and fascination of flight.

Nothing had been changed so very much. I took a long look around. There was the water tower in the distance, sharply silhouetted against some loose white clouds. Closer at hand, I saw the same old sprawling collection of miscellaneous buildings, and the groves of small pine trees that go on living so cheerfully but never seem to get any bigger. Over the sand dunes to the West there

was the line of low hills under the setting sun that will rim the Borden horizon to the end of time. Even the old hangars, their original nakedness covered with new protection, and with technical training under fluorescent lights going on within, had preserved their unmistakable line and contour.

Farther on I met an officer who seemed to be slightly startled or maybe dismayed at seeing a strange Winco wandering aimlessly about. He asked "Can I help you, Sir?" "No thank you," I answered. "Just a former Borden resident, taking a look around." At that he grinned and said "I was an AC2 here in 1929. Nice station to come back to, isn't it?" You see what I mean. He feels it too!

We have many stations now, some more pretentious and more modern, others more handsome, and certainly more efficient in so far as their layout is concerned. But they are *not* Camp



Borden. Maybe it's the soft swish of the wind through the little pine trees, or the colour of the birches and the sandy soil, or just the smell of the place. I don't know. But one thing I am certain of, beyond all imagination: the spirit of a host of gallant airmen of two world wars still lives and breathes in Camp Borden. For me it holds the very heart and soul of our Air Force, and I know that to thousands of our personnel, past and present, it will always be the Mother station of the RCAF and their true Service home.

# LETTERS to the EDITOR

*The letters on this page express only the opinions of their writers. They in no way reflect the official views of the RCAF.*

## ICONOCLAST

Sir: Your February issue, which portrayed the new working-dress for all ranks, has led to considerable discussion re such controversial matters as uniforms, rank insignia, and the like. It might therefore be appropriate to air some personal opinions about the similar problem of present rank nomenclature in the RCAF.

The ranks were undoubtedly first intended to be descriptive. Since the beginning of the last war, however, the flight has generally been led by a Squadron Leader, a squadron by a Wing Commander, and a group by an officer of Air rank. Furthermore, as a form of greeting or address, our rank titles are awkward and are seldom used. This is particularly true when one is ignorant of an individual's name. I shudder to think of addressing junior or superior officers with, "Hello, Squadron Leader," "How are things going, Pilot Officer?", or "Good-morning, Air Vice Marshal."

Despite a recent war and a growing Service, the public is still vague about Air Force ranks. In addition, foreign military personnel are only confused by our unconventional system. Americans, to whom a group and a wing are formations which are the reverse of our own, are at a loss in valuating equivalent ranks.

In these days of increasing international military collaboration, such points might possibly be worth considering.

F/O M. A. East

## FLYING WITH A COLD

Sir: While reading an article recently on the physiological aspects of flying, I was reminded of an unpleasant experience I had last summer while taking the jet conversion course. Never again will I ignore what the MO's say on the subject of flying with a head cold. Possibly a brief account of the experience referred to may be of interest to pilots who, like my former self, think that the doctors sometimes exaggerate. . . .

I had taken off and climbed to 25,000 ft. After nineteen minutes, my exercise completed, I started a let-down at 500 ft. per minute and 220 M.P.H. indicated. When I got to 15,000 ft., my right nostril became clogged on account of the slight cold from which I was suffering. I removed my oxygen mask and blew my nose. Immediately, the pressure seemed to build up in my sinuses and tears streamed from my eyes. The pain was the most excruciating I have ever experienced. I held altitude until the pain lessened, and then let down another thousand feet. When the extreme pain hit me and again my eyes streamed. However, by letting down in these easy stages, I eventually reached the ground in one piece—as luck would have it, with no worse after-effects than a splitting headache and bloodshot eyes which lasted the rest of the day.

Nonetheless, as I have often reflected since, had the fuel situation necessitated a quick descent to the airport (as in a jet might well have been the case), I have no doubt that I would at least have ruptured an eardrum—and quite probably even lost my life, as the pain might well have occasioned a crash.

F/O L. E. Evans

## A WORD FROM 420 (AUX). SQN.

Sir: Possibly some of your readers (particularly in other Auxiliary Squadrons) may be interested in the following brief account of what is going on in London, Ont.

Since the beginning of the year, the RCAF Station at London has been alive with activity reminiscent of war years. No. 420 City of London (Auxiliary) Squadron and the University of Western Ontario Air Training Flight have commenced full-scale recruiting. Wing Commander A. D. Haylett, A.F.C., who operated his own flying service in Western Ontario before the war, has been appointed CO of the Squadron and is rapidly whipping it into shape. With the establishment of officers almost filled, emphasis is being placed on obtaining experienced NCO'S and airmen.

Squadron Leader Murray L. Barr, who is Associate Professor of Anatomy at the University of Western Ontario and a former Medical Officer, has been appointed officer commanding the University Air Training Flight. This unit has already attained its initial year strength of forty and is one of the first in the Dominion to begin lectures. The trainees, who hold the rank of Flight Cadet, receive fifteen lectures the first year and fifty during the second and third years. Training is being conducted by Flt. Lt. S. C. Tugwell, A.F.C., of Kingston, who is Resident Staff Officer.

The City of London Squadron expects to commence ground training on Thursday evenings within a few weeks, as soon as sufficient recruits have been sworn in. An electronics course, employing modern radio and radar equipment, will be one of the first to be initiated. Every effort will be made to get ground sections functioning smoothly before the advent of air instruction.

Squadron Leader J. P. Coyne, D.F.C., Officer Commanding 9420 Unit, the permanent force section of the Squadron, is a Westerner from The Pas, Manitoba. He can't quite get used to Southern Ontario winters. He still speaks nostalgically of the pleasant climate of Churchill, his former Command.

No. 420 Squadron perpetuates the history of the Snowy Owls, the Lancaster squadron of the same number which was adopted by the City of London during the war. The glass-encased owl, squadron mascot throughout the European campaign, stares out balefully across the officers' mess after two flights across the Atlantic and a period of obscurity during the post-war shuffle. The Snowy Owl was chosen by the Squadron because it is a bird of prey found nowhere in the world except the Canadian northland.

W. E. Corfield,  
Public Relations Officer,  
No. 420 City of London Squadron



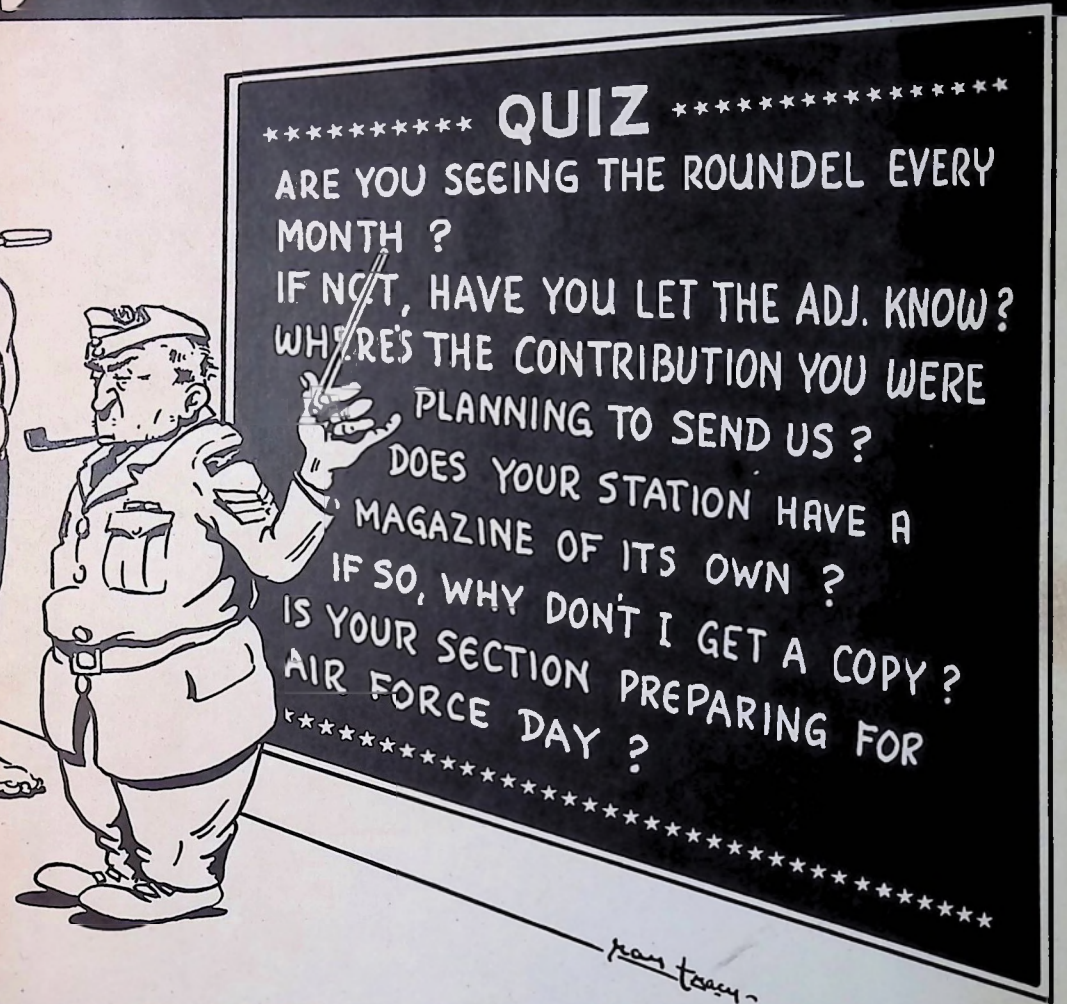
# Shatterproof's QUIZ

for all **TYPES.**



Answers to "What's the Score?"

- |       |       |       |       |
|-------|-------|-------|-------|
| 1: C  | 2: B  | 3: A  | 4: D  |
| 5: B  | 6: A  | 7: C  | 8: C  |
| 9: A  | 10: C | 11: D | 12: A |
| 13: B | 14: A | 15: D | 16: D |
| 17: D | 18: C | 19: D | 20: D |



\*\*\*\*\* QUIZ \*\*\*\*\*

ARE YOU SEEING THE ROUNDEL EVERY MONTH ?

IF NOT, HAVE YOU LET THE ADJ. KNOW ?

WHERE'S THE CONTRIBUTION YOU WERE PLANNING TO SEND US ?

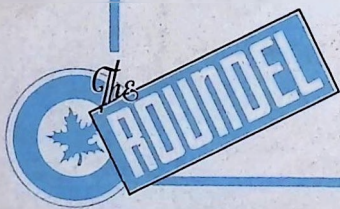
DOES YOUR STATION HAVE A MAGAZINE OF ITS OWN ?

IF SO, WHY DON'T I GET A COPY ?

IS YOUR SECTION PREPARING FOR AIR FORCE DAY ?

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*Ray Tracy*



*The*  
**ROUND**