

# The Prime Producers

Canadair Limited  
de Havilland  
Avro Canada  
Canadian Car  
Rolls-Royce  
Canadian P & W

**T**HE STARS of Canada's aircraft production program are the prime producers, though like all stars they don't get very far without strong support from the rest of the team. But this page and the half-dozen that follow deal with the names that most frequently make the news . . . the companies which, in the final analysis, must bear the heaviest responsibility for the success or failure of the aircraft production program.

The prime producers form the nucleus around which the Industry is built. This nucleus comprises Canadair Limited, A. V. Roe Canada Limited, Canadian Car & Foundry Co. Limited, The de Havilland Aircraft of Canada Limited, Rolls-Royce of Canada Limited, and Canadian Pratt & Whitney Aircraft Co. Limited. These major firms are located, with one exception, in either the Montreal area or the Toronto area. The single exception is Canadian Car & Foundry, situated at Fort William.

Between them, these six companies hold orders for the production of eight distinct aircraft types, two turbojet engine types, and one reciprocating engine type. Two of the engines are in production and six of the aircraft types. Work is proceeding to start production on the remaining engine and two aircraft types.

Briefly, here is a rundown on the aircraft and engines in production or on order:

**F-86 Sabre**—The F-86E is still in full production at Canadair Limited and at time of writing substantially more than 500 had been produced. It is expected that by the time the E has been phased out of production in favor of the Orenda Sabre (which will be known as the Sabre 5), something like 675 will have been built, of which 375 will have gone to the RAF under Mutual Aid. First Sabre 5 is due in June and it will be produced in sufficient numbers to replace all of the RCAF's present GE-J-47 Sabres.

**Lockheed T-33** — Production of this aircraft has just started to build up at Canadair Limited, the first aircraft having flown last fall and the first delivery being made during February. Work on this contract first started in September, 1951. Planned production rate is 40 per month. On order are 576.

**Beech T-36**—Yet another Canadair project, this aircraft is on order for the USAF. It has not yet reached the production stage and won't until late this year at least. A new design, it is being developed jointly by Canadair and Beech Aircraft Corporation of Wichita, Kansas. Construction on the first prototype is well advanced.

**Beech T-34** — Canadian Car & Foundry has a USAF order for an unspecified number of this light trainer, which is a development of the Beech Mentor, which in turn was a development of the civil Bonanza. Preliminary work on the contract is now under way, but first production is not scheduled until April, 1954. The T-34 has also been ordered into production in the U.S.

**DHC-3 Otter**—The de Havilland Aircraft of Canada's latest product is well into production, with four aircraft having already been delivered and two more to be delivered during March, one of these being the first RCAF Search & Rescue model. The RCAF's initial production order is to be raised considerably, since the Otter is to replace all of the Service's Norsemen. The aircraft is, of course, built on order for civil customers as well, and a number of such orders are currently in negotiation.

**DHC-2 Beaver**—This famous de Havilland airplane has been in constant production since 1947 and with substantial orders still on hand from the USAF and the U.S. Army (to whom it is the L-20), and civil orders still coming in, it will stay in production for some time yet. More than 500 civil and military models have now been built and delivered.

**CF-100** — By mid-February, 16 CF-100's had been delivered. Avro Canada is currently working on an order for 70 Mark 3's and when this is completed late this summer, the company will begin turning out the rocket-armed Mark 4 (see page 15, this issue) and orders for this version are expected to approximate 600-700.

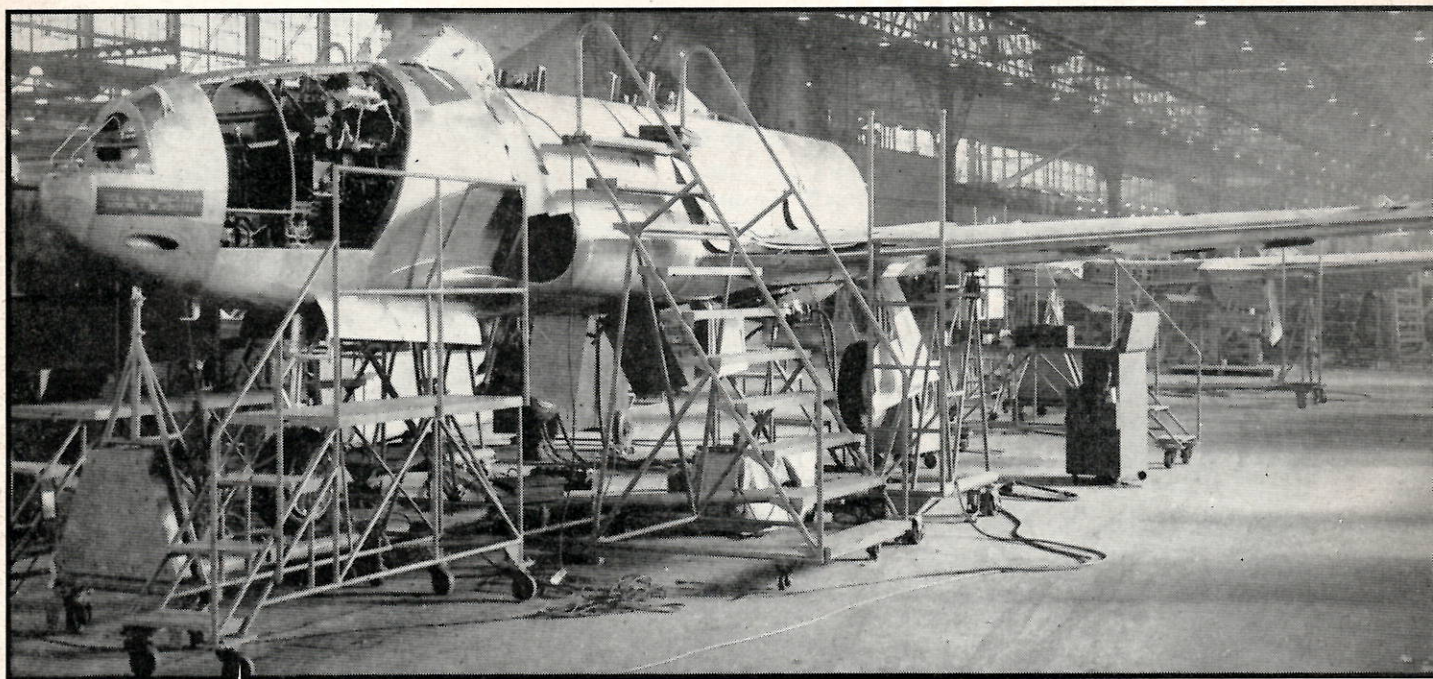
**Harvard 4** — Present production of this evergreen trainer is going to the USAF, who announced in a summary of defence purchases some months ago that it was placing an order for 263 aircraft, together with spares and ground handling equipment, the total value being more than \$33,500,000. An earlier order for 200 aircraft was placed in 1951 for the RCAF, and this has now been completed. This order was valued at \$13,000,000 (engines extra). Production rate is about 30 aircraft per month.

**Orenda**—Avro Canada's Engine Division has now built more than 200 Orendas in a variety of seven series, the latest of which to reach production being Series 8 and 10. Still officially rated at "over 6,000 lbs.", the Orenda has been developed far beyond this figure and it has been revealed that Series 11 has been up-rated to 7,500 lbs. The new plant is in full production and in fact has twice been added to since it opened last Sept. (*Cont. on page 75*)

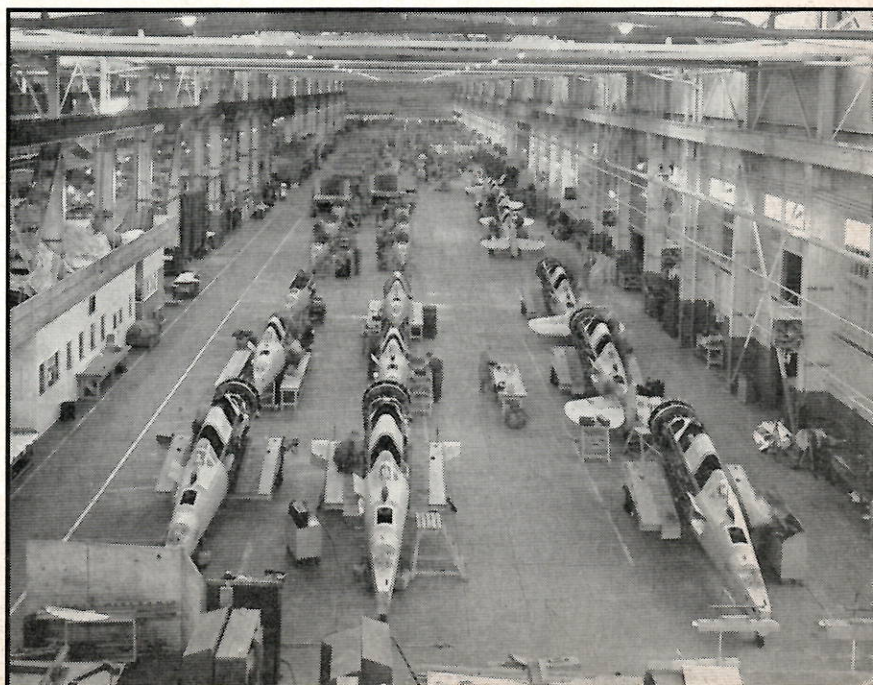
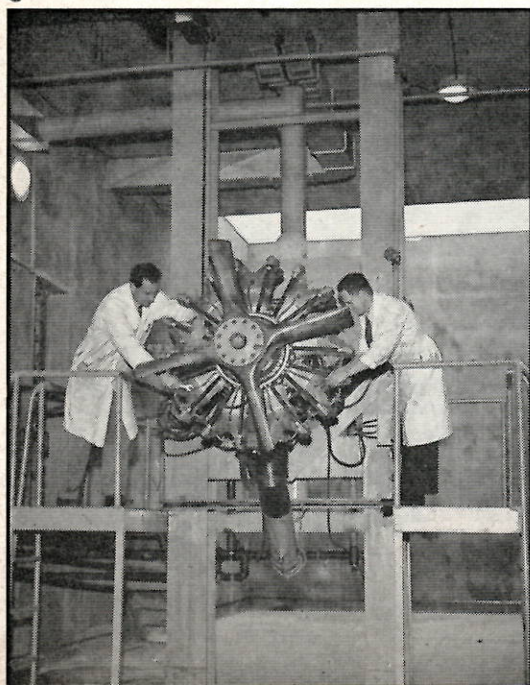




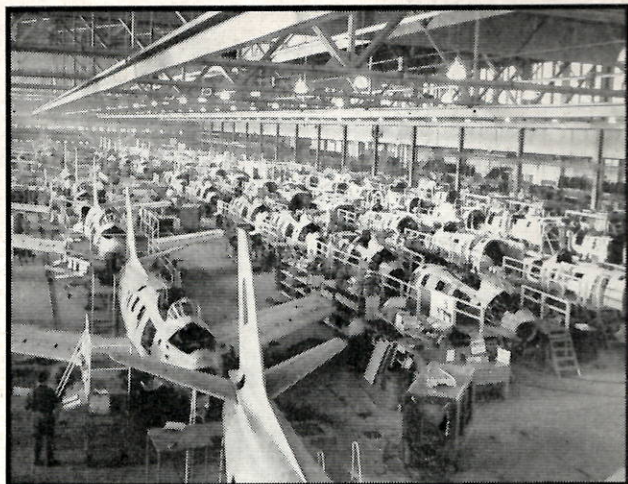
ABOVE IS THE DE HAVILLAND OTTER PRODUCTION LINE AND BELOW IS THE T-33 SILVER STAR PRODUCTION LINE AT CANADAIR.



BELOW LEFT, ONE OF THE FIRST R-1340 WASPS ON TEST AT CANADIAN P & W; RIGHT, HARVARD PRODUCTION AT CANADIAN CAR.







# CANADAIR

FROM CANADA'S TOP AIRCRAFT PRODUCER COMES FIGHTING AND TRAINING EQUIPMENT FOR RCAF, USAF, AND RAF

**I**N THE few years since General Dynamics Corporation (or Electric Boat Company as it was then known) bought control of Canadair Limited, the Canadian firm has gained the well-deserved reputation of having the ability to turn out complex aircraft with the facility of an expert cook cutting cookies out of soft dough.

Since that time, Canadair has grown prodigiously to the point where it dwarfs its parent company. It now operates two main factories, together with the recently acquired CanCar plant, all on Cartierville Airport, in addition to numerous factory locations spotted in and around Montreal. Recent additions to No. 1 plant bring the total amount of plant area under roof to an estimated 2,250,000 square feet. And while plant space has been growing, so has employment; now it has passed the 13,000 mark.

For the last two years the big production item at Canadair has been the F-86E, of which more than 500 have now been produced. The current production rate is 40 per month, a rate that will be maintained until the deliveries to the RAF are complete. At this point, the company will have built some 675 of the "E" model. As production on this model is tapered off the initial production of the Sabre 5—the improved Orenda powered version—will be phased in. The first of the new model is expected off the production line in June of this year. It is understood that the RCAF will replace all of its F-86E's with Sabre 5's, so that

all of its first-line aircraft will have a standard engine. This would indicate that Canadair will be expected to build at least 400 of the Orenda version.

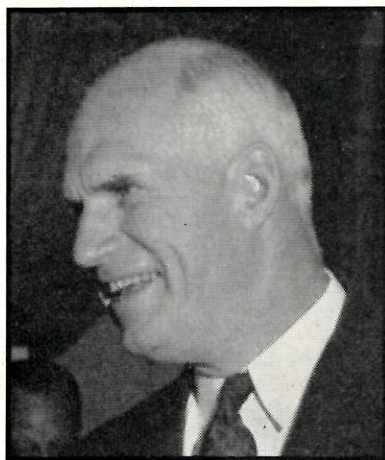
Equal in importance to the Sabre production job is the T-33A program, which has just started to roll and which will build up to a 40 per month peak. This contract is for 576 aircraft valued at \$100,000,000. The Canadair-built version of the T-33A differs from the U.S. version in that it is powered by a Rolls-Royce Nene 10, whereas the Lockheed version has an Allison J-33. The first aircraft under this contract was delivered during February, with the rate of delivery slated to increase rapidly thereafter.

Third largest project now under way at Canadair is getting the Beech T-36A into production for the USAF, a job which Canadair shares with Beech Air-

craft Corporation of Wichita, Kansas. At present the first prototype has not yet flown, but it is expected that actual production will be started soon.

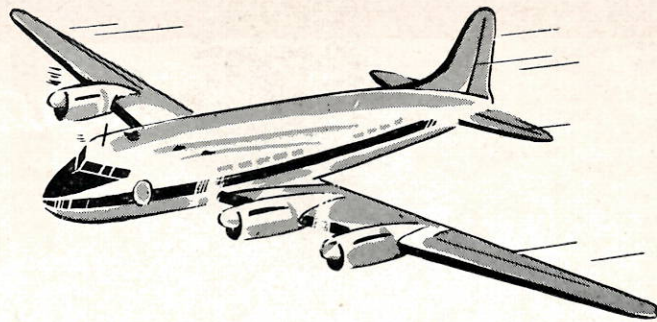
Besides these three big programs, Canadair has other irons in the fire. It is negotiating with The Bristol Aeroplane Company for rights to build the Britannia. With the RCAF interested in a maritime reconnaissance version of this aircraft, they could probably be produced in sufficient quantities to offer civil versions to TCA at an attractive price. The Canadian company has also conceived an original design, the CL-21, a feeder-line type intended as a DC-3 replacement. The work has advanced to the point where a wooden mockup of the passenger cabin and the flight deck was completed last year. A world-wide survey was carried out to sound out the market for such an aircraft, but at last reports analysis of the survey's findings had not been completed, so the decision whether or not to build prototypes is still pending.

Considerable bread and butter business continues to come from the sale of C-47/DC-3 spare parts, for which Canadair is one of the main suppliers, listing among its customers some 100 different air lines in 45 countries. Biggest buyer is the USAF. C-54 replacement parts also provide a substantial amount of business. Other miscellaneous, but highly important projects include the manufacture of cross-over exhaust systems for TCA, and experimental work on guided missiles for the Defence Research Board.



CANADAIR PRES. J. G. NOTMAN





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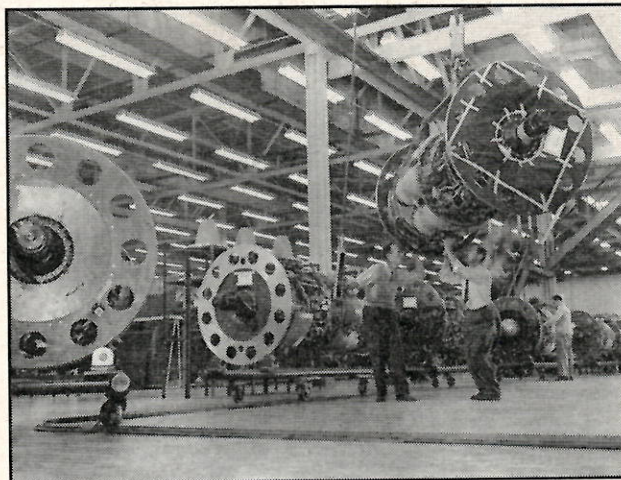
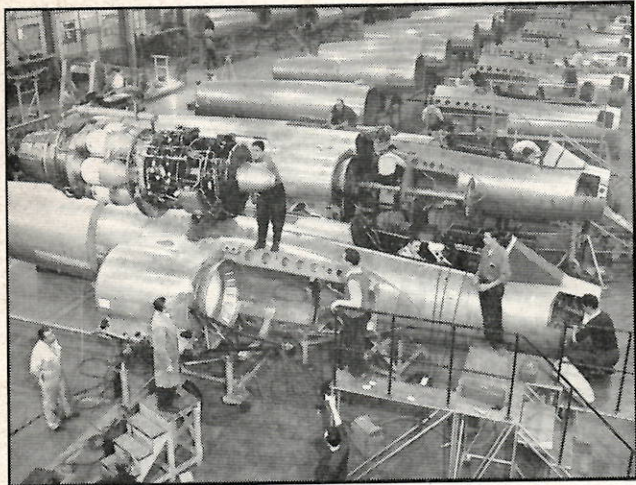


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# AVRO CANADA

**DELIVERIES OF ORENDAS AND CF-100's**

**RISE AS THE BIG BUILD-UP PAYS OFF**

**O**FT criticized Avro Canada seems to have got its house in order during the past year and, though actual recorded deliveries of completed aircraft are still on the low side (16, according to Mr. Howe), the pipelines feeding the sub and final assembly lines are full to bursting. The effect should be that the picture should change rapidly within the next six months, with deliveries of the 70 Mark 3 CF-100's being completed and output of the Mark 4 started.

In all, it is expected that the Aircraft Division will be called on to produce upwards of 650 CF-100 aircraft, practically all of them Mk. 4's. To help do this, a second CF-100 final assembly line is in the process of being set up.

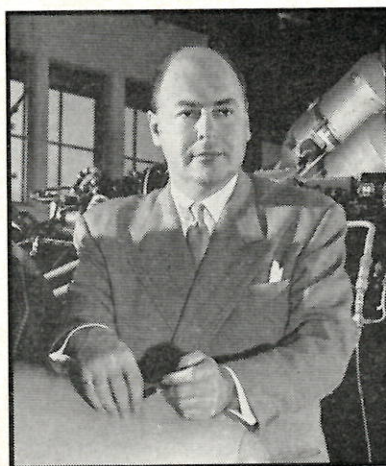
The Division has a total of 1,500,000 square feet of plant area and employs a constantly growing number of workers, now over the 8,500 mark. It has had to branch out from its main plant to find additional space for some of its projects. Across Malton Airport it has taken over four DoT hangars, where the Lancaster overhaul and conversion work is now carried on. In Leaside, near Toronto, a spare parts manufacturing and overhaul depot has been established and employs 200 on two shifts.

During the past year, the Aircraft Division has also completed the construction of two new hangars, each of 100,000 square feet. One is for expanding flight operations, the other for the production-line installation of the CF-100's radar equipment.

The Gas Turbine Division has got

its new plant into operation without delay. Its 4,500 employees are now turning out completed engines much faster than aircraft are being completed in which to instal them. Deliveries are being made to Canadair, where they are being stockpiled until production starts on the Sabre 5. Engines reaching the end of the production line have now passed the 200 mark by a comfortable margin. The engine plant has had two additions since it was opened last fall, bringing its total area up to something like 1,000,000 square feet.

Development of the Orenda continues at an impressive pace. In a recent speech Avro President Crawford Gordon, Jr., said that the current production version developed 6,500 lbs. th. "New models will give us 7,500 pounds and then 8,500. What is more, the Orenda can be developed to 12,000 pounds."



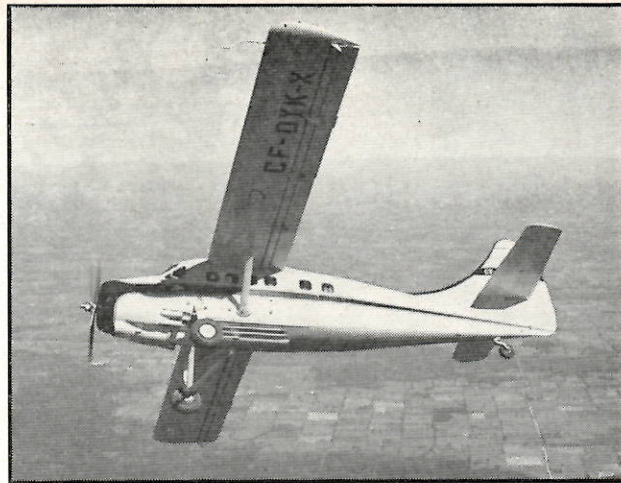
CRAWFORD GORDON, JR.

In the design and development field, Avro Canada has two projects in hand. One is the CF-104, a delta wing fighter of advanced design, on which the design work has been largely completed. It has not progressed to the mock-up stage and further work awaits the go-ahead from Ottawa, where the Government is wrestling with the question of whether or not to proceed with the fostering of original designs in Canada, as opposed to simply adapting other nations' designs to meet Canadian requirements.

The other project is one which the newspapers described as a "flying saucer" and a "gyro fighter". Most news reports were highly exaggerated, but at the same time they were ostensibly quite correct in their implication that a new concept of aircraft design is being investigated at Avro Canada, in collaboration with various Government research bodies. However, the indications are that the project is in the "thinking with a slide rule" stage. It is still only a research program, introduced with the view to developing new principles which will permit the designing of flying machines capable of vertical take-offs and yet able to fly supersonically in level flight. This is the sort of performance that proponents of the "convertiplane" in the U.S. hope to attain.

In the meantime, Avro Canada has a big job ahead to arm the RCAF with CF-100's. Its progress is satisfactory and improving in the Aircraft Division, and excellent in the Gas Turbine Division.





# DE HAVILLAND

MEETING THE DEMANDS OF A WORLD  
MARKET IS THIS CANADIAN GROUP

**T**HE "happy ship" of Canada's Aircraft Industry is without doubt The de Havilland Aircraft of Canada Limited. The combination of team spirit, high morale, ambition, and development & production achievement is indeed rare, yet all are to be found in full measure at de Havilland Canada, which is this year celebrating its 25th year in this country.

The continuing presence of these admirable qualities is directly reflected in the excellent record of the company. It would be redundant to dwell on the qualities of the Beaver, production of which has now passed the 500 mark, and which is in service in 23 countries on five continents. It is also the first Canadian-designed and manufactured airplane to be sold to the U.S. military services during peacetime. Used by both the USAF and the U.S. army, it is known to them as the L-20. Production of civil and military models during the year ended September 30, 1952, totalled 232,

The Otter is progressing satisfactorily and its reception indicates that it will be a worthy complement to the Beaver, rather than a replacement. Deliveries have now been made to (in order of delivery) Hudson Bay Mining & Smelting, Channing, Manitoba; Imperial Oil Limited, Calgary; Arthur Fecteau, Senneterre, P.Q.; Ward Air Services, Yellowknife. Deliveries are scheduled this month for Air Service Division of the Ontario Department of Lands & Forests, and for the RCAF. The latter will represent the first of a

series intended to replace the Air Force's Norsemen.

In this respect, 15 RCAF Norsemen have been sold to the Royal Norwegian Air Force and 11 of these are being completely overhauled at de Havilland prior to being sent to Norway. Similar treatment is being given to the other four by Canadian Pacific Air Lines (Repairs), Limited, at Calgary. These aircraft will be modified during the course of overhaul to comply with the latest specs.

Other projects include the completion of the RCAF contract to overhaul and modify some 41 Lancasters for maritime reconnaissance use. While this work is all but complete, it is thought that there may be an additional contract placed by the Air Force. The Vampire and Goblin overhaul work continues on a gradually diminishing basis, since Vampires are now in service

with reserve squadrons only and normal service attrition is gradually cutting down their numbers. Preparations are also being made to service the RCAF's Comets, the first of which is to be delivered this month.

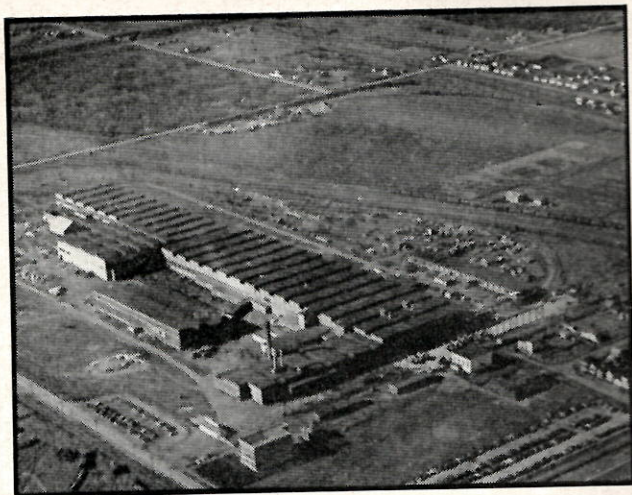
It is fitting that in this anniversary year, de Havilland should be getting a new home. The new plant will cost about \$7,000,000 to complete and will provide approximately 600,000 square feet of floor space, including that of the flight test hangar, on which construction was completed late last year. It is expected that de Havilland will be able to occupy the main factory by the year's end. The plant will be fitted with such modern conveniences as powered overhead doors and will be one of the most modern in North America. Bay No. 2, the overhaul bay, will have powered overhead doors at both ends and has been designed and built to handle efficiently such aircraft as the Comet 3 (as has the flight test hangar). The present plant has been bought by the Department of National Defence for \$5,000,000 and will be incorporated in the RCAF air materiel base which is being developed at Downsview. As part of the terms of the agreement with the Government, de Havilland was allotted 96 acres at the southwest corner of Downsview Airport on which to build the new plant.

Headed by P. C. Garratt, vice-president & managing director, The de Havilland Aircraft of Canada now employs some 2,200 persons.



P. C. GARRATT





# CANADIAN CAR

FROM CANCAR'S LAKEHEAD PLANT COME  
HARVARDS FOR AIRCREW TRAINING

CANADA'S northernmost aircraft manufacturing plant is the Aircraft Division of Canadian Car & Foundry Co. Limited, located in the lakehead city of Fort William. This plant is now the only Canadian Car facility manufacturing aircraft, the old Aircraft Division at Montreal having been closed and the buildings sold to Canadair.

However, a certain amount of aeronautical activity is still carried on in Montreal, where the Point St. Charles works manufactures propellers of Hamilton Standard design for use on Harvards, as well as undercarriages and other hydraulic units for use on the same aircraft.

At Fort William, the main effort is directed towards the manufacture of Harvard 4 aircraft and spares, the current production being to fill a USAF order for 263. An earlier order from the RCAF for approximately 200 aircraft has been completed. The spares work, which reaches a considerable volume, goes mainly to the RCAF, the USAF, and to a lesser extent overseas.

Under the present schedule, Harvard production will continue until February of 1954. Recently Canadian Car received a contract for the manufacture of Beech T-34 trainers for the USAF. Preliminary work is already under way on this contract, and first production is scheduled for April next year.

In addition to this work, tooling is going ahead preparatory to producing outer wing panels and engine nacelles for the T-36, on a subcontract from

Canadair. This program is just starting to get into production, and as production expands additional employees are being added daily to the present 1,800.

The plant in which all this activity is going on comprises a number of buildings, the largest of these being a three-bay main assembly building of 216,000 square feet and a prefabricating building of 112,000 square feet. In all, the plant has total available space, including office buildings, of 662,000 square feet. Besides these facilities, Canadian Car owns two hangars at the Municipal Airport, which is approximately 1½ miles by road from the main plant. These hangars total nearly 50,000 square feet in area.

The plant is well supplied with modern metal working equipment, including a machine shop capable of producing both tooling and production

machined parts. Other fabricating equipment includes a group of drop hammers, punch presses, spot welders, hydraulic presses, plus the usual sheet metal forming equipment such as brakes, shears, forming rolls, etc. The plant is also well equipped with metal treating processes such as heat treating, cadmium plating, anodizing, etching, etc.

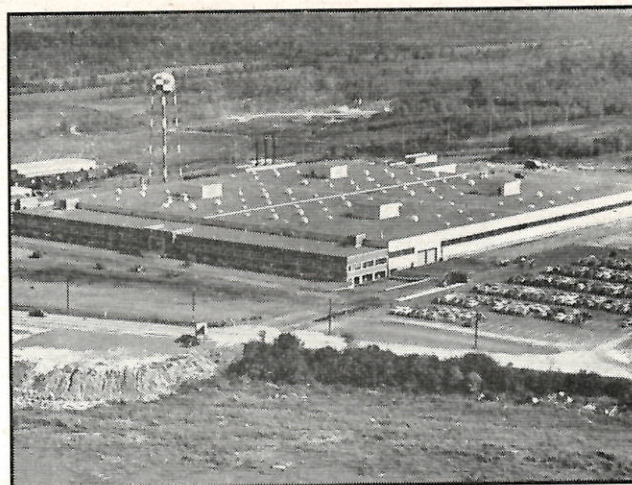
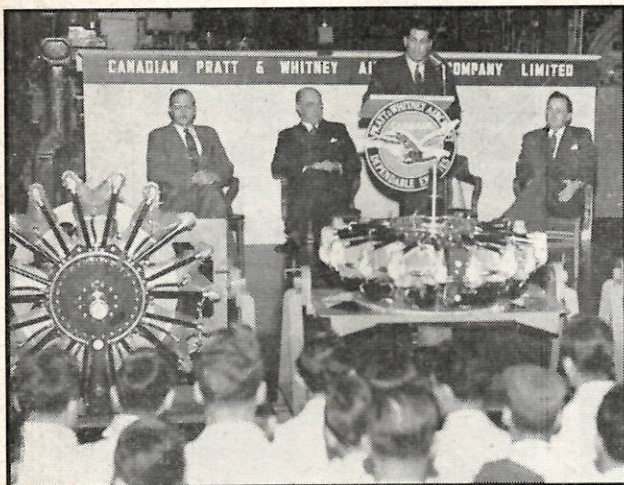
The plant in which the Aircraft Division is now located has a diversified history. Originally erected in 1917 for the purpose of manufacturing railroad cars and ships, it was shut down in 1925 for lack of work, remaining closed until 1937 when it was reopened for aircraft manufacturing on a limited scale. With the outbreak of World War II, an all-out aircraft production program was commenced, and from 1937 until August, 1945, the plant produced 1,650 Hurricanes and 836 Curtiss Helldivers. The Helldiver contract was originally for 1,000 aircraft, but hostilities ceased before the order was completely filled. At the end of World War II, the plant was already in the process of converting to peacetime production of buses and trolley coaches, and it is still employed in the manufacture of these products alongside the aircraft project.

The top management of the Fort William plant comprises Plant Manager R. E. Henderson and Division Engineer Lloyd B. Walker. The Sales Manager for the Division is L. H. (Les) Kottmeier, who is based at Can-Car's head office in Montreal.



R. E. HENDERSON





# CANADIAN P&W

**CANADA'S FIRST PISTON ENGINE  
MAKER GETS INTO PRODUCTION**

**L**ATE last year when James Young, chairman of the board of Canadian Pratt & Whitney Aircraft Co. Limited, pushed the button that started the first R-1340 Wasp to be made by his company's new Manufacturing Division, he was seeing the culmination of 25 years of work. For it was in 1928 that he resigned as vice-president of The John Bertram & Sons Co. Limited, and the Pratt & Whitney Co. of Canada Limited, to organize Canadian Pratt & Whitney Aircraft. He was president of the firm from the time of its inception until shortly after World War II, when he moved up to his present post and the presidency was taken over by Ronald T. Riley.

While this formal ceremony marking the completion of the first engines was held on December 30, the first two engines had actually completed their preliminary tests during the preceding week. Mr. Young's action really marked the start of the 150 hour qualification test, which is standard for units produced by a new manufacturing organization.

By the end of January, the first engines had been delivered for installation in the Harvard 4's being manufactured at Fort William by Canadian Car & Foundry. This meant that Canadian P & W was meeting the initial requirements of its contract with the Department of Defence Production more than three months ahead of schedule.

As Canada's lone manufacturer of reciprocating engines and in fact the one and only maker of the R-1340 "H"

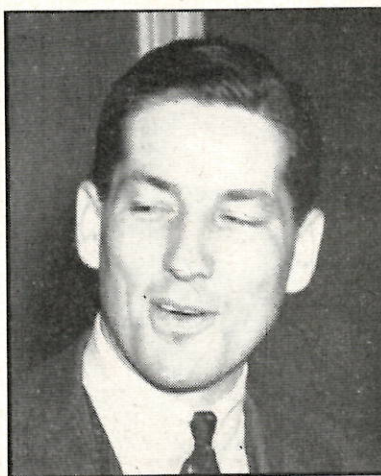
Wasp anywhere, Canadian Pratt & Whitney Aircraft has assumed new importance to the commercial and military aviation interests of not only Canada, but every other major country outside the "Iron Curtain". The engine is used in all the many variants of the T-6 (Harvard 4, USAF T-6G, USN SNJ) the Norseman, the Otter (a geared version), and the Sikorsky S-55. All of these, except the Otter, are now in widespread use. The number of T-6 aircraft in use alone numbers over 10,000. Consequently, though Canadian P & W now holds a production order for something like 1,000 complete engines, it is expected that long after this is filled, a large part of the new plant's capacity will be engaged in meeting the enormous demand for spares.

The new plant, located at suburban

Jacques Cartier, near Montreal, is of the most modern steel, brick, and tile construction and covers approximately 340,000 square feet of floor space. It is capable of expansion to four times its present size. Ground was first broken to start construction of the new facilities in June of 1951 and by May of 1952 the initial production operations had been started in the new building. Though deliveries of much essential machinery was slow, the bulk of the most vital machine tools is now on hand. Shortages of this equipment made it necessary for Canadian P & W to exercise considerable ingenuity to get the first engines completed.

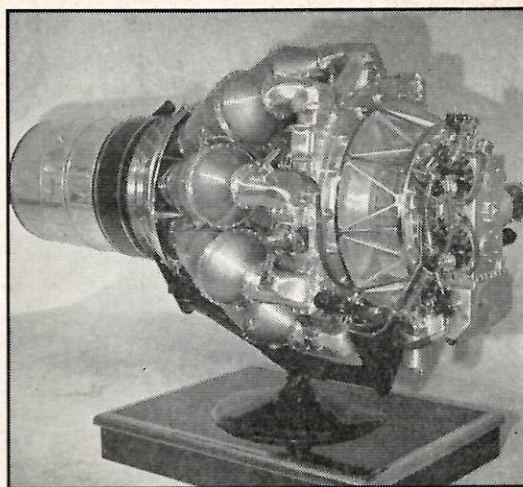
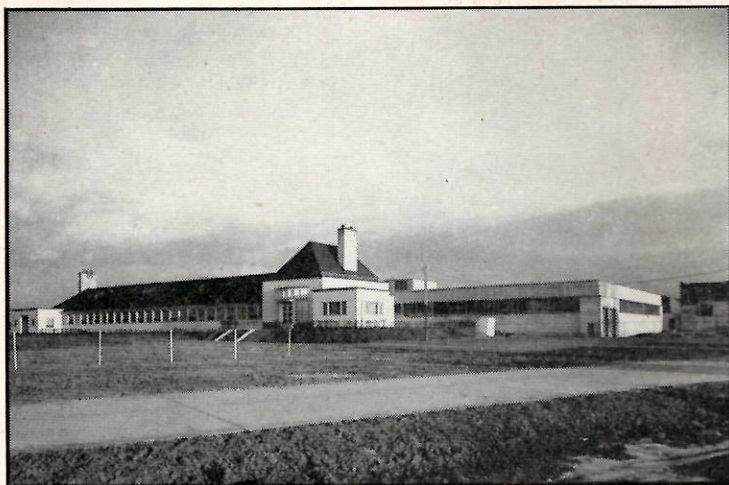
Present production schedules for the R-1340 use only a portion of the new Canadian facilities, which have a capacity of 300 engines per month. When added production is needed, output can be stepped up substantially. According to the company, the organization that has been established is capable of producing a wide range of aircraft engines and parts, and plans are already under way to develop production of Pratt & Whitney engines and parts other than the R-1340.

The Overhaul & Supply Division continues in full operation at Longueuil, about one mile from the Manufacturing Division. It employs approximately 500 persons on overhaul and servicing work, including the sales and service of all types of P & W engines, Hamilton Standard propellers, Sikorsky helicopters, and Pesco aircraft accessories.



RONALD RILEY





# ROLLS-ROYCE

**A NEW ENGINE PLANT BEGINS PRODUCTION**

**SOON ON NENE ENGINES FOR T-33 TRAINERS**

**M**ARCH is expected to see the inception of operations in the new 54,000 sq. ft. plant of Rolls-Royce of Canada Limited, holder of a \$33,000,000 contract from the Department of Defence Production for 900 Nene 10 turbojets. Rolls-Royce expects that deliveries of the engines should be completed early in 1955. For the most part, the engines will be assembled in Canada from parts supplied by the British parent company, but it is the intention to build a moderate number of engines of almost completely Canadian content.

Supplementing this initial order, Rolls-Royce of Canada has received a contract calling for the manufacture of Nene spare parts and for the overhaul of the engines. The company says that it plans to subcontract work in Canada as widely as is practical, a considerable number of such subcontracts having already been let, while others are in process of negotiation.

The introduction into TCA service of Dart-powered Vickers Viscounts in 1954-55 will require the establishment of a technical service and the provision of spare parts for the engines. Similar service has been provided for Merlin engines since 1947 and this will be continued.

When fully geared for its present program, the plant will employ between 300-400 men, all skilled or semi-skilled workers. The full build-up will take less than a year. The break-in will be a familiarization process for craftsmen, rather than a training program. Apart from a handful of U.K. person-

nel brought over from the parent company to form a highly technical nucleus, personnel will be recruited for the most part from the Montreal area. Employment has now passed the 150 mark.

Rolls-Royce of Canada Limited is a wholly owned subsidiary of Rolls-Royce Limited, Derby, England, manufacturers of aero engines since 1914. The Canadian company is the successor to Rolls-Royce Montreal Limited, incorporated in 1947 and until early 1952 operated at Montreal Airport as a service and parts stores organization for Rolls-Royce aero engines. Prior to the establishment of the Canadian branch, Rolls-Royce service representatives had been in this country since 1921.

Coincidental with the large Nene contract in late 1951, placed with the parent company, Rolls-Royce Limited decided to construct a manufacturing and assembly plant in Canada. In Feb-

ruary, 1952, ground was broken for the purpose of building this factory on Cote de Liesse Road, near Montreal Airport. By supplementary letters patent, the name of the Canadian company was then changed to Rolls-Royce of Canada Limited.

The factory is presently equipped for the manufacture and assembly of jet engines, full overhaul and maintenance, testing and service, and manufacture of spare parts. Making provision for possible future expansion, the company purchased 102 acres of land on the site of its initial move. In addition to the factory, a test bed building is being completed adjacent and connected to the factory, with the most modern devices for testing, including highly efficient silencers, being installed. Most of the plant will be ready for operation this month, while the first test cell of the test beds will be ready for use by April. The cost of the project is borne totally by Rolls-Royce.

In charge of operations at Rolls-Royce of Canada is Dr. Eric Warlow-Davies, general manager & chief engineer, who has been associated with Rolls-Royce since 1942, during which time he has held many important technical positions, including that of chief development engineer for the Derwent and Nene. Production manager is David Boyd, a well-known figure on Canada's aviation scene. He has been associated with the aircraft industry since 1937, when he joined Canadian Car & Foundry's Aircraft Division at Fort William as works manager.



**DR. ERIC WARLOW-DAVIES**



# Industry Elements

Repair and Overhaul  
Sub-Contractors  
Suppliers  
Equipment Manufacturers

*From Edmonton in the west to Eastern Passage on the Atlantic coast, the supporting elements of Canada's Aircraft Industry sprawl across the land. Their importance cannot be overestimated. Without them the prime producers could not produce; without them the RCAF and the RCN would soon find themselves with their unserviceable aircraft far outnumbering their serviceable ones. It is these supporting firms that are making Canada's Aircraft Industry self-sufficient, for it is they who are producing the items which before had to be obtained from other nations; it is they who have developed the most new skills, introduced new technological processes . . . the prime producers are mainly doing what has been done in this country many times before. In the following paragraphs are described the operations of some of the principal firms which answer to the name of "Industry Elements."*

## Standard Aero

**S**TILL actively engaged in carrying out \$2,500,000 in contracts for the overhaul of RCAF P & W Wasps, and of all types of accessories, Standard Aero Engine Limited of Winnipeg comprises a most important Industry component in Western Canada.

To carry out this, and a wide variety of commercial work for civil operators, Standard Aero employs some 150 persons and occupies approximately 40,000 square feet of plant space. Of this total, the main overhaul shop occupies 25,000 square feet, while the remainder of the space is used for storage of engines and cocooning work for the Air Force.

Standard Aero possesses one of the most modern engine and ancillary equipment overhaul shops in Canada. Bright and attractive in decor, it is outfitted with the most up to date in

tools and shop equipment. The company specializes in all types of small aircraft engines, ranging in size up to the R-1340 Wasp, and including the widely used Franklin, Lycoming, and Continental lines.

Established in 1937 as an additional activity of Standard Machine Works, a precision machine shop, the engine overhaul work grew steadily and following the end of World War II this phase of the company's operations was incorporated as a separate business which has since become known as Standard Aero Engine Limited. From the time of its inception until 1951, the aero engine activities were directed by C. F. Pearce, who retired as president at that time, being succeeded by E. H. Moncrieff. Mr. Moncrieff joined the firm early in 1950 as vice-president.

During the period of approximately 16 years it has been in operation, Standard has overhauled in excess of 10,000 engines and several hundred thousand accessories of all types.

## Fairey of Canada

**L**AST summer, The Fairey Aviation Company of Canada Limited, Eastern Passage, N.S., completed a major plant extension which increased its area to 210,000 square feet, nearly double its original size. This extension and steadily increasing activity resulted in considerable growth of the labor force, which rose during the year by more than 300, to 860 at the end of January.

There are now two main aircraft assembly hangars. The original one is used for the Company's program of converting Lancasters into long range navigational trainers for the RCAF, and of de-mothballing others, at the same time bringing them up to date to the latest modification standard.

The new hangar is 430 feet long by 130 feet wide, and is used for anti-submarine Avenger production for the RCN, which, in accordance with the Navy's active policy of keeping their Avenger aircraft right up to date with the latest anti-submarine search and strike equipment, goes from strength

to strength.

According to Fairey, these converted anti-submarine aircraft have more than fulfilled what was expected of them, having performed most successfully both in the 1951 and 1952 NATO exercises in competition with other aircraft types of the Western Nations. Their continued use for some time as front line aircraft can be confidently expected.

The Company is now establishing what has the appearance of becoming one of the best precision machine shops in the Maritimes, with the object of starting manufacture in 1953 of hydraulic flying controls.

Having now consolidated its position as an aircraft conversion and modification centre, Fairey is giving increasing thought to progress towards manufacture of complete aircraft, so as to give a self-contained manufacturing unit in Eastern Canada for dealing primarily with all aspects of anti-submarine work, which seems to be a logical defence contribution for the principal aircraft company of the Maritimes to undertake.

## Northwest Industries

**O**NE of Western Canada's two major aircraft overhaul, repair, and modification centres is Northwest Industries Limited of Edmonton. Located on the Municipal Airport, Northwest Industries has a main plant of some 140,000 square feet and in addition rents a large hangar for winterization work on the south side of the airport.

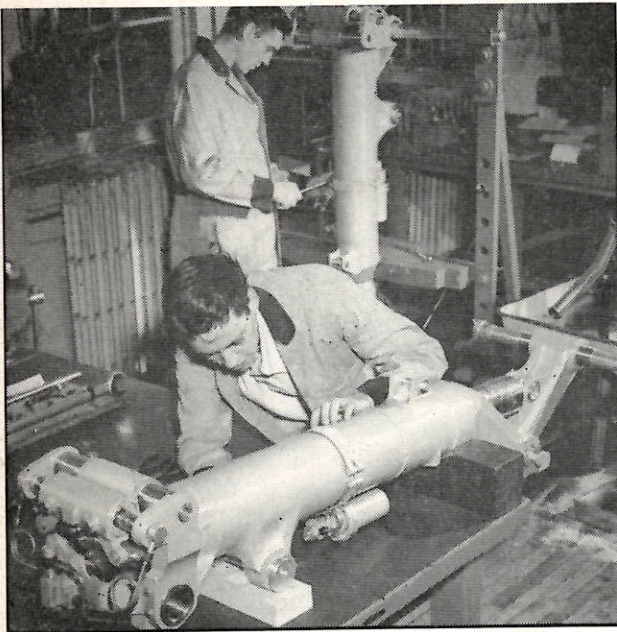
With a substantial volume of work now on hand and the promise of more to come, this Company should be increasingly active during the next few years. The present program involves the overhaul and repair of Dakotas, Harvard "B" crashes occurring in Western Canada, Mitchell B-25's, plus a contract to overhaul and repair Fairchild C-119's.

While the deal is not yet finalized, Northwest Industries is to be appointed the T-33 overhaul and repair base for

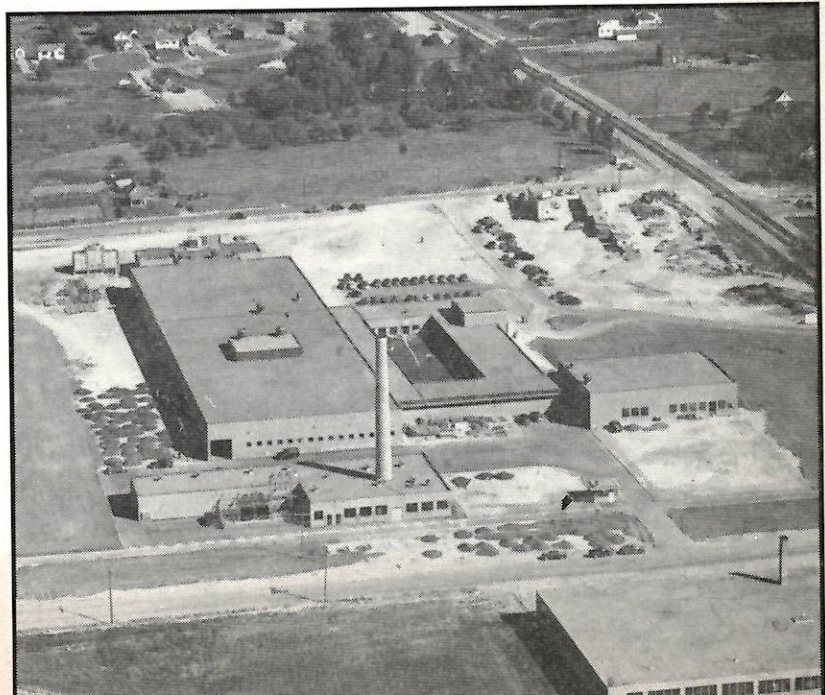




LIGHT ALLOYS, L, MAKES ORENDA COMPRESSOR CASINGS WHILE CANADIAN STEEL IMPROVEMENT, R, FORGES ORENDA BLADES.



ABOVE, CF-100 UNDERCART BY DOWTY AND, R, FAIREY PLANT; BELOW, L, GE J-47 OVERHAUL, AND NEW LUCAS-ROTAX PLANT.





Western Canada. It is understood that this will mean that Northwest will be responsible for this work on all T-33's operated in the West.

During the past year two Bristol Freighters were modified for the RCAF and currently winterization is being carried out on 70 B-25 Mitchells, this work including the installation of Janitrol heaters.

Other work for the RCAF includes instrument overhaul, repair of miscellaneous spares and accessories, inhibiting and preservation of aircraft engines and other major equipment stored in reserve.

The labor force of approximately 850 is headed by B. W. Pitfield, vice-president and general manager. Gordon L. Best is plant manager.

#### MacDonald Bros. Aircraft

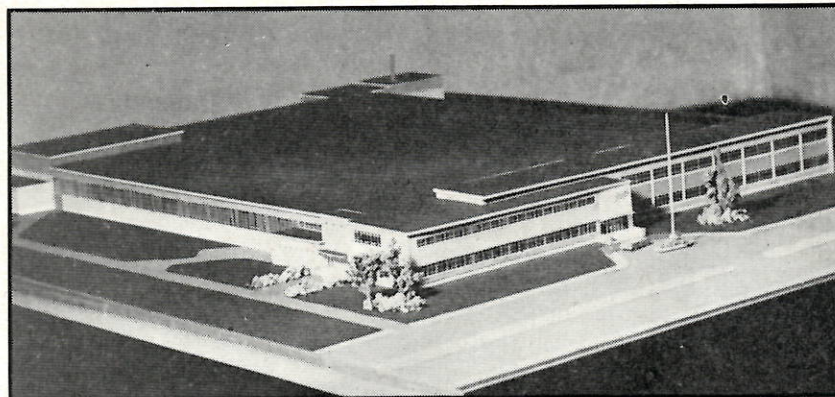
**T**HE DIVERSIFIED production program at MacDonald Bros. Aircraft Limited has included aircraft overhaul for the RCAF and manufacturing work subcontracted from principal aircraft concerns in Eastern Canada. Commencing with the production of seaplane floats in the depression era of the 1930's, expanding as a military aircraft contractor in World War II, successfully overcoming the problems of the reconversion period, and now participating in developments in the turbojet field as well as overhaul work on modern aircraft, MacDonald Bros. has gained recognition as a permanent unit of Canada's Aircraft Industry.

The plant is located at Winnipeg's Stevenson Airport and, during 1952, the number of employees increased to over 1,000, with productive floor space exceeding 200,000 square feet. Expanded activity is primarily due to a continuous program of airframe conversion and overhaul of Beech Expeditors, and F-51 Mustangs, plus accelerated production of welded stainless steel assemblies for turbojet and reciprocating aero engines.

Airframe Overhaul and Conversion—MacDonald Bros. plant is approved as a Beech certified service station in Canada and, during the past four years, the company has undertaken major overhaul of C-45 Expeditors, and this work is continuing. In addition, a quantity of C-45 Expeditors is being converted to D-18S trainers for use as navigation and pilot trainers. Work on Mustangs has included modification



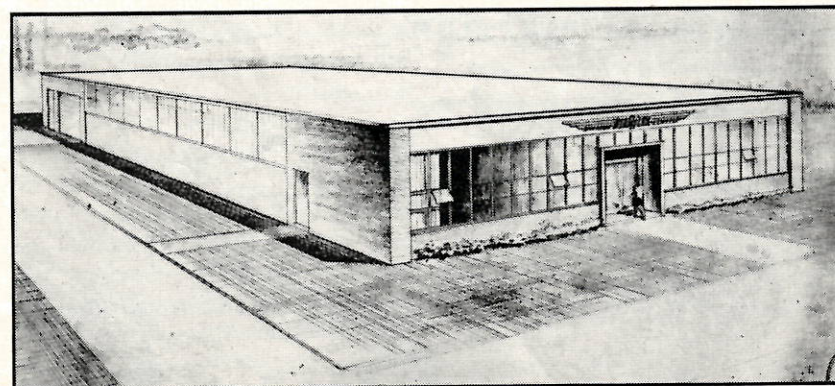
NORTHWEST INDUSTRIES PLANT AT EDMONTON.



NEW BRISTOL EASTERN ENGINE PLANT AT MONTREAL.

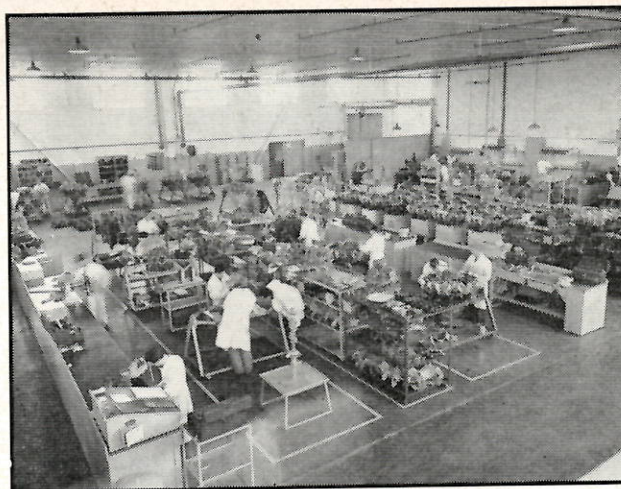
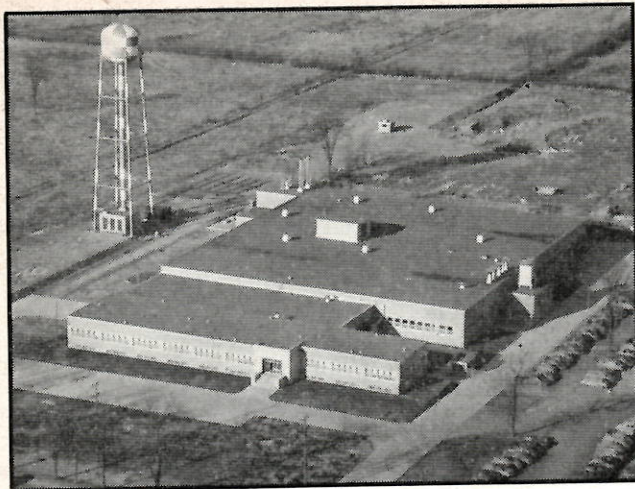


T-36 PARTS PRODUCTION AT ENAMEL & HEATING.



NEW CANADIAN DIAPHLEX PLANT AT TORONTO.





L IS SPERRY'S NEW INSTRUMENT PLANT NEAR MONTREAL WHILE R IS STANDARD AERO ENGINE'S OVERHAUL BASE AT WINNIPEG.

and weatherization for Canadian operation.

**Mustang and Mitchell Spares**—Supplementary to the airframe overhaul program, the company is manufacturing quantities of Mustang and Mitchell spare parts for the RCAF under license from North American Aviation Inc.

**Electronic Equipment**—A feature of modification work on both Mustang and Beech aircraft is the replacement of existing radio communication equipment with units of modern design. In addition to this work on airborne units, the electronics department carries out overhaul of RCAF ground station communication equipment, consisting of transmitting and receiving apparatus.

**Edo Floats**—The history of the company dates back 22 years, when it was first incorporated for the purpose of manufacturing all-metal seaplane floats under license from Edo Corporation of New York. Float production has been continuous since that time and over 750 installations have been made. Current production is largely for the Beaver and the Otter.

**Stainless Steel Components**—Manufacture of precision turbojet components for high temperature application is currently being carried out under subcontract from Avro Canada and Rolls-Royce of Canada. This work involves the production from stainless steel of the exhaust portion of the Avro Orenda, and exhaust unit for Rolls-Royce Nenes. Other stainless steel components are being built for piston type engines, including the exhaust tail pipe assembly for the Beaver, and exhaust stacks and shrouds for Mustangs and Mitchell aircraft. A 15,000 square foot plant extension has

recently been added to take care of the increased volume of stainless steel welded assemblies.

### Aviation Electric

**T**HE YEAR 1952 was notable for two important new developments at Aviation Electric Limited. The first was the completion and occupation of a new and modern plant, while the second was the inauguration of a manufacturing program for aircraft instruments. The new plant is located at 200 Laurentien Boulevard in St. Laurent, near Montreal. It provides a floor area of approximately 100,000 square feet and has been designed especially for the efficient overhaul and manufacture of aircraft instruments and accessories.

A program has been inaugurated to manufacture a number of different types of aircraft instruments and accessories. Of general interest to Canadian users among those units being produced are accelerometers, magnetic compasses, rate of climb indicators, turn and bank indicators, synchro pressure transmitters, synchro pressure indicators, suction throttling valves, restrictor valves, and miscellaneous aircraft accessories. Adequate facilities are being installed and staff trained to ensure that the quality of these products is in every way equal to those produced in the U.S. and the U.K.

The Manufacturing Division has been completely equipped with the latest precision machinery and test equipment, thus enabling it to produce not only aircraft instruments and accessories, but other precision components as well.

An Engineering Department has

been created to provide advisory engineering service not only to the manufacturing program, but to customers as well. When necessary, various items of equipment currently being sold by Aviation Electric can now be modified to suit individual customers requirements. In addition, where no adequate products exist to meet a requirement, these can now be engineered and produced.

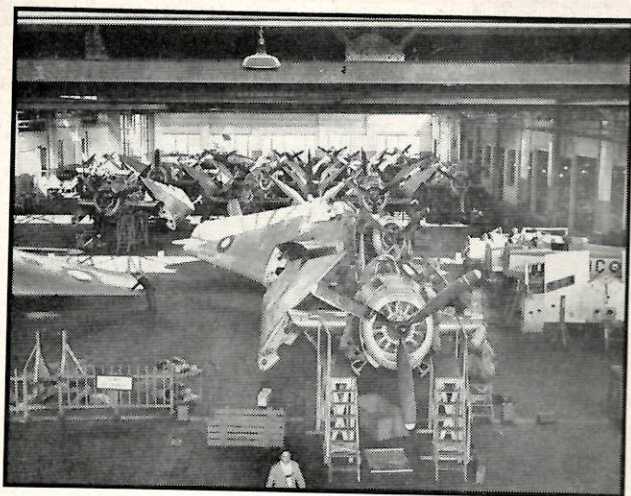
Overhaul activities have continued to expand to record levels to meet the requirements both of the services and civilian operators. Personnel have been trained and service facilities added to cover those new products which have been introduced into Canada during the past year. Facilities are now available for the overhaul of sealed aircraft instruments. In addition, oxygen test stands of a type suitable for testing the latest positive pressure breathing diluter demand oxygen regulators have been installed. A new phase of the overhaul program involves the overhaul of Bendix wheels and brakes used on F-86E Sabres.

Service activity in the field of aircraft maintenance problems has reached an all-time high with both the armed forces and civilian operators. Aviation Electric service representatives are now covering all parts of Canada.

Employment has continued to increase until there are now approximately 500 people in the various phases of the company's activities. It is anticipated that this figure will grow to approximately 600 by the time the manufacturing program is in full swing.

President and managing director of Aviation Electric is Alfred Bandi. Vice-president in charge of operations is





LEFT, AVENGER CONVERSION AND OVERHAUL AT FAIREY OF CANADA; RIGHT, INSTRUMENT OVERHAUL AT NORTHWEST INDUSTRIES.

Herman Wyler, while the general manager of sales and manufacturing is Joe Brian.

### Bristol of Canada

**T**HE BRISTOL Aeroplane Company of Canada Limited has started operation on an ambitious scheme for the boosting of its already extensive program in the development and expansion of its engine overhaul facilities in Eastern and Western Canada.

Visualizing a steadily rising market in the embryo Canadian aero engine industry, the Bristol group is preparing to make initial outlays in the many million dollar bracket in equipment and building facilities, organizational, overhauling and testing programs, increased machine shop work, and special accessory and component projects.

The Bristol Aeroplane Company of Canada, established in 1950, is a wholly owned subsidiary of The Bristol Aeroplane Company of England. Bristol of Canada was formed to make available to aviation in Canada the technical resources and aviation products of the parent company. The Bristol Aeroplane Company of Canada, which is itself primarily a sales organization, has two subsidiaries, Bristol Aeroplane Engines (Eastern) Limited, located in Montreal, and Bristol Aeroplane Engines (Western) Limited.

**Bristol Aeroplane Engines (Eastern):** With the increased tempo of military and civil aircraft operation, and the subsequent demands on engine overhaul services, Bristol's Eastern Limited is soon to move into new premises in Montreal North. The big new plant will cost in the neighborhood of \$3,000,000 and will be fitted with the

most modern equipment available for aero engine overhauling and testing.

The new layout will cover some 155,000 square feet. It is well under construction, with steel framework and reinforced "aerocrete" finish completed, and it is scheduled to start operating early this summer.

Thinking of the future, the company has purchased land amounting to approximately 23 acres—plenty, executives say, to take care of expansion needs for the next few years.

Eastern Limited is presently billeted in Montreal East and has a labor force which has grown to 550. Output of engines and powerplants during the past 12 months totals more than 1,000,000 brake horsepower. Many layout changes have been required to meet the large RCAF and RCN overhaul program on Wright 2600's and Rolls-Royce and Packard Merlins. Eastern's figures show a turnout of more than 80 engines and powerplants per month. This total is expected to jump to 120 per month in the new Montreal North plant, which will require the near doubling of the labor force to some 900 men on one shift.

In addition to its overhaul of engines and powerplants, Eastern Limited performs special accessory and component work which includes everything from cowlings to carburetors.

**Bristol Aeroplane Engines (Western):** In Vancouver, Bristol Aeroplane Engines (Western) Limited has recently completed an extensive reorganization and expansion program of shop and inspection facilities.

A carburetor and fuel injection test department, housed in a specially-designed fireproof building, has been

added to present facilities; a new propeller shop capable of handling the largest propellers in Canada has been installed, and tool room equipment has been improved.

At present, Western Limited is engaged on the overhaul of Bristol Centaurus engines for RCN Sea Furies, P & W and Wright engines for both the RCAF and the RCN, and propellers, fuel injection equipment and Rotol accessory gearboxes.

The modern engine test cells at Western are capable of testing the largest piston type engine now in Canadian use. The firm, situated on Vancouver International Airport, Sea Island, has shown a marked increase in the number of civil engines overhauled during the past year.

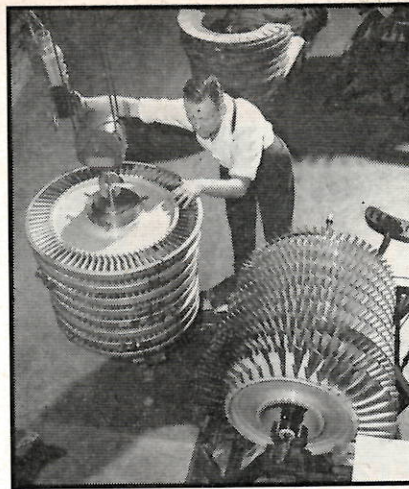
Apart from the operations in Canada of The Bristol Aeroplane Company of Canada and its subsidiaries, the parent company in the U.K. has also become associated in Canadian aircraft work by undertaking the responsibility for the overhaul and repair of the F-86E airframes and GE J-47 engines of the RCAF squadrons based in Britain.

### Dowty of Canada

**D**EAN of the aircraft equipment manufacturers in Canada is Dowty Equipment of Canada Limited, at Ajax, about 20 miles from Toronto. A subsidiary of Dowty Equipment Limited of England, Dowty of Canada is best known as a maker of quality landing gears, but like the parent company, its range of products takes in a prodigious variety of hydraulic equipment.

The major items now being manufactured at Ajax are complete landing gears, retracting mechanisms, hydraulic jacks, control valves, pressure release





ALL MADE IN CANADA: DUNLOP CF-100 WHEELS BY DOWTY; ORENDIA COMPRESSORS; ORENDIA FUEL PUMPS BY LUCAS-ROTAX LTD.

valves . . . in fact, a complete line of hydraulic valves and pumps required for any aircraft system. Most of the current production is aimed at meeting the requirements of the CF-100 program.

In addition to the manufacture of Dowty designed items, the Canadian firm is also manufacturing—under license for the Aviation Division of the Dunlop Rubber Company in England—wheels, brakes, and all the necessary hydraulic valve equipment for the operation of the brakes.

A most important and significant event in the coming year will be the installation of an undercarriage drop test rig capable of drop testing undercarriages for aircraft up to an all-up weight of 150,000 pounds. It will be complete with cathode ray oscillograph equipment.

This rig will provide a facility in Canada which does not at present exist, apart from a very small drop test rig located at the National Research Council's laboratories in Ottawa. Dowty feels that the new rig will fill a very necessary requirement for the development of undercarriage equipment in Canada. In line with this addition to the company's facilities, there will be an expansion of the technical and development staff.

In this respect, one of the interesting features of the Dowty operation is that the organization can undertake—from the early design stages of an aircraft—to design, develop, and produce the complete undercarriage and hydraulic equipment required for the aircraft in question, test it as a complete system, and supply the whole for installation by the aircraft constructor. This "pack-

aged deal" is followed with proper service representation at the constructor's plant and after-sales-service in the field, if the latter proves necessary. Such a packaged deal has been provided for the CF-100, which has a complete Dowty hydraulic system, including undercarriage.

Naturally, Dowty of Canada can also draw on the resources of the English parent company, which, in addition to producing undercarriage, hydraulic equipment, gas turbine pumps, and fuel systems for almost 80% of the aircraft in production in the U.K., has a large design and development facility.

The Canadian subsidiary was set up and operated in Montreal throughout the war years under the name of Dowty Equipment (Canada) Limited.

With the establishment of an all-Canadian Aircraft Industry some four or five years ago, Dowty Equipment of Canada Limited was formed at Ajax, and commenced operations in June, 1949. Present factory space is approximately 50,000 square feet, and expansion plans for this year involve the building of a modern addition of about 20,000 square feet to provide room for the growth of the assembly, testing, and office facilities.

Employees now number 300, headed by Vice-President and General Manager Robert F. Hunt. Mr. Hunt came from England to take up his present post after having been employed by the parent company in many branches of its activity for a period of 15 years. The whole of the engineering activity is under Director of Engineering Ian M. Hamer. Mr. Hamer worked with Dowty Equipment in England from 1940 to 1941 and throughout the rest

of the war years was chief engineer of the Montreal company.

#### Aluminum Company of Canada

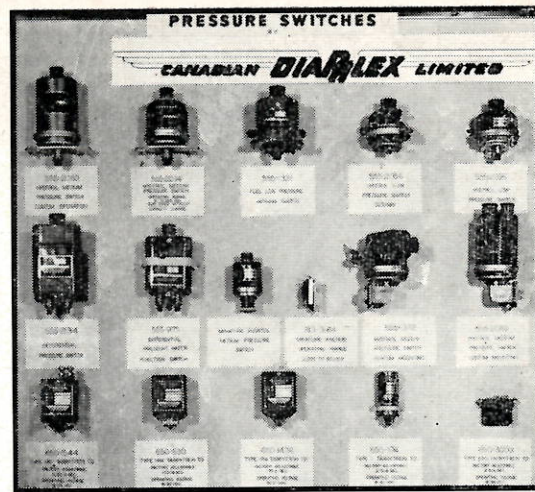
**D**URING 1952 about 50% of the aluminum consumed in Canada was used in defence and defence supporting industries — with the greater proportion of direct defence applying to aircraft production.

Participating prominently in Canada's growing Aircraft Industry is the Aluminum Company of Canada Limited. To prepare for its part in the rapidly expanding aircraft world, Alcan early undertook the development of new techniques. Company experts went abroad to study and explore the latest technological developments and adapt them to Canadian production requirements — increased existing capacities and added new fabricating facilities.

The rapid developments in aeronautics have brought about new materials requirements for modern high-speed jet aircraft. Alloys of greater strength are needed to meet higher stresses and the production of gas turbine aero engines required the development of both new alloys and new techniques. Production requirements called for new and intricate designs and exacting craftsmanship. The fabrication of sheet, extrusions, tubing, and forgings called for greater precision to meet increasingly rigid specifications both of alloys and designs and the resources and skills of the industry were called upon to produce aluminum materials to new and complex specifications.

To meet the growing demand of the Aircraft Industry, sheet and forging





LEFT, AVIATION ELECTRIC'S NEW AIRCRAFT ACCESSORY PLANT; RIGHT, SOME OF THE PRODUCTS MADE BY CANADIAN DIAPHLEX.

facilities at Alcan Kingston Works have been turning out increasing quantities of aluminum alloy materials. The extensive sheet rolling mills are largely applied to the production of aircraft sheet, at a considerable sacrifice to commercial production since high strength alloy sheet can be produced at only one-third the rate of common alloy sheet. A new extrusion press was installed at Arvida, P.Q., to handle the increased requirements of bar and forging stock. Magnesium smelting factories were quadrupled. At Etobicoke Works (near Toronto), magnesium and aluminum die, sand, and permanent mould castings are being turned out in increasing quantities.

#### Sperry of Canada

**N**OW in full operation is the modern instrument manufacturing plant of the Sperry Gyroscope Company of Canada Limited, completed last Spring. Located in the Montreal suburb of St. Laurent, it has an area of some 85,000 square feet and will soon employ 600 persons on the production of a complete line of aircraft instruments, including compasses, directional gyros, and artificial horizons. The new plant was completed within 12 months of the start of construction, and the first shipment of Canadian manufactured products was made within 10 months of receipt of the first production order.

Since its formation in 1950, Sperry of Canada has handled in Canada the sales of marine and aviation equipment of Sperry Gyroscope Company of Great Neck, N.Y., and Sperry Gyroscope Company Limited of England. It also represents Kollsman Instrument Corporation and is licensed to produce Kollsman equipment in Canada.

An affiliate, Sperry Gyroscope Ottawa Limited (formerly The Ontario Hughes Owens Co. Limited) carries out an extensive repair and overhaul operation for Sperry marine and aeronautical equipment and the products of a number of other companies. Comprehensive test and overhaul facilities at the Ottawa plant are supplemented by limited manufacturing areas where a number of special items are produced.

#### Lucas-Rotax

**S**INCE last year Lucas-Rotax Limited has completed and occupied its new plant in Scarborough, near Toronto. Production operations on the numerous aviation products that Lucas-Rotax is manufacturing are well advanced, and during February the first Canadian-manufactured Orenda fuel pump was completed.

This most modern of manufacturing plants now employs approximately 500 persons, a figure that will build up to a total of about 1,000 towards the end of 1953, when peak production on all scheduled items is expected to be attained.

The air conditioned plant has 120,000 square feet of manufacturing area which is being utilized to produce the fuel system for the Orenda, the fuel system for the Rolls-Royce Nene, the Rotax cordite-actuated Turbo-Starter, the electric starter for the Nene, the starting panel for the T-33, magneto parts, and spares for Rotax and Lucas equipment already in use in Canada. In addition to this list of aircraft engine ancillary equipment, Lucas-Rotax will manufacture the Demon Mk. 3 Burner for marine boilers.

Practically all of this equipment involves numerous precision machining operations, so the plant has equipment

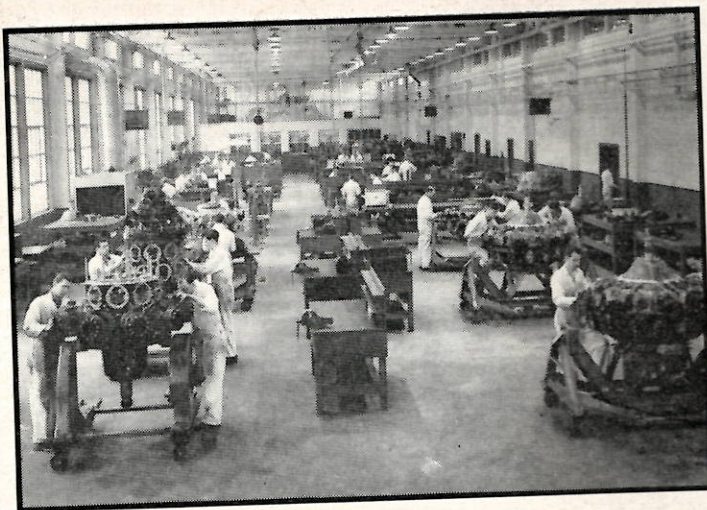
for air cleaning as well as air conditioning.

Apart from the Toronto establishment, the Montreal repair and overhaul centre continues in full operation. The Company recently decided to build its own quarters in Montreal to house the service centre and with this in view has taken an option on some suitable property. The new service centre, which will have in the order of 12,000 square feet of floor area, is to be erected in time to have work going on under the new roof by the end of the year. The building is to be so designed that it can be expanded easily.

Lucas-Rotax works in close co-operation with organizations with which it is affiliated in the U.K., Joseph Lucas (Gas Turbine Equipment) Limited, and Rotax Limited. The U.K. organizations do basic development and research for the Canadian organization. However, an engineering staff is maintained at the Canadian plant for the design and development tailoring of basic design to specific Canadian customer requirements.

As a means of training its own employees and also familiarizing members of the parent companies with the Canadian operation, an exchange program is being carried on whereby members of the Canadian subsidiary work in the U.K. for periods of several months, while members of the parent companies spend similar lengths of time in Canada. This serves the dual purpose of having production supervised from the first by skilled personnel familiar with Lucas and Rotax techniques, while the Canadians are learning these techniques in plants that are already in full production.





AT VANCOUVER, BRISTOL WESTERN OVERHAULS ENGINES; AT HAMILTON CUB AIRCRAFT FABRICATES CF-100 PARTS FOR AVRO.

### Canadian Aviation Electronics

A PRIME factor in meeting the demand for \$150,000,000 (of which \$125,000,000 will be spent in Canada) worth of electronic equipment for Canada's air defences is a postwar electronics prodigy, Canadian Aviation Electronics Limited, which has headquarters in Montreal. The last twelve months saw the firm expand from a staff of 250 to a staff of over 650, and floor space of 50,000 square feet to floor space of over 300,000 square feet.

At present, CAE operations in Montreal are scattered throughout the city in three different locations. However, a new head office and main plant is now under construction and will be occupied during the coming year. Outside of Montreal, CAE operates a western division at Winnipeg, where electronic equipment used by the armed forces in the Prairie Provinces is repaired, overhauled and modified in a 28,500 square foot plant. Other specialized precision electronic instruments with commercial applications are produced in the Winnipeg plant. One of these is a scintillometer, used for detecting radioactivity, and nearly 300 times as sensitive as a Geiger counter. There are also technical service depots at Toronto and Vancouver, as well as an overseas company based in London, England.

One of the products in which this company specializes is radar equipment. In fact, CAE's engineers have built and installed complete radar and communications systems north of the Arctic Circle and south of the equator. This was one of the first jobs that CAE carried out after its formation in May, 1947.

Among its aviation products is the Dahmel electronic flight simulator, which it is licensed to build under an agreement with the Electronics Division of Curtiss-Wright Corporation.

### Canadian Steel Improvement

ONE OF the most modern forging plants in the world is operated in Etobicoke, near Toronto, by Canadian Steel Improvement, Limited, a subsidiary of The Steel Improvement & Forge Company of Cleveland.

The Canadian plant was officially opened early in 1952 for the production of compressor and turbine blades for Avro Canada's Orenda. At the time of its opening the plant had 46,000 square feet of floor space and employed about 150 persons; these figures have now grown to 60,000 square feet and 300 persons respectively.

The plant is equipped with the latest designed drop hammers, electric heating furnaces, resistance upsetting equipment, and complete heat treating facilities. The most modern machine tools are used by Canadian Steel Improvement for sinking its own close-impression dies. The metallurgical laboratory is completely equipped for testing and research.

In detail, this is what Canadian Steel Improvement does: for the Orenda compressor, it forges aluminum alloy and stainless steel rotor and stator blades; for the engine's turbine, the company forges high-temperature alloy rotor "buckets".

The aluminum blades are precision forged to size. On the forged stainless steel compressor blades and turbine rotor buckets, a controlled amount of

stock is allowed for machining. The machining operations are carried out by other Avro Canada subcontractors.

### Aircraft Industries of Canada

AN AFFILIATE of The Babb Company (Canada) Limited, Aircraft Industries of Canada, Limited, is a major overhaul and repair centre for RCAF Harvards, as well as a variety of other types of military and civil aircraft. The company has not enlarged its 85,000 square foot premises in the last year, but its staff has been increased from 250 to 300, to handle the growing volume of military and civil work (it is approved by the DoT for work on aircraft up to 35,000 pounds).

Aircraft Industries has a number of completely equipped shops for sheet metal, electrical and radio, fabric, wood, dope and paint, instrument, hydraulic, sand blast, Magnaflux, Magnaglo, and cable swaging.

### Prencos

PRENCO, Progress & Engineering Corporation Limited, is a leading Canadian manufacturer of aircraft hose lines to AN and MS Standards, elbow bend, flange fittings, and self-sealing couplings. In this regard, it is Canadian licensee of Aeroquip Corporation. No newcomer to Canada's Aircraft Industry, Prencos has been known for its products since it first established in Toronto in 1940.

In addition to its hose production, this company is Canadian licensee of all Koehler Aircraft Products, including the Spheroid Full Flow series, and distributor of Pantex high pressure relief valves. Production is also carried out on specialized ground





LEFT, AVIATION ELECTRIC INSTRUMENT OVERHAUL SHOP; RIGHT, EXPEDITOR OVERHAUL AND MODIFICATION AT MACDONALD BROS.

equipment for all three armed services.

In the immediate future Prencos is planning the introduction of a new hose coupling and several new types of aircraft hose. One of these is a double-wire braided flexible hose that can withstand 2000°F heat and high pressures for long periods of time. Another item soon to be introduced is a new flexible joint that can deflect 10 degrees to either side of centre and absorb  $\frac{3}{16}$  in. axial displacement.

Facilities of the plant cover complete machine shop requirements and a number of special purpose machines. Hose testing equipment enables testing of hose lines and hydraulic components up to 30,000 pounds, and a further impulse testing machine and other specialized equipment are due to be installed within the course of the next few months.

Prencos occupies a four-storey building in Toronto and employs approximately 115.

#### Canadian Diaphlex

ONE of the most recent newcomers to Canada's Aircraft Industry, Canadian Diaphlex Limited, is soon to open a modern single-storey factory in suburban Toronto for the manufacture of such products as hermetically sealed relays, thermal and mechanical time delays, pressure switches, and "Black Box" assemblies. In addition to the manufacture of these products, complete facilities will be maintained by Canadian Diaphlex for the overhaul and maintenance of equipment already sold in Canada by the parent company, Cook Electric Company of Chicago.

With this plant opening, another

step will have been taken towards the completion of the program to make Canada's Aircraft Industry independent of outside sources of supply. While the Canadian firm will operate independently of Cook Electric, it will provide Canadian customers with advance information on developments and new products from the parent company. Also available to Canadian Diaphlex are the facilities of the Cook Research Laboratories and the Inland Testing Laboratories, also a division of Cook Electric.

The high precision components made by these companies are already widely used on both civil and military aircraft, and in recent years they have found many applications on guided missiles and radar, as well as other electronic equipment.

#### Canadian Flight Equipment

CANADIAN Flight Equipment Limited of Cobourg, Ontario, describes itself as a manufacturer of aircraft components, the most important of which is the Martin-Baker Patent Automatic Ejection Seat. Canadian Flight Equipment, which is North American licensee for all Martin-Baker products, is to produce the Martin-Baker automatic seat for use in the CF-100 Mark 4. An earlier order for Mark 1 seats for the CF-100 versions preceding the Mark 4 has been filled for some time.

Until recently, the company's plant in Cobourg functioned mainly as a final assembly point for the seats, with the parts fabrication work being carried out by a number of subcontractors. However, with the installation of new machine tools and the imminent trans-

fer of operations to new, larger quarters (15,000 square feet), in Campbellford, Ontario, this picture is expected to change. By next year, most of the work will be carried out by the company on its own premises. Besides the new machine tools, the Campbellford plant will also have a salt bath for aluminum alloy.

The expanded facilities of Canadian Flight Equipment will enable it to undertake the production of precision machine work and precision sheet metal work for major aircraft companies, as well as other component manufacturers in North America and the U.K.

#### Light Alloys and Domal

DURING September of last year, the new Haley, Ontario, foundry of Light Alloys Limited was officially opened. Described as the largest magnesium foundry in Canada and the most modern on the North American continent, this government-financed facility was designed and built by Light Alloys primarily for the production of Orenda castings and aircraft components for Avro Canada. Haley is 72 miles west of Ottawa.

The site is adjacent to the plants of the parent company, Dominion Magnesium Limited, and construction commenced in February, 1951. Initial operation started a little over a year later, though the needs of Avro Canada were being met for some time previously by carrying out operations in other quarters at Renfrew, Ontario. The new 70,000 square foot plant has ultimate capacity estimated at 400,000 lbs. of light metal castings per month.

The plant, a single-storey structure,



is of steel and pre-cast concrete siding, with a pressurized ventilation system for fume removal. The layout has been designed with a view to maintaining the efficient production and inspection of high quality castings required by the aircraft industry.

Dominion Magnesium Limited, of which Light Alloys is a wholly-owned subsidiary, is primarily a producer of high purity magnesium, using the Pidgeon ferrosilicon process.

Magnesium, when alloyed with suitable elements, can be sand, permanent mould or die cast. It can also be fabricated by rolling, extruding, forging, and welding, and is the most readily machineable of all structural metals.

The extrusion plant, which has a yearly capacity of approximately 1,800 tons of magnesium extrusions, commenced production early in 1949. The main item of equipment is a 2400 ton Loewy press, which is capable of producing a wide variety of sections.

In addition to magnesium, Domal claims to be the world's largest producer of metallic calcium, made in the same plant by a reduction process similar to that used for magnesium. Titanium metal is also being produced in a pilot plant.

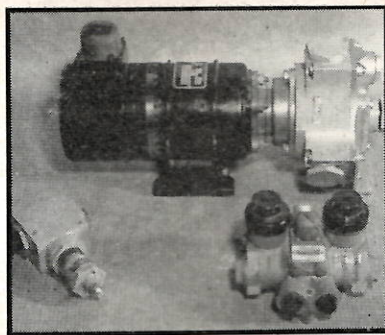
Combined payroll of Light Alloys and Domal exceeds 500.

#### Canadian General Electric

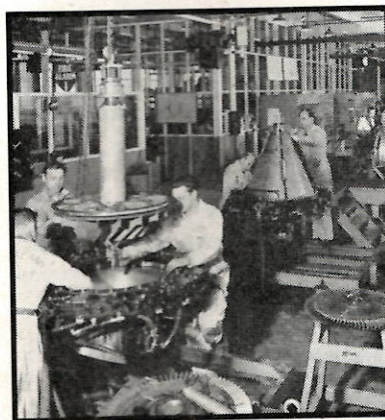
**A**T DOWNSVIEW, just outside Toronto, Canadian General Electric Company, Limited, operates a 72,000 square foot turbojet engine overhaul centre for the RCAF. This overhaul base, currently responsible for the overhaul of all the GE J-47 engines used in the RCAF F-86E's (except those overseas), will eventually perform similar work on the Avro Canada Orenda. In other words, it is to be the main overhaul base for axial flow turbojets.

The construction of the Canadian General Electric plant was started in March, 1951, and by June of 1952 engine overhaul work had started. The first complete overhaul engine was turned over to the RCAF in September and the flow has been steady since that time. Employment is well over 100.

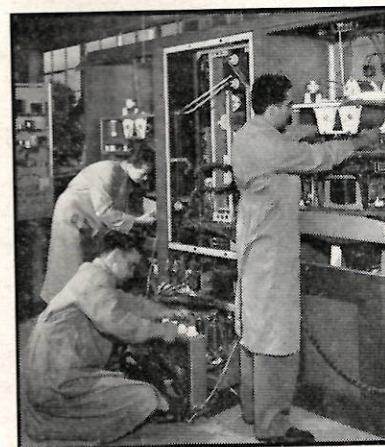
Canadian General Electric is participating in the airframe side of Canada's Aircraft Industry, too. At its Montreal works it is a major subcontractor to Canadair, producing components for the T-33 and the T-36.



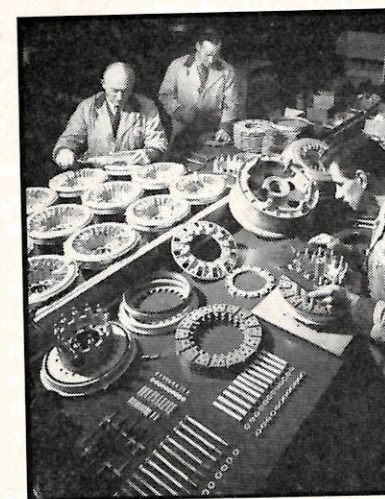
SOME DOWTY PRODUCTS.



DH GOBLIN OVERHAUL.



CAE OVERHAULING TRANSMITTER.



AEL OVERHAULING F-86 BRAKES.

#### Other Companies

•**Cub Aircraft Company:** This Hamilton, Ontario, company is a division of Transvision-Television (Canada) Limited, and is itself divided into three divisions — the electronic division, the tool & die making and fixture division, and the fabrication and assembly division. Subcontracts are carried out for Canadair, Avro Canada, Hudson Motor Car Co. of Detroit (who have subcontracted to Cub, items they have on subcontract from the Glenn L. Martin Company for items for the B-57 Canberra), The de Havilland Aircraft of Canada, and various other automotive contractors such as Ford of Canada, GMC of Canada, and Studebaker of Canada. Present plant area is 60,000 square feet and this is to be expanded during 1953 by 10,000 square feet. Current employment is 110.

#### •Godfrey Engineering Co. Limited:

A modern, well-equipped, 10,000 square foot plant operated at Lachine, P.Q., by this company. Employing about 40 persons producing cabin superchargers, cabin refrigeration units, pressure cabin testing trolleys, portable blower units, oxygen servicing trailers, shock strut chargers, and hydraulic hose testers. Godfrey manufactured equipment is used by TCA (cabin superchargers on North Stars) and in wide variety by the RCAF (including cabin pressurization equipment for the CF-100).

#### •Fleet Manufacturing Limited:

Soon to become one of Canadair's largest subcontractors, Fleet and Canadair recently completed an agreement whereby Canadair has taken over management control of the Fort Erie company. Though the top man at Fleet is now Canadair Purchasing Agent Herman L. Eberts, Canadair denies that it has assumed financial control of Fleet. For the past year or more Fleet has been subcontracting to Avro Canada, de Havilland and Republic. However, all of its 300,000 square foot plant will now be directed towards producing F-86 and T-33 components. Employment, now about 750, is expected to rise over the next few months to 1,200.

#### •Thompson Products Limited:

Manufacturing operations were recently started in the new Thompson Products plant, near St. Catharines, Ont. Designed primarily as a new manufacturing division for parts for jet aircraft

(Continued on page 76)



Over 85% of the torque wrenches used in industry are

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tracted to supply spares and carry out overhauls for these engines. The bulk of the contract will be an assembly operation, using British-made parts. Some of the last engines are to be of almost all-Canadian manufacture.

### SECONDARY COMPONENTS

(Continued from page 50)

engines, the \$6,000,000 plant started on this work in mid-February. While this company will do a substantial amount of work for Avro Canada, its main contract is for the production of parts for the Wright J-57 Sapphire (under license from Armstrong Siddeley). Official opening of the 150,000 square foot plant is to take place some time in April, by which time employment will have built up to about 600.

●**Genaire Limited:** This comparatively young firm has grown rapidly since it was established at St. Catharines about 18 months ago. It now employs approximately 150 persons and occupies some 25,000 sq. ft. of hangar space. It is engaged to a large degree in armament overhaul & repair, most of this involving bomb carriers. A substantial volume of overhaul & repair on miscellaneous aircraft components is also carried out. Other activities include a number of engine sectionalizing contracts and an active electronics section, as well as some helicopter development work.

●**Sanderson Aircraft Limited:** Sanderson Aircraft employs between 100 and 150 persons, about half of the staff being employed on the manufacture under subcontract to de Havilland of such Beaver components as flaps, ailerons, horizontal stabilizer and elevator, and vertical fin and rudder. Located on Malton Airport near Toronto, this company also carries out an extensive commercial business, for which it is completely equipped. This activity is carried out in a standard double hangar, about 10,000 square feet of which is devoted to the Beaver component program.

●**Chatco Steel Products Limited:** For 40 years a manufacturer of sheet metal products, Chatco became associated with Canada's Aircraft Industry about a year ago by undertaking the manufacture of a number of CF-100 components for Avro Canada, the largest of these being the rear fuselage section. Deliveries are now being made to Avro Canada at Malton. The aircraft program at Chatco involves about

1,000 persons. The company operates some 300,000 square feet of manufacturing space, with its main plant at Tilbury, Ontario, and branches at Chatham and Lindsay, also in Ontario. To carry out the Avro Canada subcontracts, Chatco has added aluminum alloy heat treat facilities, a 2,000 ton hydraulic press, magnaflux, zyglol, and routing equipment.

●**Cockshutt Aircraft Limited:** This firm is the renamed Aircraft Division of Cockshutt Farm Equipment Limited and is now located in new quarters at Renfrew, Ontario (formerly the Renfrew Machinery Company plant). Until late last year it had 40,000 square feet of manufacturing space in the parent company's plant at Brantford, Ontario; the new Renfrew plant gives it 100,000 square feet in which to produce combustion system components for both the Avro Canada Orenda and the Rolls-Royce Nene.

●**Technical Enterprises Limited:** This company is a small organization carrying out highly specialized work which includes sales, service, and installation of radio equipment in commercial aircraft. It produces such specialized low-production items as antenna test sets for the RCAF, as well as Anstat antenna systems. It is now in the process of moving into a newly-constructed 6,000 square foot plant at Toronto's Malton Airport. Employees number approximately 12.

●**Carriere & MacFeeters:** Specialists in the overhaul and repair of all types of aircraft electrical accessories, Carriere & MacFeeters employ about 50 persons and occupies some 5,000 square feet of shop space in downtown Toronto.

●**Field Aviation Co. Limited:** Field is contributing substantially to keeping the RCAF airborne by providing routine servicing and maintenance for all the Harvards, Dakotas, Mitchells, and Expeditors from RCAF Station Trenton. Employment is about 250, covering the company's extensive commercial commitments, as well as its RCAF work. Plant space is about 40,000 square feet.

●**Trans-Canada Air Lines:** At TCA's Winnipeg base, the air line continues to carry out the routine maintenance operations on RCAF aircraft (Harvards, Expeditors, and Dakotas) from RCAF stations at Winnipeg, Gimli, and Macdonald. Last year a total of 1,395 aircraft were put through the



maintenance routine. To carry out this work TCA employs about 100 men and uses two hangars.

•**Canadian Pacific:** Canadian Pacific Air Lines (Repairs) Limited carries out a program similar to those of Field and TCA in that it handles routine maintenance of RCAF aircraft. Its territory covers all RCAF stations west of Manitoba to the Pacific coast and north to the Arctic Ocean. From its Calgary base it also sends out a mobile crew which services aircraft in the field, as far as the head of the lakes. Its facilities were formerly the RCAF's No. 10 Repair Depot, on Currie Barracks Airport. A major project at this time involves the complete overhaul of four RCAF Norsemen which have been sold to Norway.

•**Also Contributors:** There are many other companies, large and small, which are contributing in varying degrees to Canada's Aircraft Industry. Some of these are: Roy Industries Limited of L'Assomption, P.Q. (rear fuselage of T-33 and T-36, Thor Canadian Co. Limited, Toronto (pilot ejection seats for F-86 and T-33, passenger seats for T-36); J. H. Connor & Sons Limited, Hull, P.Q. (tailplane for T-33, F-86 air intake ducts); Hussman Refrigerator Company, Brantford, Ontario (F-86 fuel drop-tanks); Jarry Machine Shop, Montreal (T-36 landing gear); Ford Motor Company of Canada, Windsor (T-33 landing gear); Canadian Vickers Limited, Montreal (F-86 landing gear); Liquid Carbonic Canadian Corp., Montreal (F-86 flying surfaces—slots, slats, stabilizers, etc.);

Western Propeller Company Limited, Edmonton (propeller overhaul and repair); Leavens Bros. Air Services, Toronto (aviation supplies); R & M Bearings Limited, Montreal (bearings); Inaerco Limited, Toronto (hydraulic hose lines and couplings); Radio Engineering Products Limited, Montreal (radios and service); Aviempo of Canada Limited, Montreal (aviation supplies); Canadian SKF Co. Limited, Toronto (bearings); Aircraft Appliances & Equipment Limited, Toronto (aircraft accessories); Radio Communications Equipment & Engineering Limited, Montreal (radios and service); Astrolante Instruments Limited, Toronto (instrument repair and overhaul); Abercorn Aero Limited, Montreal (aviation supplies); Crystal Glass & Plastics Limited, Toronto (cockpit canopies); Bancroft Industries Limited, Montreal (Aviation supplies); Duplate Canada Limited, Toronto (bullet-resisting wind screens); Atlas Steels Limited, Welland (stainless steel

in all forms); The Babb Co. (Canada) Limited, Montreal (aviation supplies, aircraft engines, aircraft components, etc.); Canada Wire & Cable Co. Limited, Toronto (aircraft cable); C-H Engineering Co., Toronto and Montreal (aviation supplies and aircraft accessories); Anthony Foster & Sons Limited, Toronto (aviation supplies); International Nickel Co. of Canada Limited, Toronto (nickel alloys of all types); Railway & Power Engineering Corporation Limited, Montreal (aviation supplies).

## INDUSTRY REPORT

(Continued from page 19)

the question now being asked is: Would Canada be better advised to stick to the building of other nations' designs, modifying them as necessary to meet Canadian conditions?

It is understood that Defence Production Minister C. D. Howe's think-

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