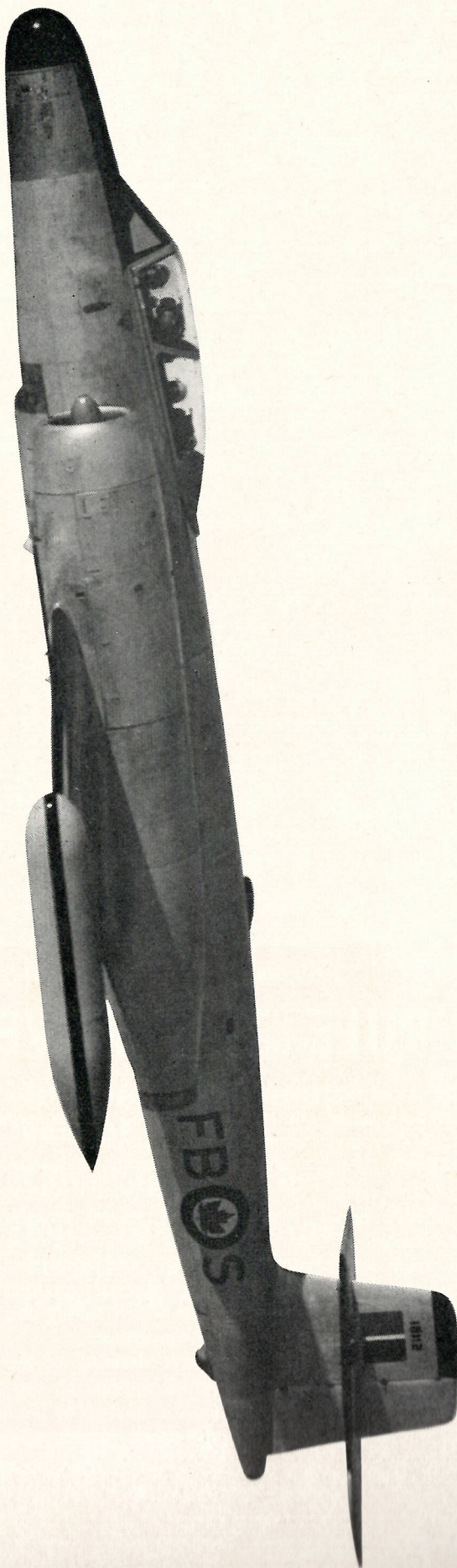


A Year of Progress Canada's Aircraft Industry



THE TWELVEMONTH past has been one of production achievement for Canada's Aircraft Industry. Though there was considerable output, especially of airframes, during a comparable period in 1952-53, it is only within the last year that the industry as a whole has really hit its stride. The numerous soft spots that were evident last March have now largely disappeared.

The big plant expansion program started three years ago has been completed, with the various new facilities now being in full operation. The only new building currently going on or planned for the near future involves comparatively minor plant additions. In short, the "crash" build-up of Canada's Aircraft Industry facilities has been completed. The tools are finished and in use.

The fact that physically the Industry has reached a plateau has been reflected in a levelling-off, and even a slight reduction in employment. An estimate based on figures obtained from the leading companies in Canada's Aircraft Industry indicates that there has been an overall drop of approximately 2,000 from the peak last year, when some 47,000 Canadians were directly employed in the building of aircraft, engines and ancillary equipment. It has also been estimated that an additional 20,000 persons are engaged in supplying the Industry with raw materials and a wide variety of proprietary items.

Although some part of the small working force reduction noted can be attributed to, in the main, the termination of the USAF's T-36 contract with Canadair, some significance may also be attached to the rising learning curve which, on an Industry-wide basis, is rapidly approaching its zenith. Jobs which a year ago took ten man-hours to complete, are now finished in eight. This is bound to have an effect on employment.

If the years between 1950 and 1953 can be described as years of growth, then 1953-54 has been a year of consolidation and increasing production. Indications are that 1954-55 will see all major phases of the current program at peak production.

Quantity production of at least six distinct aircraft types and two engines will continue throughout the year ahead, while a third engine will be built in limited numbers.

In the preparatory stage are production plans for two other aircraft types, with actual production airplanes still some time off.

For the future, the green light has been given on the design and construction of prototypes of a new all-weather fighter, and a big, powerful new turbojet.

Production for Aircraft Industry

In detail, these projects, present and future, are as follows:

Sabre 5 — In production at Canadair Limited, this is the Orenda-powered version of the F-86. Enough are to be produced to replace all the earlier versions of the Sabre now in RCAF service (probably about 500). Close to 1,000 aircraft of the Sabre series have now been built by Canadair.

T-33AN Silver Star — This Rolls-Royce Nene-powered version of the Lockheed T-33 is in quantity production at Canadair Limited. More than 225 have now been made out of the total of 576 called for by the RCAF. At the current rate of production, work on this order should be completed within a year.

CF-100/4 — Powered by Series 9 Orendas, this latest version of the CF-100 is being quantity produced by Avro Canada. Current rate of production is about one per working day with numbers of completed aircraft now having passed multiple squadron strength. About 600 Mk. 4's are on order. A total of 80 Mk. 2 and 3 CF-100's of earlier series have also been built.

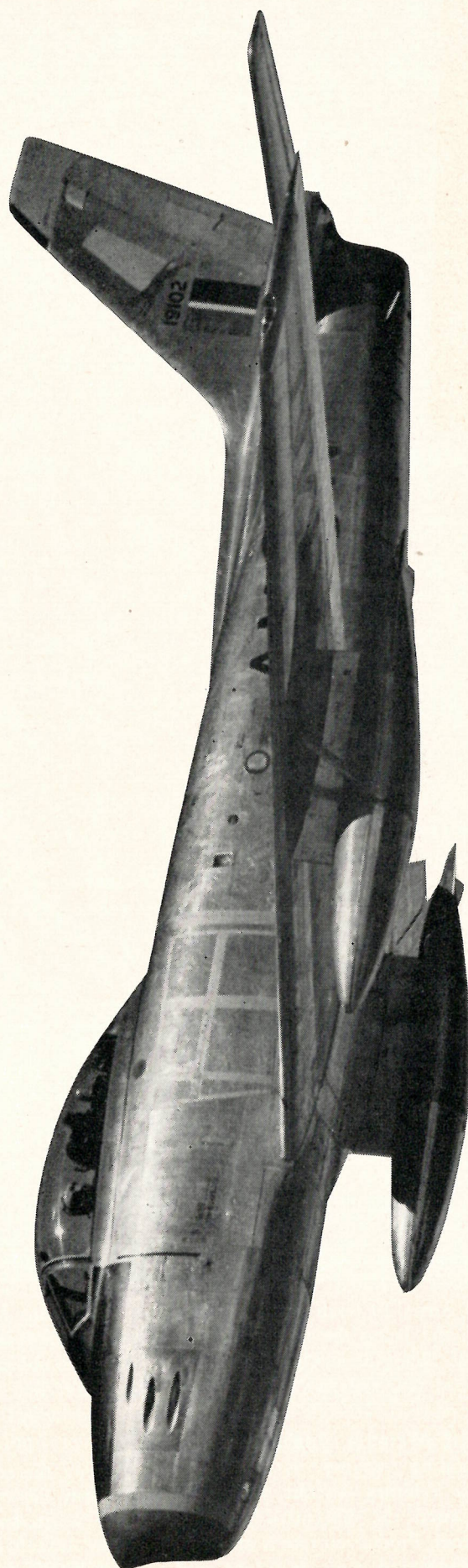
DHC-2 Beaver — Production of this versatile aircraft continues at a rate of about 15 per month, with a large part of this output going to the U.S. Services, to which it is known as the L-20. Over 600 Beavers have now been delivered since production started in 1947. The current U.S. orders are near completion, but additional orders from this source are a possibility as the L-20 has proved extremely popular with the USAF and the U.S. Army. Civil models continue to be sold all over the world.

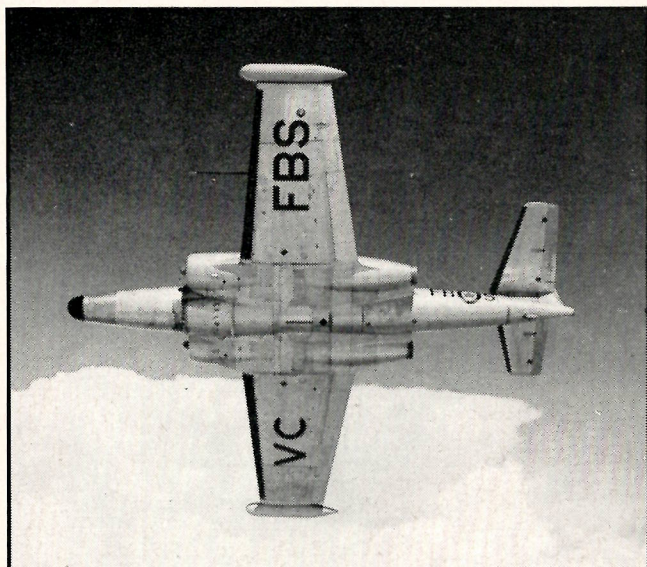
DHC-3 Otter — Production of this aircraft is still on a limited scale, with about 20 having been delivered, mostly to the RCAF. Considerable interest has been shown by USAF and the Royal Norwegian Air Force, but firm orders are still lacking.

T-34A Mentor — Being built under license from Beech Aircraft Corporation by Canadian Car & Foundry, the T-34A will start rolling from Can-Car's Fort William Plant late this month or early in April. About 200 are on order for the USAF and there have been reports that the RCAF will order 25 for trial purposes.

MR Britannia — The RCAF has ordered 50 maritime reconnaissance versions of the Bristol Britannia from Canadair Limited. A prototype should be flying in about two years.

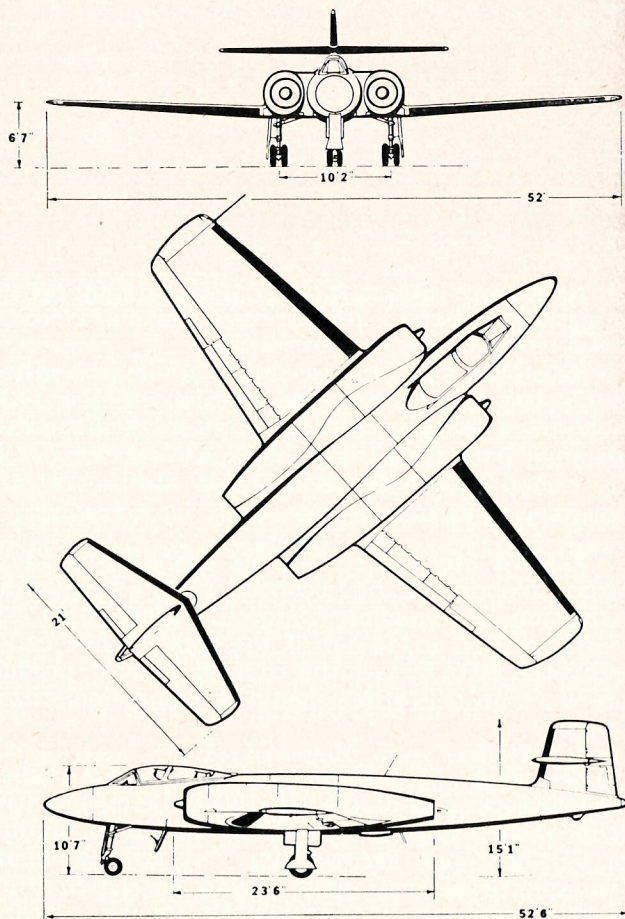
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The three-view drawing at right shows the dimensions and outlines of the Mk. 1, 2, and 3 models of the CF-100. The photo above shows the new Mk. 4. Main external difference between Mk. 4 and earlier versions is to be found in the nose, which is more bulbous and somewhat longer in the Mk. 4. Overall length of the Mk. 4 is about two feet more than other marks. The Mk. 1 was the prototype model (two were built

and one was destroyed in a crash) which was powered by Rolls-Royce Avons; the Mk. 2, five of which were built, was powered by Orenda 1's and was unarmed initially (it is understood that these have all been converted to dual-control trainers.) The Mk. 3 was the first armed version and is powered by Orenda 2's and 8's. The Mk. 4 has Orenda 9's of 6,500 lbs. static thrust.



AVRO CANADA CF-100

Grumman S2F—To be built for the RCN by The de Havilland Aircraft, according to a recent announcement by Defence Minister Brooke Claxton. Initial order will be for 100 aircraft, it is expected, with an additional order for 150 to follow. Many of the latter will be for Mutual Aid countries.

CF-105 — The Government has ordered the design and construction of a prototype of a big all-weather delta fighter, to be a successor to the CF-100. This will take about two years and production aircraft will not be available until 1958-59.

Orenda — Over 1,000 Orendas have now been delivered with the Series 9 and Series 10, each rated at 6,500 lbs. st. th., being the models in production. The Series 11 has been developed to 7,500 lbs. and work on higher powered versions is proceeding.

R-1340 Wasp — Producer of this reciprocating engine is Canadian Pratt & Whitney Aircraft, which has now passed the 300 mark in units completed. Production rate is about 50 per month and some 1,000 are said

to be on order.

Rolls-Royce Nene — Rolls-Royce of Canada will build only about 50 of these, with most of its production effort being diverted to the building up of a large bank of Nene 10 spares.

Wacanda — Though no official announcement has been made concerning the existence of this Avro Canada turbojet project, or the name by which it seems to be commonly known, industry reports indicate that it is in the advanced design stage, and that a prototype engine will be running within a year. Design engineers are said to be aiming at a thrust of 18-20,000 lbs.

These then, are the projects in hand or shaping up. Mention should also be made of the Harvard-Texan program, which is now practically completed at CanCar's Fort William plant, the final delivery being scheduled for March or April.

During the coming fiscal year, the Canadian Government will continue to be a free-handed spender insofar as the Aircraft Industry is concerned. The 1954-55 estimates recently made

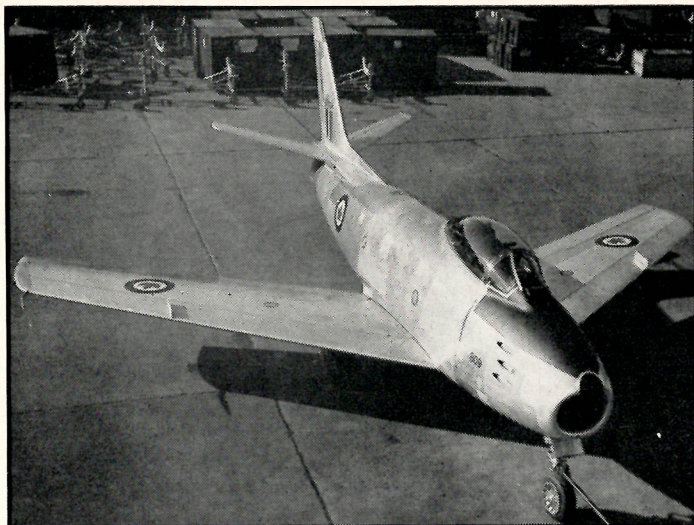
public indicate that procurement for the RCAF and for Mutual Aid be cut only slightly.

For instance, \$395,301,000 has been set aside for the purchase of new aircraft and engines for the RCAF. For similar purposes in 1953-54, \$420,232,600 was initially set aside, but this was later revised upwards to \$429,410,700. For armament this year will go \$2,552,000 (\$4,515,000)*; for signal and wireless equipment, which includes electronic gear of all types, \$30,111,000 (\$50,092,000), and for miscellaneous technical equipment, \$9,195,000 (\$12,838,000).

Special training equipment — this includes flight simulators, cutaway engines, and similar types of ground training aids for teaching both aircrew and groundcrew — will require \$10,665,000, up considerably from last year's \$7,823,000.

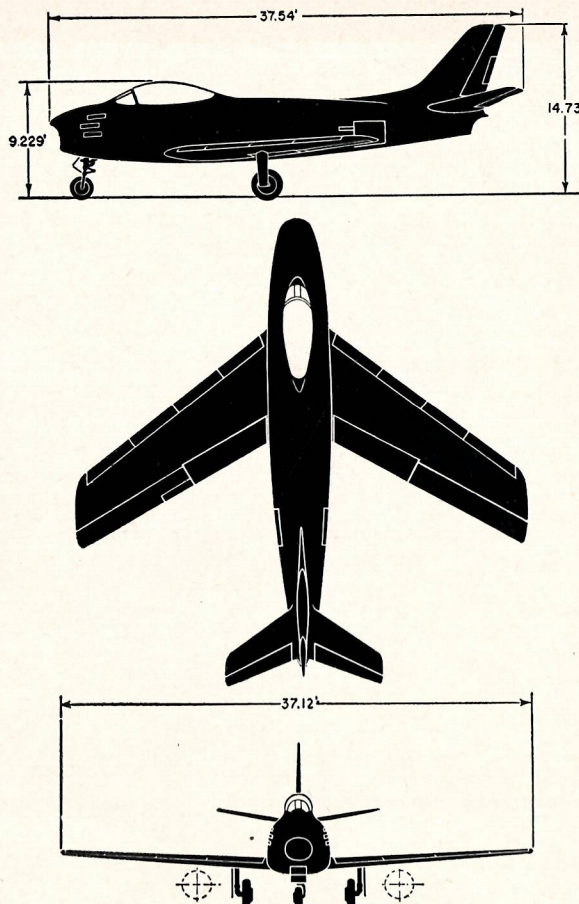
Repair and upkeep of equipment will get an increased allotment, \$124,947,000, which represents a rise of

*Figures appearing in parentheses are the comparable amount for the 1953-54 fiscal year.



Now in full production at Canadair is the Mk. 5 version of the F-86E Sabre, more popularly known as the Sabre 5. (The "5" is shown in the photo above; the three-view at left is of earlier versions.) The first of these improved aircraft are now going into service with the RCAF in Europe. The Sabre 5 is powered by an Orenda 10 of 6,500 lbs. st. th., which gives materially improved take-off and climb performance, as well as better performance at high alti-

tudes. Though the Orenda is only 121 in. long, as compared to 144 in. for the 5,200 lb. th. J-47, there is no noticeable difference in the external fuselage shape of new Sabre. The wing of the Sabre 5 has a "hard" leading edge, the slats of the Mk. 2 and 4 having been eliminated. The leading edge has also been extended at the root by 6 in., tapering to 3 in. at the tip. The new wing has small boundary layer fences on the leading edge of each wing, at about 2/3 span.



CANADAIR SABRE

about 22%. Most of this will go, of course, to repair and overhaul organizations.

Navy spending on procurement of aircraft and engines will increase many times this year, going from \$1,538,000 to \$23,538,000. However, practically all of this will go to the U.S. Government to pay for the McDonnell F2H-3 Banshees being purchased from the USN.

Most of the spending done in Canada by the Canadian Government on behalf of the Armed Services is divided among the six major prime contractors, who in turn spread the effect through their sub-contractors and suppliers. Eventually the money filters through practically every level of the nation's economy, some part of it, at least, returning to the pocket of that hard-pressed individual, the taxpayer.

Of these six major prime contractors — Canadair Limited of Montreal, A. V. Roe Canada Limited of Malton, Ontario, The de Havilland Aircraft Limited of Toronto, Canadian Car & Foundry Co. Limited of Fort William,

and Canadian Pratt & Whitney Aircraft Co. Limited of Jacques Cartier, P.Q. — four are engaged in airframe manufacture and these are reviewed briefly in the following paragraphs. The engine producers are discussed on succeeding pages.

Avro Canada

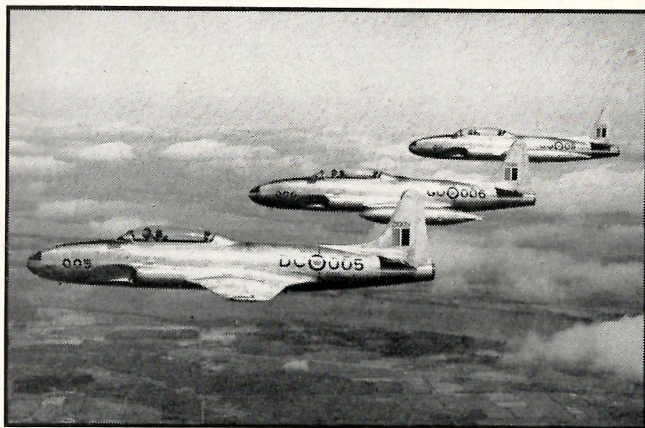
THE LOUD accusations of inefficiency and waste that 18 months ago were frequently directed against Avro Canada are now rarely heard. Indeed, it would be difficult to justify criticism on either count at this time, a situation that is due in no small part to the re-organization of the firm into two almost completely autonomous divisions—the Aircraft Division, and the Gas Turbine Division.

The Aircraft Division, whose branch of Avro Canada's operations came in for the hottest and most frequent criticism, is now clearly out of the woods. It is understood that production of the Mk. 4 CF-100 is on schedule, though deliveries are being held back while a major modification

to RCAF supplied equipment is incorporated at Air Force request. In all, over 600 CF-100/4's are to be built for the RCAF, a job that will take two years at a production rate of 25 per month.

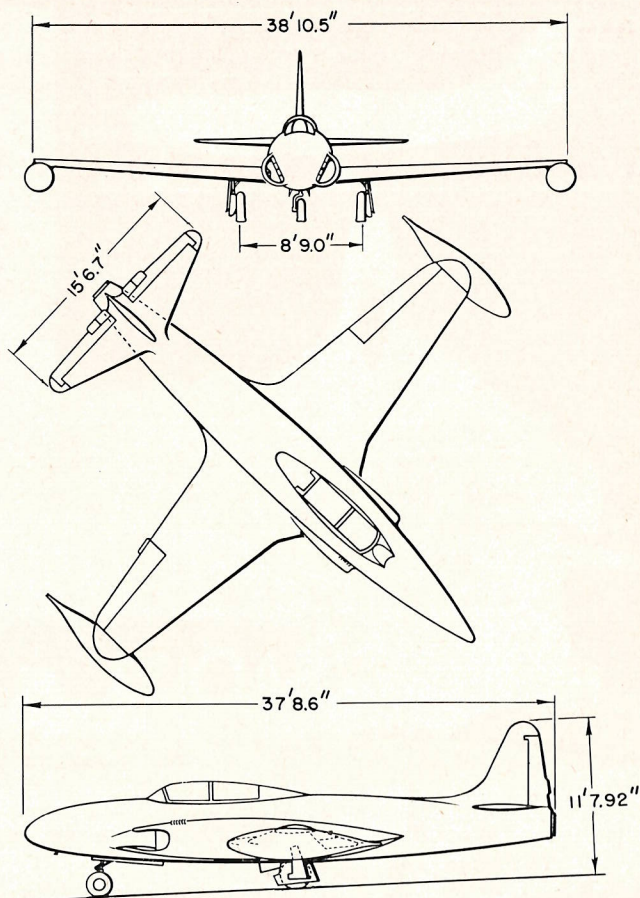
There are now two smoothly functioning CF-100 lines whose voracious appetites are being fed by Avro Canada's vast network of suppliers and sub contractors.

In Service: Now that the CF-100 has been in service for some time, in the Mk. 3 form at any rate, its qualities as a flying and fighting machine seem to be the subject of growing approval and even admiration. Though it has had its normal share of operational bugs, mostly of a comparatively minor nature, its serviceability record has been good and as RCAF ground crews become increasingly familiar with its anatomy, it can be expected to improve in this respect even more. In general, the Air Force seems well satisfied with the Avro Canada product. RAF and USAF officers on exchange duty with CF-100 units have spoken of the air-



The T-33AN Silver Stars shown above differ externally to no appreciable degree from the original Lockheed T-33A jet trainer illustrated in the three-view at right. The Canadair-built Silver Star has, of course, the Rolls-Royce Nene 10 as a powerplant while current Lockheed-built T-33A's are fitted with Allison J-33's. It will be noted that the cockpit canopy on the Canadair model is a single sheet of clear-view plastic, unbraced except by the outer frame; earlier U.S. versions, however, have a stiffener in

the centre of the canopy. The three-view shows the small 100 gal. auxiliary wingtip fuel tank fitted, but the RCAF version is normally equipped with the 200 gal. model. Standard armament for training purposes comprises two .50 in. calibre machine guns mounted in the nose. Rockets may also be carried. The T-33 has an all-up weight of 15,000 lbs.; an empty weight of 8,400 lbs.; a wing area of 237.6 sq. ft.; a maximum speed of approximately 600 mph. First production aircraft was delivered to RCAF, January, 1953.



CANADAIR T-33 SILVER STAR

plane in glowing terms, the worst thing that any one of them has said about being that he . . . "found it as good as anything comparable I have flown."

The Mk. 4 is not yet in squadron service, though it is undoubtedly available in squadron strength. However, it is safe to assume that it will be an even better weapon than its predecessor, since it incorporates numerous improvements in structure, systems, radar fire control, and armament, all of which have come about as a result of lessons learned with earlier equipment. As is well-known, the Mk. 4 is heavily armed with rockets. The ventral gun pack fitted with eight .50 calibre machine guns can also be carried to supplement the rockets.

Power is by two Orenda 9's of 6,500 lbs. th. each, in current production aircraft, but it is entirely possible the later versions may be fitted with the more powerful Orenda 11, which is rated at 7,500 lbs. Company officials have publicly stated that the Orenda is capable of development to 12,000 lbs., but it is a moot question

whether or not the CF-100 airframe could handle so much additional power without an uneconomic amount of aerodynamic redesign and structural modification.

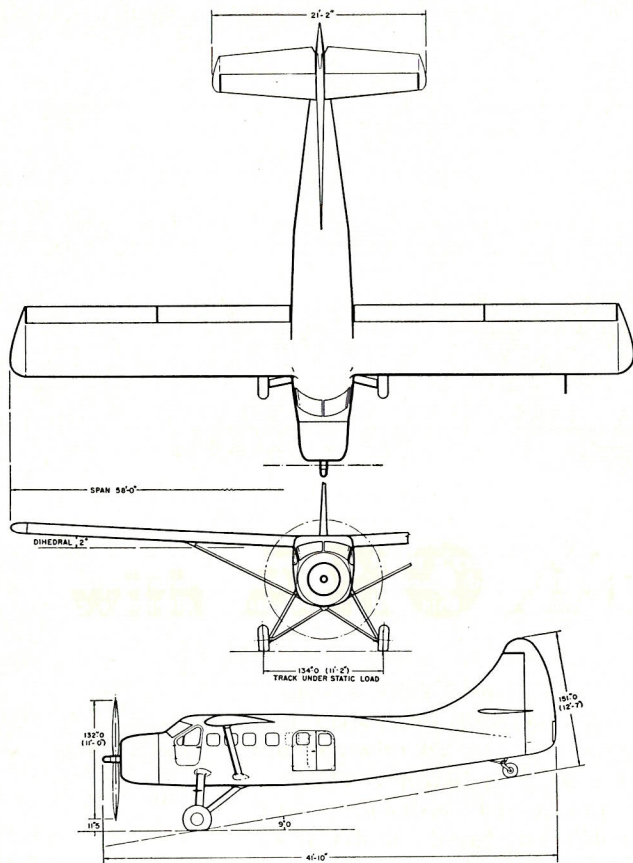
Fighter of the Future: The newest design project at Avro Canada's aircraft division is the CF-105, an advanced all-weather fighter type visualized as a successor to the CF-100 by 1958-59. The CF-105 design will utilize the delta wing plan. The aircraft design target speed is 1,200 m.p.h. maximum in level flight. Design gross weight has been calculated at a massive 68,000 lbs., surely making the CF-105 the heaviest fighter project in the Western world to be made public. The RCAF specification is also said to call for a range of 1,500 miles.

At the same time as Defence Production Minister C. D. Howe acknowledged that Avro Canada had been given the go-ahead on the CF-105, it was reported that the choice of powerplant (two engines will be used) had not yet been settled. Presumably no final decision will be reached until it can be seen how the

new Avro Canada "Waconda" shapes up.

Apparently only two prototype aircraft have been ordered and it is understood that Avro Canada is making strong recommendations to the government that this number be increased on the grounds that the loss of a lone prototype could set the airplane's development program so far behind that the time lost could never be fully recovered. There has also been some hint that the idea of ordering from the drawing board is being fostered in influential circles.

Place in the Sun: The importance and respect with which Avro Canada is regarded by the parent Hawker Siddeley Group was underscored last year when the Canadian company was chosen as the location of the annual conference of the Group's Design Council. At that time, Sir Roy Dobson, chairman of the board of Avro Canada and managing director of Avro Manchester, re-whetted the public and industry appetites for intimate glimpses of the future by saying in effect that Avro Canada was working on fantastic projects.



The Otter is the latest airplane to be designed by The de Havilland Aircraft of Canada to reach the production stage. About 20 have so far been delivered, mostly to the RCAF, which uses them for Search & Rescue duties, as well as a general utility aircraft. This aircraft now has a maximum gross weight of 7,600 lbs. and in spite of its size and weight, its flying performance is as good as, and in some respects, superior to, the frisky Beaver. Like the Beaver, the Otter is most at home on floats. Though primarily intended for use as a carrier of

bulky freight loads, the Otter can also fill in creditably as a passenger aircraft, with a seating capacity of 10 passengers, plus pilot. Powered by the Pratt & Whitney Wasp R-1340 S3H1-G, which develops 600 hp for take-off, the Otter cruises at 140 mph at 5,000 ft. asl at 65% power at max. gross (as a landplane; 130 mph as a seaplane). Basic weight, including 65 lbs. of radio, is 4,346 lbs. for the landplane freighter version, or 4,744 lbs. for the seaplane freighter. The landplane version can carry a maximum payload of 2,431 lbs.

DE HAVILLAND DHC-3 OTTER

Presumably this had reference to the so-called "flying saucer" design on which the Canadian company has done some work. At one point during the Council's visit to North America, one member was credited with denying that the design bore any resemblance to the "saucer" shape.

From the foregoing brief resumé, it is clearly evident that Avro Canada's Aircraft Division is a very active organization indeed. The Division has a whopping 1,500,000 sq. ft. of plant area and employs nearly 9,500 persons, most of which are at work on the production of CF-100/4's. It appears that the current employment level will remain relatively static for some time to come, though there has been some slight reduction in recent months. This reduction has been achieved mainly, however, by simply not replacing workers who leave the company's employment as the result of normal turnover.

Canadair

CANADAIR Limited is continuing to add new laurels to its impressive record of production achievement. Sabres are still rolling

from production lines and they are accompanied in growing numbers by Silver Star jet trainers.

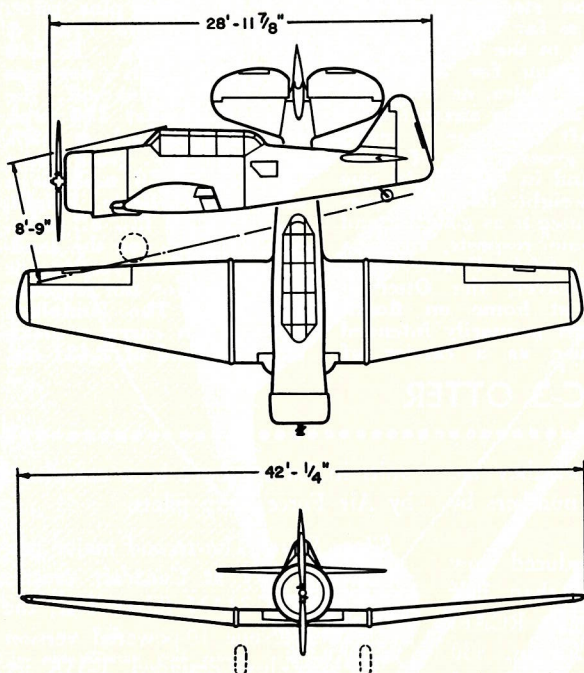
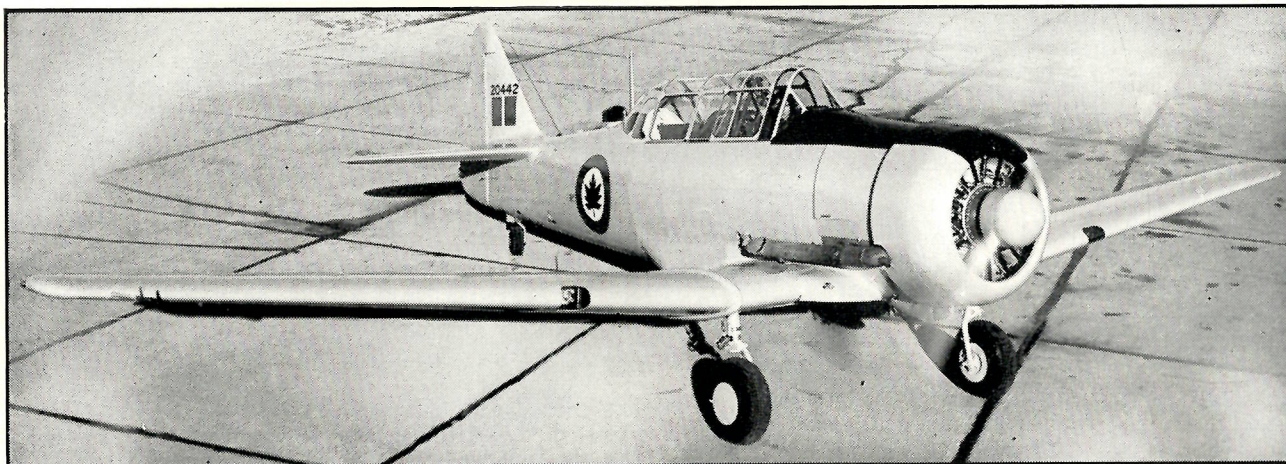
Numbers of Sabres produced now approximates 1,000, more than half of which have gone to the RCAF. According to Canadair figures, 430 of these have been built for Mutual Aid, while most of the rest have gone to the RCAF. Current production model is the Sabre 5, which has improved performance as a result of its more powerful Orenda engine (Series 10, 6,500 lbs. th.) and extended "hard" leading edge. This new leading edge replaces the automatic slats and is the same as the one first used on the F-86F in Korea. It improves performance at altitude and speed considerably, but only at the expense of control qualities in the lower speed ranges.

Enough Sabre 5's are scheduled for production at present to replace all the GE J-47 powered versions in service with the RCAF. There are approximately 350 of the latter in operation with squadrons of No. 1 Air Division alone and a substantial additional number in Canada. First deliveries of the Sabre 5's to RCAF

units in Europe have been completed by Air Force ferry pilots.

Silver Stars: The second major production activity at Canadair centres around the T-33AN Silver Star, the Rolls-Royce Nene 10-powered version of the Lockheed-designed T-33A jet trainer. The necessary modifications to adapt the T-33 fuselage to take the Nene were designed by Canadair. The extra thrust provided by the Nene takes the T-33's performance out of the marginal class, adding a few knots at the top end of the speed range and improving take-off and climb performance to a marked degree. The numbers of Silver Stars produced by the Canadian manufacturer now exceed 225.

There is no doubt that the cancellation of the USAF T-36A contract last year was a serious blow to Canadair and a number of its subcontractors. It resulted in a reduction of 1,500 in the work force to a level of less than 11,000. However, the impact of the cancellation was softened slightly by the receipt of a Canadian Government order at that time for additional Sabres.



Production of the Harvard is now all but completed at Canadian Car & Foundry's plant at Fort William and it seems most probable that this will be the last production run of the Harvard anywhere in the world. The Harvard was designed by North American Aviation, Inc., of Inglewood, Calif., and first flew in 1938 under the designation NA-16-3. It was popular from the very first and during World War II was built in the thousands. Noorduyn Aviation alone built 2,775 between 1941 and 1945 at its Cartierville Airport plant. The Harvard was put back into production again in 1951, with CanCar this time being the contractor. The first production airplanes from CanCar went to the RCAF, while the last have been for the USAF, to whom it is known as the T-6J; the latest RCAF model is the Harvard 4. The airplane has altered very little since it was first designed.

Aside from a major change of fuselage structure when the use of fabric covering for the fuselage was abandoned, early in the aircraft's career, modifications have mainly been confined to details. The Harvard 4 is recognizable by its large prop spinner and modified canopy, which has fewer upright stiffeners in it. The engine used has always been the reliable Pratt & Whitney R-1340 Wasp. The Harvard has an all-up weight of 5,245 lbs. and an empty weight of about 4,000 lbs. Max. speed at critical altitude (5,000 ft. asl) is 206 mph while it cruises at 180 mph. Landing speed is 66 mph; service ceiling 23,000 feet; normal range, 730 miles. The version now going out of production at Fort William is of almost 100% Canadian content, with the engine, propeller, undercarriage, propeller governor, and hydraulic equipment all being made in Canada.

CANADIAN CAR HARVARD

More recently, it has been announced that Canadair will develop and build a maritime reconnaissance version of the Bristol Britannia. A total of 50 are to be produced initially and the contracts in connection with this work will have a value of \$185,000,000. Necessary design work has already started on the MR Britannia, which will be the largest aircraft ever built in Canada.

Guided Missiles: Another project in which Canadair is playing a leading role is the development of a guided missile for the RCAF. A prototype missile was fired from an aircraft for the first time last August, when a successful launching was made by a Sabre in flight.

The transport aircraft spares business continues to be a gratifying

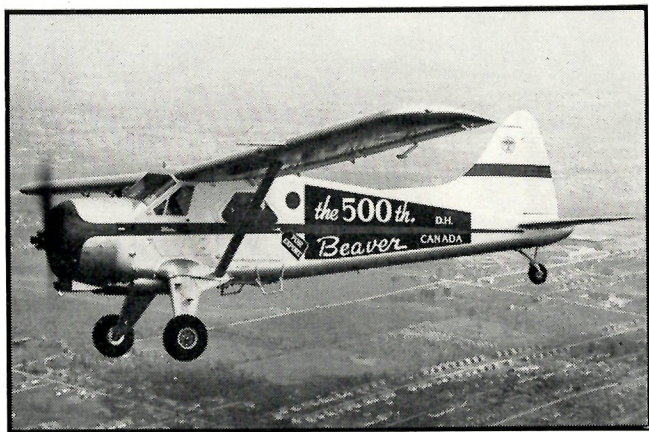
source of income for the company. New spares are in quantity production for C-47/DC-3 and North Star type aircraft. In this respect, a major replacement part was supplied last year to BOAC in the form of a complete Argonaut (North Star) wing centre section. The section was shipped to Hong Kong where it was fitted to a BOAC Argonaut which had been heavily damaged in an accident. Biggest buyer of C-47 parts is the USAF, while other customers include the RCAF and over 100 civil air lines scattered through 45 different countries.

The CL-21 "DC-3 Replacement" project has been put aside for the time being, Canadair's sales survey having shown that the market was still not great enough to make pro-

duction a profitable business. Now that this company is being licensed to build the Britannia, it follows that it will try to sell airliner versions to civil customers, though it is not clear as to just how much scope the licensing agreement will allow in this respect.

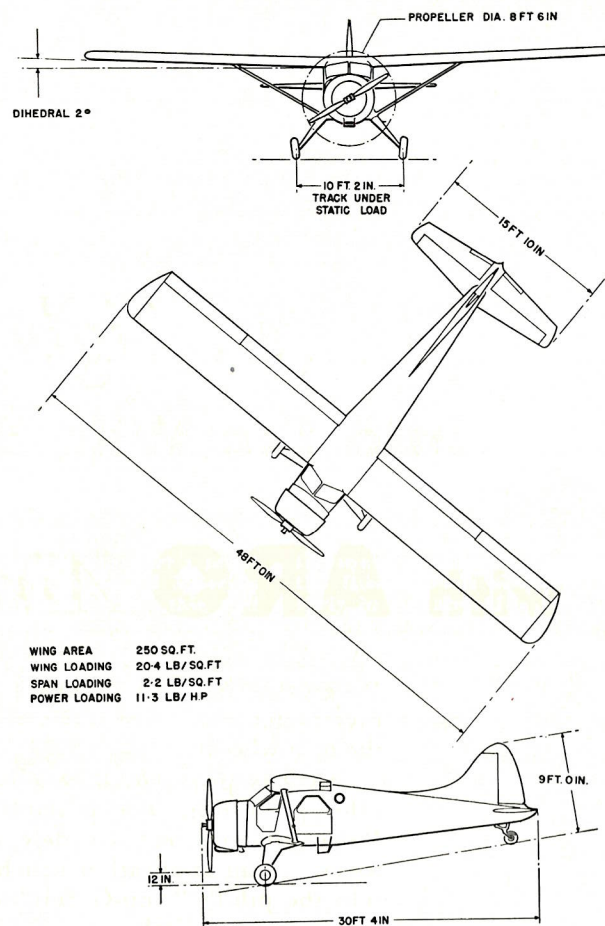
The proposed CL-42, a civilized version of the T-36A for executive use, was recently abandoned as impractical. Required design and structural modifications were so extensive that the cost could not possibly have been recovered on the anticipated sales volume.

Sabre Successor: The possibility of Canadair receiving a contract to build a successor to the Sabre as the RCAF's standard day fighter cannot be



Now in its seventh year of production, the Beaver's popularity shows scant sign of dimming. This is perhaps due in large part to the fact that the requirement the Beaver was designed to meet has existed for many years unchanged, and appears likely to continue unchanged for some time. The Beaver can count on being the subject of demand until such time that somebody designs a new airplane to a similar specification, which will be able to fill the role of a utility airplane with a marked degree of superiority to the Beaver. The

Beaver is now approved for a maximum gross take-off weight of 5,100 lbs., a commendable increase over the 4,500 lbs. at which the Beaver landplane was originally certificated. The model in production is, of course, the Mk. 1, powered by the Pratt & Whitney R-985 Wasp Jr. of 450 bhp for take-off. During 1953, a Mk. 2 version powered by the British Alvis Leonides engine was developed successfully. The prototype is being demonstrated by the parent company in England for sale in the dollar-short countries of the world.



DE HAVILLAND DHC-2 BEAVER

ignored. Such a replacement surely must be made if the effectiveness of No. 1 Air Division in Europe is to be maintained at its present high level. The choice of a replacement type must be made within 18 months, if new aircraft are to be available in squadron strength before the Sabre's curve of obsolescence begins to fall off too sharply. Two aircraft which have been mentioned are RCAF Sabre successors are the Convair F-102 delta and the North American F-100 Super Sabre, both of which are powered by the 10,000 lb. th. P & W J-57. Whatever the final choice is, it almost goes without saying that Canadair will be the builder.

Another activity of the firm is the conducting of training classes in which RCAF technical personnel are indoctrinated with the intricacies of the F-86 and of the T-33. Several hundred servicemen, as well as numerous Canadair technicians, have now passed through the courses, which are held in classrooms located in the company's big new flight test hangar.

More Space: This hangar, incidentally, was completed during the past year and its 170,000 sq. ft. brings the total space occupied by Canadair at Cartierville Airport to nearly 2,000,000 sq. ft.

In the repair and overhaul field a considerable amount of work for which Canadair is the prime contractor has been sub-contracted to other large firms in Canada and the U.K. For example, Northwest Industries of Edmonton holds a sub-contract for repair and overhaul of all RCAF T-33's in Western Canada; The de Havilland Aircraft has been given the job of providing similar services for North Stars, while in the U.K., Bristol Aeroplane Company and Airwork hold sub-contracts covering repair and overhaul services for both airframes and engines of RCAF F-86's in service overseas.

de Havilland

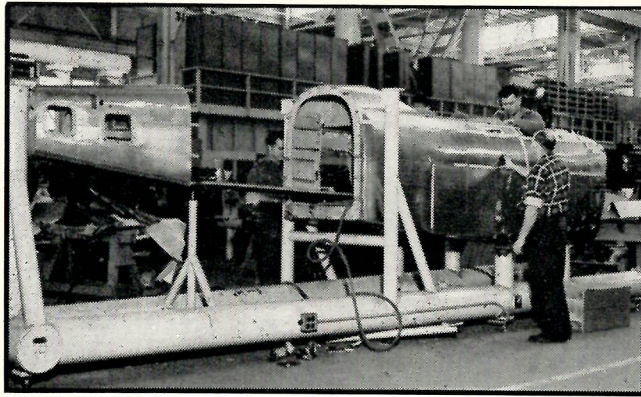
THOUGH Beaver production fell off somewhat last year, the outlook remains bright for The de Havilland Aircraft, which completed

moving into its spanking new factory at Downsview Airport during February.

While the new plant is no larger than the old one, and in fact with 600,000 sq. ft. probably has slightly less floor space, its more modern and efficient design is expected to be more productive than the old facilities, which had "just grown" over the years as various additions were built. Cost of the new plant was over \$7,000,000.

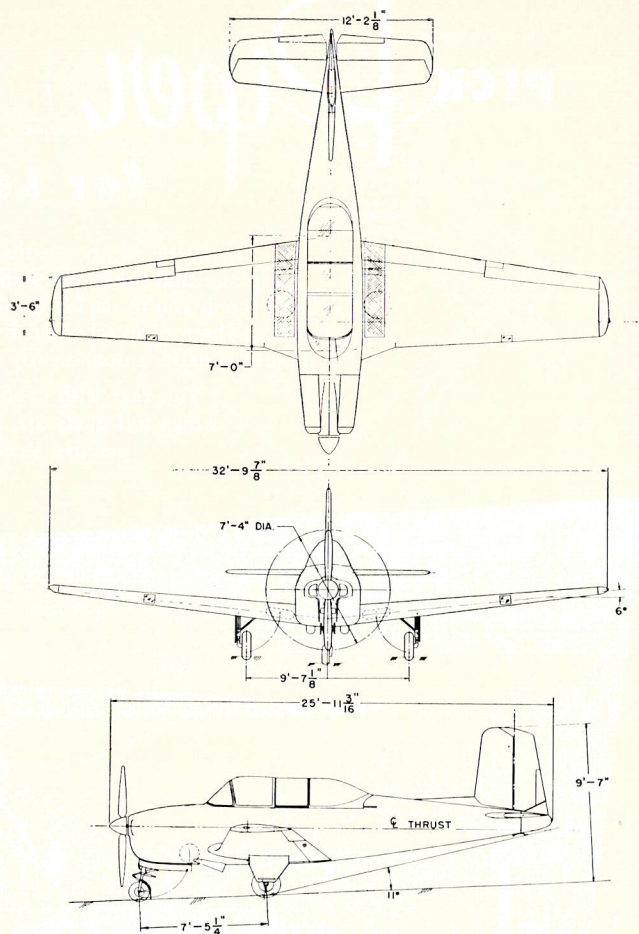
Projects at de Havilland continue to be many and varied. In the new construction line, the Beaver is still the mainstay. Approximately 600 have been built since production started in 1947 and output is still about 15 a month for the USAF, the U.S. Army and civil operators all over the world. There is a recent, and unverified report, that negotiations are under way with the U.S. Services for 200 additional L-20 Beavers.

Spares Service: With this great number of Beavers now in service, the spares business is assuming fairly substantial proportions. Besides the



Intended to be a successor to the Harvard/Texan series of advanced trainers, the Beech T-34A is now in production at the Fort William plant of Canadian Car & Foundry (above). An all-metal, low-wing cantilever monoplane with fully retractable tri-cycle landing gear, the "Mentor" is powered by a Continental O-470 flat six engine developing 225 hp for take-off. The aircraft has a maximum speed of 189 mph, a service ceiling of 20,000 feet and a maximum range of 975 miles. Empty weight is 2,170 lbs. and gross take-off weight, 2,900 lbs. Total wing area, including ailerons is 177.6 square feet.

Cruising speed at 60% power is claimed to be 173 mph, while placard speed is 280 mph. The initial rate of climb is 1,200 fpm. Take-off distance required to clear a 50-foot obstacle is 1,030 feet and the landing distance over a 50-foot obstacle is 835 feet. With full flaps, the landing speed is approximately 55 mph. The airplane is a design of Beech Aircraft Corp., which also has it in production for the USAF. Beech estimates that each T-34 will save 150,000 gallons of aviation fuel over a five year period as compared to a Harvard, with both aircraft being utilized five hours a day.



CANADIAN CAR T-34A MENTOR

Beaver spares, there is also a considerable demand for replacement parts for the more than 150 Canadian-built Chipmunks in service around the world.

Orders in hand for the DHC-3 Otter are still not yet completed. About 20 have so far been delivered, most of these being to the RCAF. The airplane has been demonstrated to U.S. authorities, who have shown great interest, but to date no orders have been forthcoming.

A major undertaking on which work will start soon will be the production of the Grumman S2F anti-submarine aircraft for use by the RCN and possibly for Mutual Aid countries. While a contract had not actually been awarded at last reports, the fact that the S2F program would be handled by de Havilland has already been announced officially by Defence Minister Brooke Claxton. It is understood that the initial order will be for 100 aircraft worth approximately \$40,000,000, and that this may be followed by an additional order for 150 units. Much of the work will

probably be sub-contracted and it should be pointed out that a large part of the airplane's cost is made up of electronic gear, with which the S2F is elaborately equipped.

Development: On the development side, last year saw the Beaver 2 take to the air. Powered by the 550 h.p. Alvis Leonides engine, which develops about 100 h.p. more than the Wasp Jr., the Beaver 2 prototype is now in the U.K., where it is being demonstrated by the parent company with the idea of sales in the sterling area. If orders can be obtained, it will probably be produced under license in the U.K. by the parent firm.

The repair and overhaul and modification program covers a wide range of aircraft and includes two types of jet engines, as well as reciprocating engines. Vampires are continually passing through the shops, and their Goblin turbojets are overhauled at de Havilland's jet engine overhaul base, which is adjacent to its old plant. In this plant also will be overhauled the Ghost engines used in the RCAF's de Havilland Comet 1A's.

Immediately alongside the Goblin engine overhaul building is the axial flow turbojet overhaul establishment, the operation of which de Havilland took over from Canadian General Electric at the beginning of this year. This plant is actively engaged in the overhaul of those General Electric J-47 turbojets used in RCAF F-86E Sabres in service in Canada. As these Sabres are replaced by the newer Sabre 5, so the J-47 engines passing through the plant will be replaced by Orendas.

Out of Service: It was because the General Electric engine would gradually be disappearing from service that Canadian General Electric asked to be relieved of the responsibility of managing the overhaul base, and subsequently it was taken over by de Havilland at the request of the Department of Defence Production. The plant, however, is still government property.

The 72,000 sq. ft. J-47 overhaul centre was opened about mid-1952 and the first overhaul was completed just 18 months after plant construction

started in March, 1951. Employment is about 150.

On the airframe side, de Havilland is also responsible for provision of service for the RCAF's Comets, the first of which has recently been in the company's shops.

Features of last year's activities included the completion of a conversion program on 48 RCAF Lancasters, and the repair and overhaul of 11 ex-RCAF Norseman aircraft which were later shipped to the Royal Norwegian Air Force as a Mutual Aid contribution from Canada.

main assembled from component parts manufactured during the wartime program). Most of these have been for the RCAF and the USAF.

Harvard Spares: Though the assembly of complete aircraft is finished, manufacture of spare parts will continue for some time at Fort William. Spares are being supplied to the RCAF, the USAF, and also to Mutual Aid for shipment overseas.

An interesting fact about the final Harvards being produced by CanCar is that they are almost 100% Canadian in content. The airframe is

contract of T-36 outer wing panels and engine nacelles. With the cancelling of the contract, employment was reduced to its present level of about 1,500 from a peak of over 1,800.

Orders to Come: However, CanCar reports that negotiations are proceeding in an orderly fashion on further aircraft contracts. In this connection, it is expected that this firm's Aircraft Division will share substantially in the Grumman S2F contracts, probably fabricating major components for the prime contractor, The de Havilland Aircraft.



Employment at The de Havilland Aircraft of Canada now exceeds 2,200.

Canadian Car & Foundry

EVEN THOUGH the Harvard production program at Canadian Car & Foundry's Fort William plant is almost complete, assembly line continuity will be maintained by virtue of the Beech T-34A manufacturing project which is being carried out for the USAF. The last Harvard will be completed this month and the first CanCar-built T-34A should take to the air a short time later.

The version of the apparently timeless Harvard that is now nearing the end of its second Canadian production run is the Texan T-6J in USAF terminology, and is almost identical to the airplane that is listed on the RCAF's books as the Harvard 4M. Practically the only points of difference are to be found in cockpit layouts, which are those standard for the USAF and the RCAF respectively.

During the present production run, somewhere between 500 and 600 aircraft have been built since the first machine was completed late in 1951 (the first 40 or so units were in the

Preparatory work is now under way to produce the Grumman S2F anti-submarine aircraft in Canada. Prime contractor is to be de Havilland, but it is expected that the job will be extensively sub-contracted.

manufactured in its entirety by CanCar's Fort William plant, using Canadian raw materials. The P & W R-1340 Wasp with which the aircraft is powered, is manufactured at Jacques Cartier, P.Q., by Canadian Pratt & Whitney Aircraft (the engine has a substantial U.S. content in the sense that a number of the major forgings in rough form are supplied by U.S. sources).

CanCar's Machine Division at Point St. Charles in Montreal produces the hydromatic propellers, governors, undercarriages, and hydraulic equipment which go on the Harvard. Many of the instruments are being manufactured in Canada, so apart from a limited number of accessories, the airplane is truly Canadian-made.

CanCar's Aircraft Division was another of the several organizations that were hard hit by the cancellation of the T-36 contract last year. At the time, tooling was well advanced towards the production under sub-

The T-34A, CanCar's present chief project, is understood to be the subject of an order for 150-200. It is also being produced in even larger quantities by Beech Aircraft Corporation, which developed the airplane as a private venture, basing the original on the popular Beech 35 Bonanza civil four-place personal airplane.

First known as the Beech 45 "Mentor," the T-34A quickly caught the eye of the USAF and has won every evaluation contest in which it has been placed since its first flight in December, 1948. It has also been ordered by the Chilean Air Force (from Beech).

CanCar's aircraft manufacturing facility embraces 702,320 sq. ft. of floor space and there are at present no plans for plant expansion. The existing buildings are permanent structures, for the most part constructed of brick and brick tile. The principal buildings comprising the plant include: (1) a large main assembly building consisting of three bays, with a total floor area of 216,000 sq. ft.; (2) a detail fabrication building of 55,100 sq. ft.; (3) a machine shop of 17,600 sq. ft.; (4) a pre-

(Continued on page 90)

Helicopter Bible

The IATA has announced the publication in book form of the record of its Symposium on Helicopter Operation & Design Requirements.

The book is the product of a unique meeting held during the Sixth IATA Technical Conference at San Juan, Puerto Rico, in which designers and manufacturers of helicopters participated in a complete, objective exchange of information with present and potential users of the rotary wing aircraft, with armed forces, government agencies, research laboratories,

and others.

J. T. Dymont, Director of Engineering for TCA, acted as chairman of the Symposium.

Copies of the IATA helicopter book are available for \$6.00 (U.S.) each on order to the IATA Technical Secretariat, International Aviation Building, Montreal 3.

CANADIAN CAR

(Continued from page 37)

fabricating building of 112,000 sq. ft. The main assembly building,

machine shop and detail fabricating building are all equipped with overhead crane service. Other buildings, some attached to, and others detached from the main buildings, make up a total of 662,000 sq. ft., including office buildings. In addition to these facilities, CanCar owns two hangars at the Fort William Airport, approximately one-and-a-half miles from the main plant, one of 7,000 sq. ft., and the other, a double hangar, of 40,320 sq. ft.

The plant is well equipped with modern metalworking 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, in addition to 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. In brief, CanCar operates a well-rounded aircraft facility, capable of carrying out all phases of an airframe production program.

INDUSTRY AT WORK

(Continued from page 63)

dian and U.S. companies active in the aircraft field. Plant area is approximately 70,000 sq. ft.

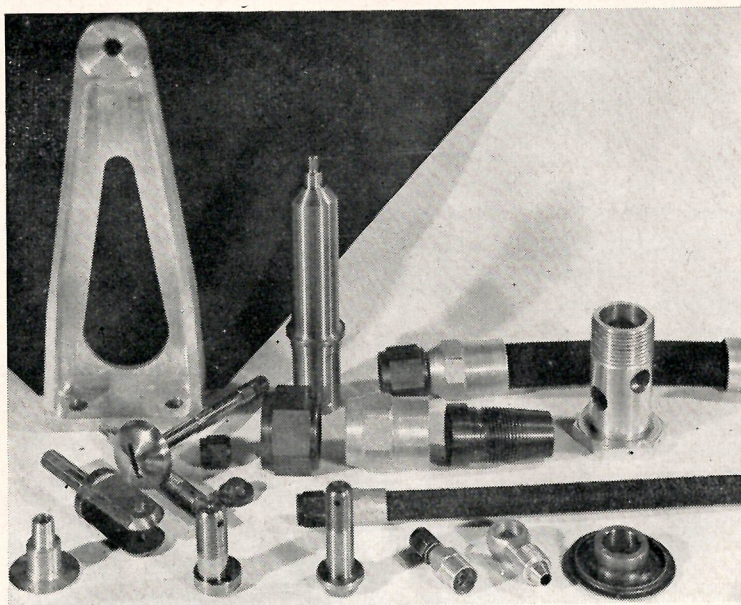
•Godfrey Engineering Co. Limited:

Godfrey's plant near Montreal has been expanded to accommodate the steadily increasing aviation business handled. The Company manufactures a wide range of aircraft cabin superchargers and cold air units, and, in addition to this airborne equipment, produces ground servicing equipment especially designed for the climatic conditions of North America. Godfrey reports a wide acceptance of its original design pressure cabin testing trolleys, oxygen servicing trailers, hydraulic filling and bleeding units, hydraulic hose testers, and ground air conditioning units. At the Montreal plant the Company offers a comprehensive service of engineering research and design to final manufacture.

•Thompson Products Limited:

Located at St. Catharines, Ont., Thompson Products operates a 150,000

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