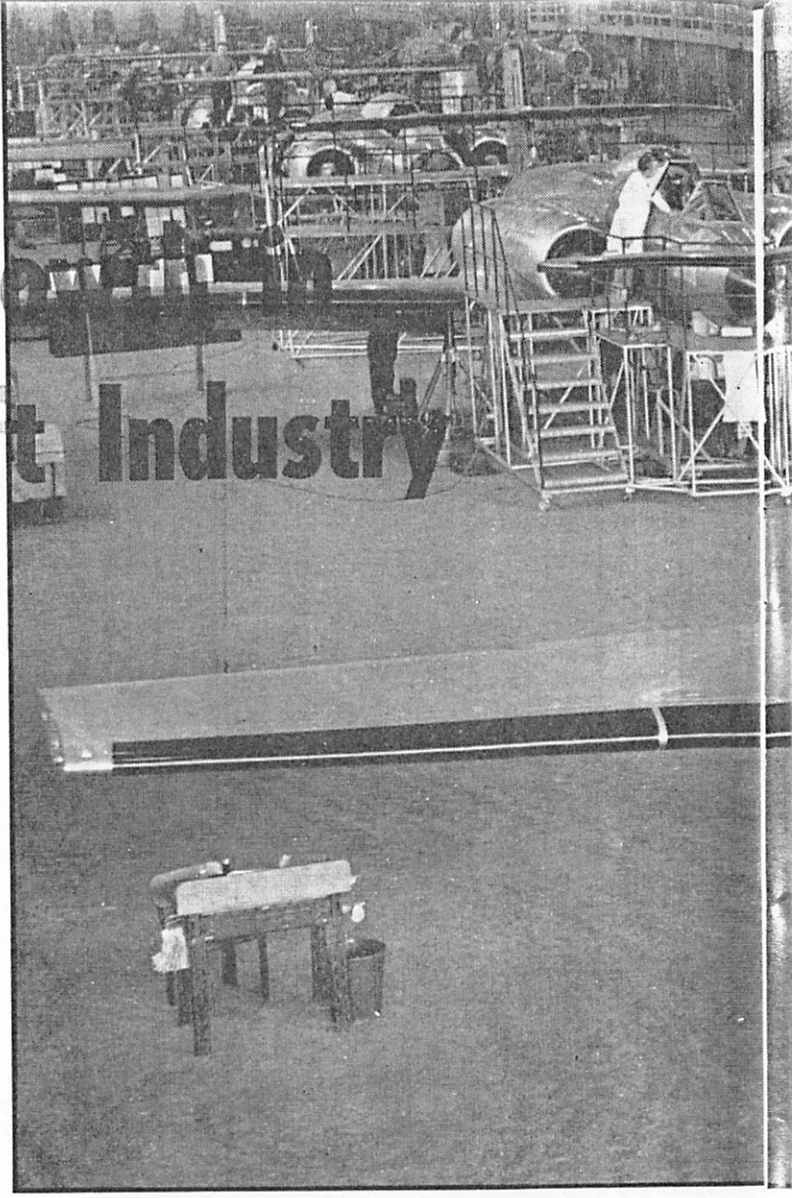
# A Year of Gr... in Canada's Aircraft Industry



IT HAS been a big year for Canada's Aircraft Industry and there is an even bigger year ahead. Since March of last year there has been an encouraging amount of growth and development. New plants have opened, established plants have expanded, new companies have joined the growing ranks of suppliers to the Industry. Producers have recovered from the initial flush of victory at turning out their first production units and have settled down to filling orders with increasing tempo. Last year's empty pipelines have filled and the flow of materiel to the prime producers is swelling rapidly. The big hurdles have been passed.

The news headlines have been telling a story of Canadair, Avro Canada and the others, but deserving of praise as these companies might be, the news stories might also sing a song of Chatco and Thor Canadian and Curtiss-Reid and Cub Aircraft. For the rapid expansion and growing production record of Canada's Aircraft Industry can be attributed in large measure to the hundreds of subcontractors—the old hands at the business like MacDonald Bros. and Dowty Equipment of Canada, or the newcomers like Hussman Refrigerator Company and Enamel & Heating Products, whose normal business obviously has nothing to do with airplanes. Nevertheless, such companies are playing a vital role in Canada's Aircraft Industry.

It is significant that of the 47,000 Canadians now directly employed in the building of aircraft, engines, and ancillary equipment, just 70% work for the producers of the finished airframes and their powerplants, the big six: Canadair Limited of Montreal, A. V. Roe Canada Limited of Toronto, The de Havilland Aircraft of Canada Limited of Toronto, Canadian Car & Foundry Co. Limited of Fort William, Canadian Pratt & Whitney Aircraft Co. Limited of Montreal, and Rolls-Royce of Canada Limited, Montreal. The big six might more aptly be called the big seven, since A. V. Roe Canada, with its increasingly autonomous Aircraft and Engine Divisions, is effectively two separate companies.

If it were possible to calculate the untold thousands who work for companies who are directly and indirectly associated with Canada's Aircraft Industry as suppliers of raw materials and standard items like nuts and bolts and rivets, it is probable that it would be found that upwards of 65,000 persons are contributing most of their time and talents to the air defence production program. Thus, it is easy to see that the success or failure of the program depends only partly on the prime producers. They in turn must depend on firms like the Aluminum Company of Canada, Atlas Steels, Dominion Fasteners, and Drummond, McCall, Cresswell Pomeroy and Crystal Glass & Plastics.

The list is practically endless. Both Avro Canada and Canadair claim something like 400 supplying firms. There is undoubtedly a large degree of overlap, but the total is still impressive. Not only are the numbers of firms and people they employ large, but also the sums of money that goes to them.

Most people find the dollar value of the contracts awarded to the prime producers somewhat beyond their comprehension. What is too rarely realized, however, is the great percentage of this money that goes out to the subcontractors. For some time last year Canadair was placing orders with other firms to the tune of $12,000,000 per month. Avro Canada can tell a similar story. Much is being spent, but many are benefiting.

It was originally estimated that equipment for air defence would take approximately $1.2 billion of the $5 billion that Canada was going

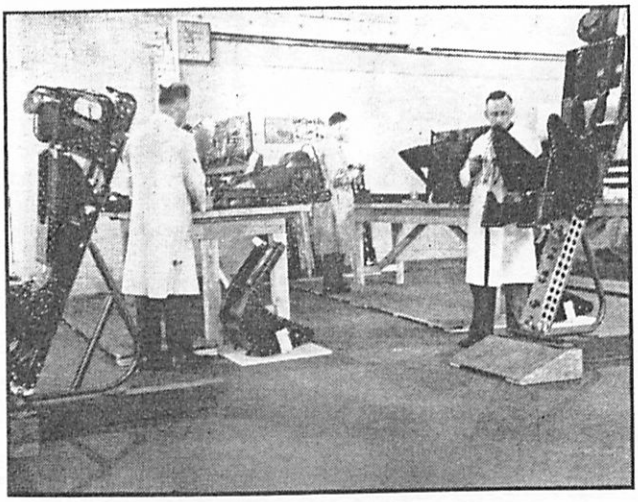
to spend on rearmament. Since the original plans were made, higher costs have undoubtedly raised this figure. Thus, the amount of money that will eventually be spent in rebuilding Canada's air defences will probably reach $1.3 billion. Of this, some 80% or more will go to Canadian industry; most of the rest will go to the U.S., the remainder to a few British firms.

But Canada's Aircraft Industry is also supplying equipment under Mutual Aid agreements, and to the USAF. These additional contracts will more than make up for the funds being spent in the U.S. and the U.K. Mutual Aid alone has been allotted more than $108,000,000 in the 1953-54 Estimates. This amount will be used in the main to cover the cost of the F-86E airframes being supplied to the RAF under a joint Canada-U.S.-U.K. deal (Canada supplies the airframes, the U.S. the engines, the U.K. the aircrews) to build up NATO air strength.

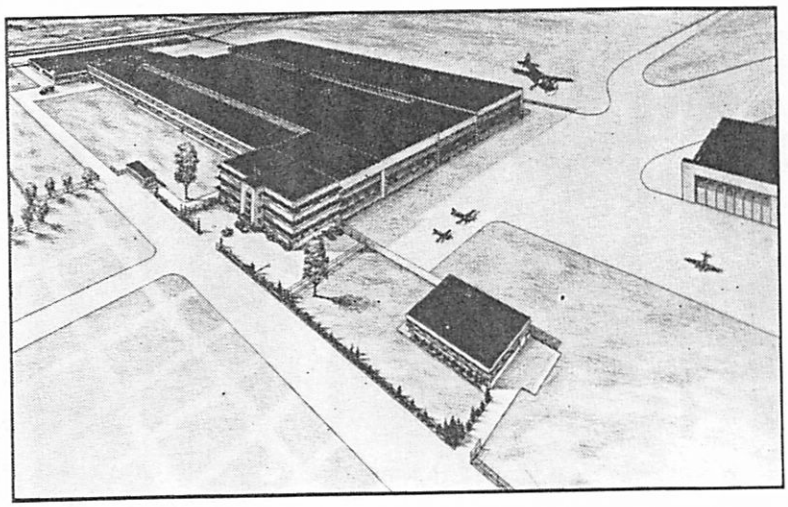
While orders from the USAF are of great importance, the heavy spender is still nonetheless the Canadian government. Here is the way the largest part of air defence funds will be spent during 1953-54, according to the Estimates:

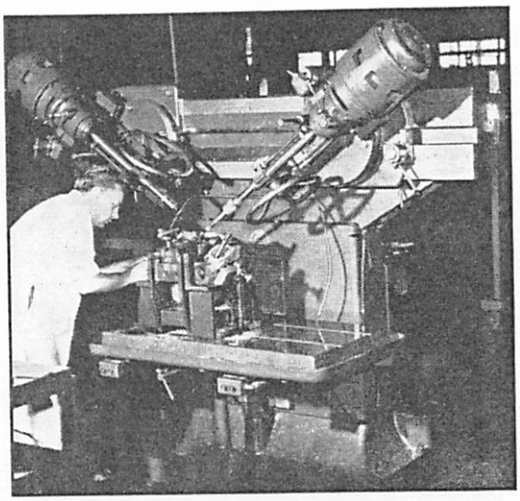
For the RCAF, $420,232,600 has been set aside for procurement of *(Please turn page)*

BLADE FORGING BY CANADIAN STEEL IMPROVEMENT.



LEFT, RAF SABRE DELIVERIES ARE WELL UNDER WAY; RIGHT, MARTIN-BAKER EJECTION SEATS BY CANADIAN FLIGHT EQUIPMENT.





LEFT IS THE DE HAVILLAND AIRCRAFT'S NEW PLANT, NOW BUILDING; RIGHT, CYLINDER PRODUCTION AT CANADIAN P & W.

aircraft and engines (this includes most of the $108,195,000 Mutual Aid sum already mentioned. This represents an increase of nearly $200,000,000 over last year. On repair and upkeep of equipment will go $83,042,900, down about $16,000,000.

Armament equipment (excluding ammunition & bombs) will take $4,515,000. For signal and wireless equipment the RCAF will spend $50,092,000, not quite double the previous year's figure. Special training equipment—flight simulators, ground training aids of all kinds, etc.—will take $7,823,000, up about a million and a half, while miscellaneous technical equipment of all types will claim an additional $12,838,000, an increase of nearly $3,000,000. Apart from spending for the RCAF, $1,538,000 will be paid out for Naval aircraft and engines, some $300,000 less than last year.

The most striking difference about the situation today as compared with the same time last year is that the building job is now 99% complete. Plants have been constructed and equipped. Production teams have been organized and are functioning smoothly. The program is proceeding largely on or ahead of schedule. This applies, too, to oft-criticized Avro Canada, whose Engine Division is ahead of schedule and whose Aircraft Division is rapidly regaining the time lost as the result of the many delays that have plagued it during the last two years.

By and large, there are now no serious obstacles to full-scale production in Canada. Sources to meet almost every conceivable requirement have been found in Canada and are meeting the needs of Canada's Aircraft Industry. The most sophisticated light metal castings and forgings are being supplied by the Aluminum Company of Canada and Light Alloys Limited; gears come from Canadian Acme Screw & Gear; instruments from Sperry Gyroscope Company of Canada, Phoenix Engineered Products, and soon from Aviation Electric; plastic canopies from Crystal Glass & Plastics and Mutual Industries; ejection seats from Canadian Flight Equipment and others . . . and so on, ad infinitum.

### aircraft development

THE ONLY uncertain aspect of the future of Canada's Aircraft Industry is in the field of research and development. Now that all the major snags have been worked out of the Mark 4 CF-100, including its armament, and the Orenda Sabre is ready for production, the Government has had time to tote up the total cost of the development program that has now reached fruition. They have found that it adds up to a lot of money ($73,000,000 for the engine and $71,000,000 for the airframe) and

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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); Aviquipo 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 suppiles); International Nickel Co. of Canada Limited, Toronto (nickel alloys of all types); Railway & Power Engineering Corporation Limited, Montreal (aviation supplies).

### INDUSTRY REPORT

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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-

ing is leaning in this direction. At the same time, the RCAF hierarchy takes the opposite stand. They point out that the CF-100 meets a requirement that is peculiarly Canadian: there is simply no other airplane design available from any friendly country that can supply the seemingly contradictory specifications calling for extremely long range, high subsonic speed, performance at extreme altitudes, ability to operate from comparatively short runways, and the firepower of a light cruiser (believe it or not, the simultaneous firing of both rockets and guns from a CF-100 Mk. 4 would be roughly equivalent to a broadside from a light cruiser).

The alternative to using an aircraft like the CF-100 would be to make do with something like the F-86D, the F-94C or the F-89, any one of which would be required in greater numbers and would necessitate more bases to provide the same coverage as the versatile, far ranging CF-100. Thus, in the long run, building to other nations' designs could cost as much or more than developing designs in Canada.

Of course, what has influenced thinking away from Canadian development has been the creditable production record of Canadair Limited with the F-86E. There is a feeling that if Canada had adopted a British or American all-weather fighter, then the RCAF would now have equipment of this type in the hundreds, just as it has Sabres in the hundreds. While this may be true, the fact is still inescapable that these hundreds of airplanes would not be capable of doing the job properly.

One of the most important considerations, and one that the layman rarely gives any thought to or even properly understands, is the strategic implications of the engineering control over an aircraft design being centred in another country. In peacetime this is, at the best, extremely irritating. In the case of the F-86 for instance, North American must pass on all modifications, however small. The same applies with the T-33, any changes to which must be approved by Lockheed. It sounds simple enough but it frequently runs into so much red tape that changes are not usually made to aircraft built under license unless they represent major improvements. This is typical of practically all licensing agreements.

In wartime this could obviously cause serious delays. Interchange of engineering data between the designer and the licensee would be retarded by wartime security. Most important, this interchange would depend too much on especially vulnerable communications. This applies particularly to British designs, and to a slightly lesser degree to American ones.

In any event, this problem is evidently one on which Government thinking has not yet crystallized. Whichever way the decision goes, it will have little effect on Canada's Aircraft Industry as a producer of aircraft and allied equipment. There is no doubt on that score. The Government was well-advised to foster a self-sufficient aircraft industry. In fact, it was so successful in this regard that Canada is rapidly becoming a leading exporter of military aircraft.