

Testing the "Chinook" — the first Canadian-designed turbojet aero engine.

Orenda Engines Limited, Malton —

designers, developers and producers of the Orenda and Iroquois turbojets, who are now broadening their scope

While Orenda Engines Limited was incorporated as a separate company, within the A. V. Roe Canada group, on January 1, 1955, its story goes back to 1943 when the Canadian government sent a group to England to study turbojet engine development. As a result, the government created a company known as Turbo Research Limited, consisting of about fifty scientists and engineers, to investigate the possibility of turbojet engine design and manufacture in Canada.

In 1946 A. V. Roe Canada Limited took over the operations of Turbo Research, set up a Gas Turbine Division, and designed an engine — the *Chinook* — of some 2,600 pounds of thrust. A number of *Chinooks* were manufactured to establish shop facilities, develop engineering skills, and create sub-contract sources.

The first Orenda flies

In the meantime, the first all-Canadian fighter, the CF-100, was on the drawing boards of what is now Avro Aircraft Limited. The RCAF ordered the design of a jet power plant for this aircraft, to have a thrust greater than that of the most powerful engines then known to be on the drawing boards in Great Britain and the United States. The Gas Turbine Division designed and built this engine, and an experimental model powered a North American *Sabre* F-86A in 1950.

A total of 3,794 Orenda engines were produced in six different models at a cost per pound of thrust said to be more favorable than that prevailing elsewhere. They provided the power to make the Avro CF-100 and

the Canadair *Sabre* supreme in their classes until they were superseded by later designs in other countries. Production of Orenda engines came to a close towards the end of 1958. At this time they were flying in Canada, France, Germany, Belgium, South Africa and Colombia.

Development during production

Throughout the production period there was a steady increase in engine efficiency. The first production engine had a thrust of 5,800 pounds and weighed about 2,700 pounds. Later models had thrusts well over 7,000 pounds and weighed about 2,400 pounds, in spite of the addition of another turbine stage.

The world's most powerful aero engine?

Orenda's new engine, the *Iroquois*, is in an entirely different class. Believed to be the world's most powerful gas turbine ready for production, it may be flying in Avro's CF-105 before these words see print. It seems beyond question that the CF-105 airframe with *Iroquois* engines will be world's fastest, highest performance, aircraft.

Modern versatile facilities

Orenda's facilities include a fully air conditioned production plant with 800,000 square feet of floor space, designed for rapid expansion. It is equipped with modern, multi-purpose machine tools; a heat treatment plant with automatic equipment; a blade shop with batteries of automatic and semi-automatic machines;

sheet metal and pipe shops. It houses offices, an engine overhaul department, the Sales and Service organization, with spare parts stores and training school.

There is, also at Malton, an experimental manufacturing plant situated on the ground floor of a separate building, with the engineering offices above. It is equipped with every facility necessary for manufacturing and assembling experimental engines.

A modern building, adjacent to the experimental manufacturing plant, houses mechanical, vibration, instrument, fuel systems, and aerodynamics laboratories.

In addition to batteries of production test cells, there are six new development test cells, with the most modern equipment, and capable of handling engines with air flows fifty per cent greater than the largest known today.

A new altitude test facility makes it possible to simulate a wide range of altitudes and Mach numbers for engine development testing. It is capable of handling the largest engines and has been specifically designed for extension of the operating envelope to meet requirements.

A separate test establishment is located at Nobel, Ontario, near Georgian Bay. The site was chosen because large quantities of power and water were readily available, and it was sufficiently remote for the release of high energy sound.

Concerned with power

It is generally understood that Orenda engineers are working on a number of new projects related to the development of power, but details of these projects have not been published.

Canadair Limited, Montreal -

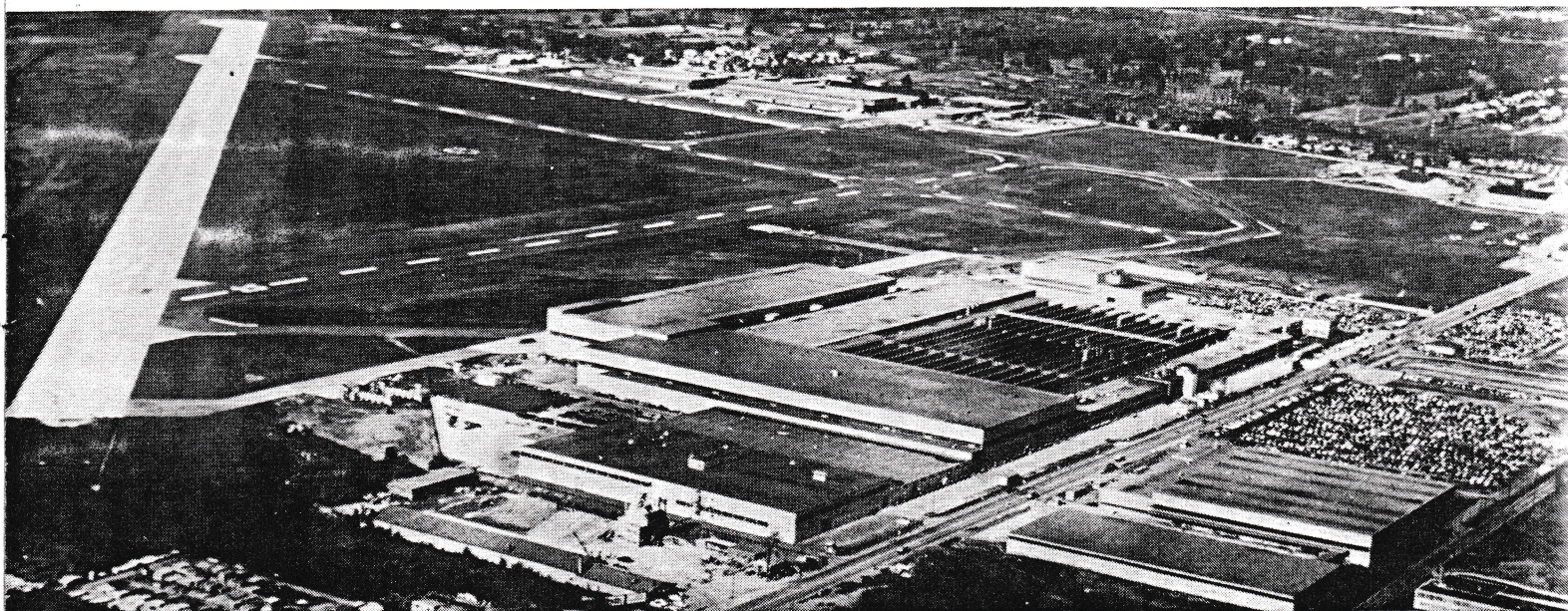
has produced more than 3,000 aircraft including Silver Star jet trainers and Sabre fighters, and is now developing and producing Canada's largest aircraft, the CL-28 Argus and the CL-44

Canadair Limited, Montreal, traces its origin to the Aircraft Division of Canadian Vickers Limited, which was formed in 1923. It was reorganized in 1942 under Canadian government sponsorship and housed in new plants bordering Cartierville Airport, eight miles from the center of Montreal, in suburban St. Laurent. In 1947 it was purchased by what is now General Dynamics Corporation, and is a subsidiary of that organization.

The three principal plants now have a total roofed area of about 65 acres, apart from the airfield and outdoor work areas. As at December 1, 1958, there

were about 10,000 employees, including more than 1,000 engineers and engineering technicians.

The company possesses complete facilities for research and development, design, engineering, tooling, and the mass production and assembly of aircraft. It is engaged also in the development and production of nuclear installations, articulated tracked amphibious vehicles, and other highly specialized undertakings. For other aircraft manufacturers it builds aircraft components and tooling.



Three Canadair plants bordering on Cartierville Airport, near Montreal. No. 1 is in center foreground — No. 2 in center background, and No. 4 in the right background.