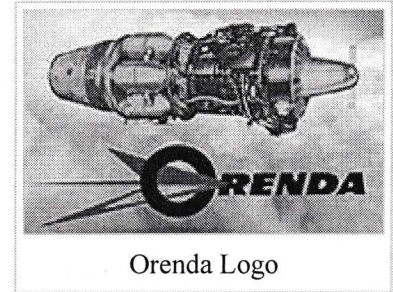


Orenda Aerospace

From Wikipedia, the free encyclopedia
(Redirected from Orenda)

Orenda Aerospace is a Canadian aircraft engine manufacturer and parts supplier and part of the Magellan Aerospace Corporation. As part of the earlier A.V. Roe Canada organization and later, Orenda Engines, they produced a number of military jet engines from the 1950s through the 1970s, and were Canada's primary engine supplier and repair company.



Orenda Logo

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The Banks Report

The origins of the company stem back to the Second World War. During the war, the National Research Council of Canada ran a small aerodynamics effort similar to NACA in the US or Royal Aircraft Establishment in the UK. In 1942 they sent two of their researchers to the UK to take a survey of their efforts and report back on what fields of study the Canadians should focus on in order to avoid duplication.

One of the many topics mentioned was Frank Whittle's efforts to build the first working jet engine. At the same time the fledgling RCAF was concerned about their dependence on the US and UK for their aircraft engines. Both the RCAF and NRC felt the jet engine offered a way for Canada to quickly catch up in this newly evolving field. Another report was started to make an exhaustive study of the jet engine efforts in the UK, and to try to find roles where Canada could aid the UK efforts as soon as possible.

Over the next year a number of members of the NRC's aerodynamics lab traveled to the UK, and in May 1943 they published their findings in the top secret *Report on Development of Jet Propulsion in the United Kingdom*, but widely known as the Banks Report. Among their recommendations was the suggestion to form a cold weather testing center, as jet engines had not been tested in that environment at that point in time. Another suggestion was to form their own engine company as soon as possible.

Turbo Research

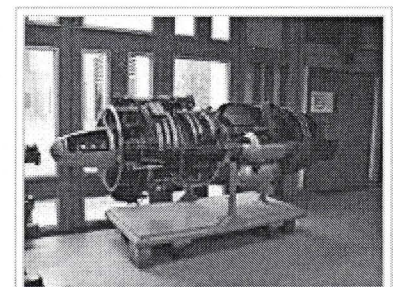
Following the advice of the Report, in March 1944 the government formed **Turbo Research** as a crown corporation in Leaside, now a part of downtown Toronto. Several members of the NRC teams that had traveled to the UK during the Report moved to the new company, including K.F. Tupper as chief engineer, and Winnett Boyd, initially as the combustion engineer, but later as the chief designer.

Boyd quickly outlined two "paper designs", the **TR.1** based on Whittle's centrifugal-flow design, and the **TR.2** using an axial-flow design. It appears everyone thought it was best to move directly to the more promising axial-flow design, and started work on the **TR.3**, a larger version of the TR.2. As work progressed, Boyd moved onto his own project, a smaller axial-flow design called the **TR.4**, and later known as the *Chinook*. Work on the TR.3 was later abandoned.

A.V. Roe Canada

At about this time, the former Victory Aircraft plants in Malton were being converted into the new A.V. Roe Canada (Avro) plants. In the spring of 1946 the government decided to turn all engine development over to private industry, and sold Turbo Research to Avro. Paul Dillworth remained as chief engineer of the newly christened **Gas Turbine Division**, which was moved to Avro's plants just outside what is today Toronto Pearson International Airport.

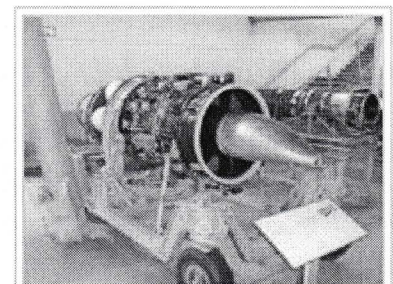
Work on the TR.4 continued through this period, but in the summer, Avro asked them to produce a new 6,500 lbf (28.9 kN) engine for their CF-100 *Canuck* interceptor design. The resulting **TR.5 Orenda** design was essentially a scaled-up Chinook, with work continuing on the later to bring the production and test teams up to speed. The Chinook, the first Canadian-designed jet engine, first ran on March 1948, producing 2,600 lbf thrust.



Orenda engine on display at Carleton University

Orenda Turbojet

The Orenda design was similar enough to the Chinook that prototype production was completed in less than a year, and the engine first ran in February 1949. Testing proceeded quickly at a facility outside Nobel, Ontario, formerly a munitions factory. Between the first run in February and the start of production in the late fall, the prototypes ran over 1,000 hours, a record for the era. When it entered production it was the most powerful engine in the world, a title it held until 1952. Almost 4,000 Orenda engines of various versions were built before the final unit was delivered to the RCAF in July 1958.



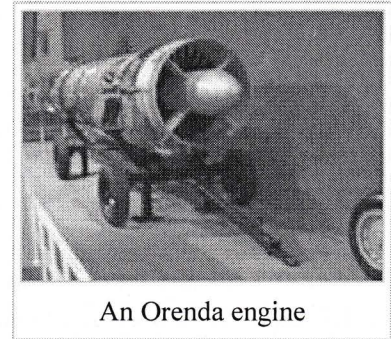
Orenda 14 Turbojet

The Orenda entered production for the CF-100, which were used in Canada and the Belgian Air Force. Later versions of the Canadair manufactured F-86 Sabre also used the Orenda in place of their General Electric J47's, providing a dramatic boost in performance, holding the crown for F-86 performance for some time. The Canadair Sabre became a popular export item as well, with versions being sold to the West German, South African, Colombian and Pakistani Air Forces. For some time the USAF considered producing their own Orenda-powered version, the F-86J, although

these plans were later dropped when they turned their attention to more powerful supersonic designs. Boeing used a Canadair Sabre well into the 1970s as a chase plane, notably during the development of the Boeing 747.

Orenda Iroquois

In 1953, Avro Canada once again turned to Orenda to produce an engine for the Avro Arrow project. Avro had originally intended to use one of three different engines from the UK (one produced under license in the US), but all of these projects ran into delays. Orenda quickly responded with the **PS.13 Iroquois** design. Once again Orenda was able to prototype the new engine in a short period of time, starting development in 1953, completing it in May 1954 and building and running the prototype by December 1954. During the testing period, the Iroquois was the most powerful jet engine in the world, rated at 19,250 lbf (85.6 kN) dry, 25,000 lbf (111 kN) afterburning. It was aerodynamically matched for peak performance at 50,000 feet (15,200 m) altitude and Mach 2 speed. After some 7,000 hours of development testing, up to a simulated altitude of 70,000 feet (21,300 m) and a forward speed of Mach 2.3, the Orenda Iroquois program was canceled, along with the Arrow on 20 February 1959.



Orenda Engines

In 1955 another reorganization led to the creation of **Orenda Engines**, as well as **Avro Aircraft**. Avro Aircraft would later disappear due to the cancellation of the Arrow, but Orenda had a major overhaul business that allowed them to weather the storm.

In late summer 1959, the RCAF selected the Lockheed F-104 as their new day fighter, to be built by Canadair. Orenda was given the contract to build its engines, the Canadian government having already obtained a production license for the General Electric J79. The first engine was completed in December 1960, just 14 months after the first drawings were received. Orenda built J-79 engines for the RCAF and for the U.S. Mutual Aid program. Some of the 478 engines delivered by Orenda are still in service with the Turkish and German Air Forces.

In early 1962 Orenda also won the production contract for the General Electric J85, for use in the Canadair CL-41 trainer. The first engine, known as the J-85-CAN-40, was delivered in September 1963, the last in October 1965. Production of a derivative engine, the afterburning J-85-CAN-15, began in 1967 when Canadair was licensed to produce the Northrop F-5 aircraft for the RCAF. Between June 1967 and May 1974, 609 engines were produced for the Canadian, Dutch and Venezuelan Air Forces.

Orenda also started manufacturing industrial gas turbine packages. Some 150 units were sold for gas compression, oil pumping, electric generation and other applications with installations in Canada, United States, Venezuela, New Zealand, China, England and UAE. Most of these units are still operational, with many of the heavy-duty units exceeding 150,000 operating hours.

Orenda Aerospace

Magellan Aerospace was formed in the 1980s, primarily from the assets of the Canadian operations of Fleet Aerospace, Fleet Industries. Over the next few years they aggressively expanded by purchasing a number of Canadian aerospace companies, including Orenda, which they renamed as **Orenda Aerospace**, the name which it operates under to this day. In addition to producing complete gas turbine engines, the precision manufacture of critical rotating and stationary engine components for leading OEMs since the 1970s, including General Electric, Pratt & Whitney and Rolls-Royce. Repair and overhaul remains a major business as well.

In the late 1970s, race car driver Lee Muir started a project to adapt the 8-cylinder aluminum-block Chevrolet CanAm engine for aviation use as **Thunder Engine**. In 1994, Orenda purchased the design, completing the certification process in 1998, and putting it on the market as the Orenda OE600. They marketed it primarily as a replacement for 600 hp turboprops, notably the Pratt & Whitney PT-6. The engine offered better altitude performance as well as somewhat better fuel economy. They also set up a conversion facility as **Orenda Recip** at the former CFS Debert in Debert, Nova Scotia, and started certifying conversions for various popular aircraft, starting with the DHC-2 Beaver, with plans to offer similar conversions for the DHC-6 Twin Otter, King Air and various crop dusters powered by the Wright R-1830 or eastern-block designs of similar power. Magellan dropped the project in the early 2000s, reportedly after \$100 million had been invested in development. There is an effort underway to restart production in Texas, but it is unclear if this is continuing.

References

- Paul B. Dilworth
- Magellan Aerospace Corporation's Magellan Repair, Overhaul & Industrial - formerly Orenda

See also

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Category: Aircraft engine manufacturers of Canada

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