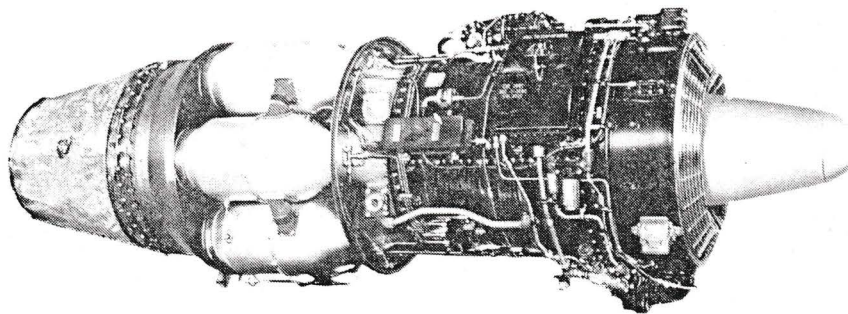


ORENDA

THE ORENDA — brainchild of A. V. Roe Canada Ltd., but now the adopted product of Avro Canada's recently formed aero engine subsidiary, Orenda Engines Ltd. — got its start back late in the summer of 1946, when the RCAF requested Avro Canada to design and develop an engine for the CF-100. The specifications called for an engine of a thrust equal to that of the largest engines then on the drawing boards in the U.S. and U.K.

First Run: On February 10, 1949, the Orenda was run for the first time and by February 10, 1950, it had accumulated 2,000 hours of running time. It was first flown in Avro Canada's converted Lancaster flying test bed on July 13 of 1950. The engine has been continuously under development since its first running and several different models have been produced in quantity for both the CF-100 and



the Canadair Sabre. To date, more than 1,750 Orendas of all marks have been produced.

Official ratings for the various Orendas have never been published, but unofficial figures for the Series 1 and 2 place the take-off dry ratings at 6,000 lbs. st./th., whereas the Series 8, 9, and 10 are rated at 6,500 lbs. st./th. The current production series are the Orenda 11 and the Orenda 14 which have a rating of 7,200 lbs. st./th. These two engines, which are practically identical, differ from earlier models in that they have a two-stage turbine. The Orenda 11 is for installation in the Avro CF-100/4, while the Orenda

14 goes in the Sabre 6, which is in production at Canadair.

Outline: The Orenda is an axial-type turbojet engine, with a ten-stage compressor, six large combustion chambers and a two-stage turbine (in the latest models). Diameter is 42 in.; length, 122 in. approx.; frontal area, 9.6 sq. ft.; weight, 2,700 lbs.; fuel consumption (normal) 1.0 lb. per lb./th./hr.; oil consumption 1.0 lb./hr.

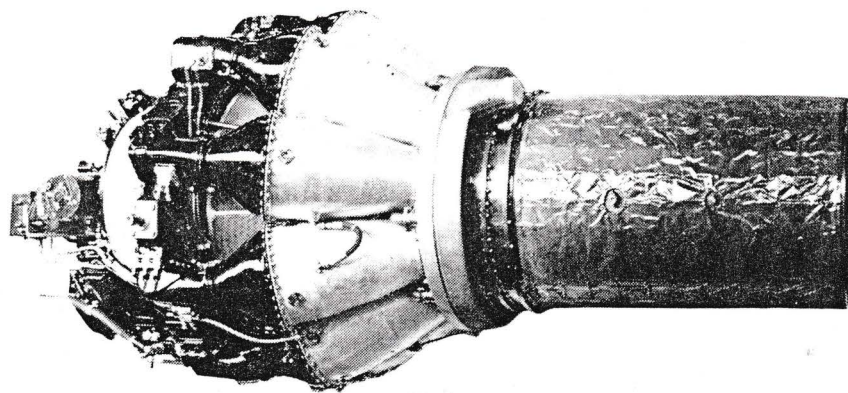
The names of several organizations have been connected with the development of an afterburner for the Orenda, but to date no version of the engine has made an appearance with this short-term thrust-boosting device.

NENE

A LIMITED number of Nene 10 turbojets are being manufactured in Canada at the Montreal plant of Rolls-Royce of Canada Ltd., which was originally established primarily as a Canadian source of Nene spares for the engines that were being supplied for RCAF T-33's by Rolls-Royce Derby.

A total of some 900 Nenes were ordered for this purpose from the British parent firm, the plan being to supply the bulk of these from British production, but to assemble a token number (about 50) from Canadian-manufactured components, production of which would be well advanced by the time British deliveries were nearing completion.

Type Test: Subsequently, the first Canadian-built Nene completed its 150-hour type test on September 28, almost exactly three years after plans to build a Canadian plant were announced early in September of 1951. Production of Nene components is sub-contracted by Rolls-Royce of Canada to a con-



siderable extent, and this is reflected in the fact that total employment at the Montreal plant is less than 400.

In Canada, the Nene 10 is used in the T-33AN Silver Star jet trainer, replacing the Allison J-33 with which the original Lockheed T-33A is powered. Though the dimensions and general layout of the two engines are practically identical, the Nene has a superior thrust/weight ratio, being of both higher thrust and lighter weight.

Long Life: The Nene 10 is one of the earliest successful turbojet engines, having been designed back in 1944 to meet a British Air Ministry specification for an engine with a minimum thrust of 4,000 lbs. weight not exceed-

ing 2,200 lbs., and a maximum diameter of 55 in. How well Rolls-Royce remained within the size limitations, while producing an engine that is now rated at 5,100 lbs. th., is indicated by the engine's 49.5 in. diameter and weight of 1,653 lbs., both well under the maximum figures laid down by the MoS specification.

The Nene is a relatively simple design employing a single-stage double entry centrifugal compressor with nine straight-flow combustion chambers and a single-stage turbine. In general layout it bears a strong resemblance to a scaled-up version of the earlier Derwent, though it is, in fact, an entirely different design.