

(Aircraft & Airport Photos)

The intricate mass of test equipment may be seen in this photo taken just before the engine was started up on the test bed. RIGHT—Winnett Boyd, chief designer of the gas turbine division, A. V. Roe, Canada Ltd., proudly explains the fine points of the engine to A/M W. A. Curtis.



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Canada's First Jet Engine Avro Chinook Makes Debut

Designed and built by Canadians at Malton, birth of the Chinook gas turbine engine marks the beginning of a new industry in the Dominion - - Jet planes and bigger engines being built

"It's a great day for Canada."

That phrase, spoken simply and sincerely by Air Marshal W. A. Curtis, CB, CBE, DSC, ED, Chief of Air Staff, sums up in six words the official running of the Avro Chinook, Canada's first jet engine, designed and built for the Royal Canadian Air Force by A. V. Roe Canada Limited.

As the Chief of Canada's air force pushed the button to set into motion the starting mechanism of the Chinook, he marked the culmination of the first phase of a new development in Canada's aviation history—the design and manufacture of gas turbine jet engines.

But, paradoxically enough, the maiden run of the Chinook marks only the end of the beginning. For with the Chinook ends a story started in 1944, but begins a story which will carry Canada's name to the top in the roster of world air powers. It is only

the beginning of Canada's role as a major contender in the jet-conscious air world of today.

The occasion of the first running, attended by top brass from the air force, was marked by a flawless performance by the sleek looking jet engine mounted on the special rig housed in a building erected at Malton especially for this purpose.

"Right up to Design"

Initial reports on the test runs, which were carried out not only on March 24 but on subsequent days, are that the Chinook measured up to every standard set for it by the designers.

"Right up to specifications. Every figure right on design," was the official announcement upon completion of the first phase of tests.

Oddly enough, the Chinook, fine

engine though it is, probably will never leave the ground. This intricate design of whirling blades and whistling air masses is but a development engine, and it will be sacrificed on the altar of progress. From the running of the Chinook will be gained the necessary knowledge which will make possible the building of greater and more powerful gas turbine power plants which will power the C-102 four-engine transport now building at Malton, and the top-secret twin-jet fighter taking shape behind barred doors in a closely guarded section of the same factory.

While for the official party on the first day the Chinook was run only at idling speed (3,000 rpm) and speeded up to 5,000 rpm, on later runs it was speeded up for short periods. Following these series of tests, the entire engine was dismantled and closely inspected for signs of weakness, sug-

Lack of vibration in the engine despite the fact it is delivering a punch of 2500 h.p., is proven by this picture of a nickel standing on edge on one of the combustion chambers under the watchful eye of an engine technician whose ears are protected by special pads.

gestions of faults and indications of wear.

This inspection found the Chinook still "right on design."

Important though they are, the subsequent runnings of the engine and the inspection following testing, lacked the intensity of the initial running.

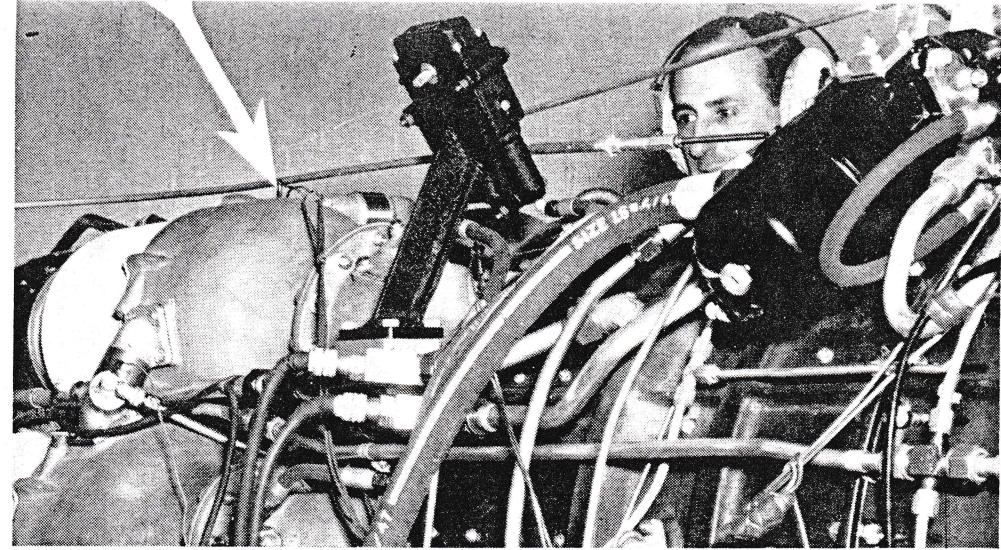
We were allowed to inspect the engine closely before the run, and all the instruments and methods of checking it were explained to the press and government representatives on hand.

The area immediately behind the test cell was roped off to prevent any of the unwary from stepping into the path of the jet exhaust when the engine was running, while the front of the cell, which was open to allow free flow of air to the engine, is protected by a strong wire screen.

Specially Constructed Cell

Between the fitting room and the test cell there is a substantial fire door, while the cell itself is sealed off from the observation chamber by a specially constructed wall of concrete, steel and tile, insulated by air spaces. Observers watch the engine through heavy windows of armor glass, with a large mirror positioned to give them clear vision of the opposite side of the installation.

Inside the chamber during the running are two engineers, their ears protected from the shrill scream of the engine by heavy ear pads. They main-



(Aircraft & Airport Photo)

tain a close watch on the engine as it runs, and feel the combustion chambers for "hot spots", signalling the progress of their tests to the watchers in the observation chamber.

In their inspection of the combustion chambers, the engineers actually lay their hands lightly on the engine, but amazing enough the front sections of the "pots" are comparatively cool due to their construction which provides a flow of air within them.

It was a tense moment as the CAS pushed the starter button and the compressors began to hum. As soon as the engine was running under its own power, the crew of 12 in the test team got down to work.

Temperatures, pressures and speeds were constantly checked as the engine idled to 3000 rpm, and then double checked minutely as it was speeded up to 5000 rpm.

To demonstrate the stability of the engine, a nickel was balanced on edge on the upper combustion chamber

while photographers were allowed to venture close enough to record the fact for posterity.

While that day in March is indeed a milestone in Canada's air story, the jet story actually has its beginning four years earlier when this development was sponsored by the Department of Munitions and Supply under the leadership of the Right Honorable C. D. Howe. It was in 1944 that Turbo Research Limited commenced preliminary investigations on gas turbine engines.

With the end of the war, there was some slackening of this research as the urgency of the need was relaxed, and it was in 1946 that the next step was taken when Avro Canada absorbed the Turbo Research organization and transferred it to Malton.

Birth of New Industry

At Avro Canada a design team and a manufacturing organization have been created and trained in this new skill. The facilities for progressive development work in this new field have also been established, and the running of the Chinook signifies the birth of a new aircraft engine industry in Canada.

Coincident with this birth of a new industry in Canada, is the birth of new opportunity for young Canadian engineers, who, for the first time, are offered a full scope in the aircraft engine field.

Though they cannot see the engine which is behind a specially constructed wall, the observers know everything that is going on inside the machine by reading their charts and gauges on the test panel, a portion of which is seen in this picture.

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