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By WILLIAM STEVENSON

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Delta-wing jets built for Arctic and northern Canadian operation, boasting both long-range and faster-than-sound speeds.

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Largest in Commonwealth

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now... just. Our figure is 14,850."

Most startling result of Avro Canada's impact on Canadian industry has been discovery of a new, high-temperature metal alloy which may solve the major problem in atomic propulsion of aircraft.

The alloy, still a top secret, is under joint Anglo-Canadian development by atomic scientists. It makes possible a light screen around the atomic reactor which would replace the kerosene-burning combustion chamber of jet-engines. Attempts to build such a screen with other metals had left U.S. researchers with impossibly large aircraft projects, because a tremendous weight of the older metals was necessary to protect aircrews. With the light new alloy, it is unofficially estimated that four pounds of uranium would carry an atomic-powered plane round the world non-stop several times.

Forced to keep silent on these secret defence projects, Avro Canada officials today watched the birth of the British Commonwealth's largest jet-engine factory. Among them was the company's founder and dean of British aircraft manufacturers, Sir Roy Dobson. The chunky Englishman had just emerged from five weeks eating and sleeping in a Manchester hangar while his newest project, a four-jet delta-wing bomber, prepared for initial test flights.

He had these reasons for nursing the new plant into life:

It must produce powerful Orenda jet-engines to equip 200 CF-100 Canucks and three times as many Canadian Sabres by the end of 1953.

The government has placed a \$65,000,000 order for Orendas destined to power Sabres alone. Other orders have been placed for engines to power other aircraft, including the CF-100 and the Jetliner, which is undergoing U.S. trials as a military transport.

These engines already develop 6,500 pounds of thrust, enough to drive 100 powerful autos at full throttle. Experimenters must try to boost it into the world's most powerful engine again. Sir Frank Whittle, inventor of the jet and unofficial adviser to Canadian jet men, says the engine is so good it can produce 50 per cent. more power.

Orenda-powered Sabres are wanted now in Korea. They can deal Russian MIG's, according to U.S. air force pilots, a knockout punch. The first are expected to join Canadian-built Sabres already in Korea, but powered by U.S. engines.

A serious shortage of jet engines forced construction of the new Orenda plant within 12 months. Now it's hoped to get the CF-100 program rolling. Sixty of the twin-jet planes will be moving out of Avro Canada sheds once mass-production of the engines has started. Already 4,000 skilled workers are assembling the engines in the new plant, and the force will be doubled to bring production beyond 100 engines a month.

Twelve thousand men and women work in the Malton plants and another 15,000 craftsmen across the country are geared to the government program for both engines and planes.

Canada has struggled against heavy odds for this competitive position among the world leaders. More than 2,000 British technicians and skilled workers have been imported to overcome almost total inexperience in the jet field. British and U.S. companies have been persuaded to locate in the country to win Canada self-sufficiency in the manufacture of high-precision parts. Today, there are 400 firms across Canada feeding parts to Avro Canada, and both engine and plane production have become wholly Canadian.

Shifting defence requirements delayed smooth production of the all-Canadian CF-100 Canuck, which first flew in January, 1950. It was months later that the government announced Avro Canada would go into production; previously, its role was one of research and development. Today, despite the colossal problems of setting up assembly lines and finding qualified workers, Canucks made their first public appearance in their RCAF guise of Arctic warplanes.

Canada had one tremendous advantage to offset the handicaps facing defence planners when, at the end of World War II, they decided to make the country an independent leader in jet aviation. She had raw materials lacking among her rivals but essential to jet engines—cobalt, nickel, chromium and tungsten.

Engine Grows ¾ of Inch

These were necessary for metal alloys able to withstand the orange heat of jet engines. The Orenda, for instance, gets so hot it grows three-quarters of an inch in length. Inside, tips of 1,700 turbine blade whistle round above the speed of sound; and each blade holds an individual position in turbines and compressors that multiply their weight 20,000 times when spinning.

Firms across Canada had to find the know-how and the workers to meet the unprecedented demand for parts. Among the new, heat-resistant alloys was one called Shawinigan X. Tied in with its production now are three Quebec companies, at Montreal, Grand Mere and Three Rivers.

Behind Avro Canada lie huge government funds, an additional \$10,000,000 in British money and the backing of the mammoth Hawker-Siddeley group of England. The group's aircraft stole the last Farnborough air show—shop-window for British aircraft.

This is what such backing means to Canada generally and the Toronto area in particular:

An "industrial revolution," producing a hard core of skilled workers vital to any country caught up in rearmament or trying to hold its own industrially. This core scarcely existed when the jet program began to roll seven years ago.

New factories have been established to produce exclusively for jet projects, but capable of switching to other skilled manufactures. British and U.S. firms have been persuaded to open branch factories here. One refrigerator company has diverted its considerable resources to production of jet-engine blades, for instance.

Exploitation of raw material

sources is being encouraged. A new ferro-silicone plant at Beauharnois, Que., for instance, has replaced Norwegian supplies for the Malton company.

A reserve of machine-tools, badly needed throughout the free world, is being created. There are 600, worth more than \$21,000,000, in the new Avro Canada plant.

Employment figures are expected to reach 15,000 by next year at the company. Workers are buying their homes on a 10 per cent. down-payment basis, so that a \$3,600-a-year machinist can buy a \$10,000 house for only \$1,000 down. About 1,000 such homes are expected by the end of the year to be occupied by men in all categories. Michael Cooper-Slipper, a company test-pilot, was one early buyer.

New homes are within 15 minutes' drive of the plants. But in a further effort to reduce traffic problems, the company has contributed \$250,000 toward a new road leading to the Orenda plant.

Road to Cost \$650,000

"The road is costing \$650,000 altogether," said Malcolm McRae, chairman of Malton village council. "It will open up industry here and in Toronto township, for which there'll also be a water supply, again thanks to the jet plants. Water pumped up from Lake Ontario for the company is also being made available here. We've 3,500 people in the village now. We expect 25,000 within five years."

Just so there won't be any mistake about it, council now refers to Malton as "the aviation centre of Canada." And its local Roman Catholic church has become "Our Lady of the Airways."