Summing Up the Chinook

Avro Canada's Chinook represents a significant achievement, though it has now been pushed from the limelight by the Orenda. By the middle of 1949, incidentally, the Chinook had had over 400 hours of running time. Some months ago Avro released complete details on this engine and they are presented herewith.

Primarily a development engine built to supply the answers for larger jet engines, the Chinook consists of a nine-stage axial flow compressor, six combustion chambers, a single stage turbine, and an exhaust tail cone.

Compressor Rotor

The compressor has a compression ratio of 4.5:1. The rotor is supported at the front end in a self-aligning roller bearing, and at the rear end in a duplex-type ball bearing secured in a self-aligning mounting. The drive for the accessories gear box is taken from the front shaft.

The ninth stage disc of the compressor rotor is of steel and the rest of the discs are of aluminum alloy; the blades for the first and second rotor stages are manufactured from stainless steel, and those for stages three to nine from aluminum alloy. The blades are secured by either dovetail or fir tree serrations.

Compressor Stator Assembly

The magnesium-alloy stator casing is cast in halves, and has one stage of precision cast aluminum alloy guide vanes followed by nine stages of stator blades made from aluminum alloy and secured to stator rings of the same material.

Combustion Chambers

Each combustion chamber contains a perforated flame tube of Nimonic 75; the combustion chamber consists of a cast aluminum-alloy front portion and a fabricated mild steel rear portion. The six chambers are interconnected.

Turbine

The turbine consists of a Jessop G. 18B steel disc with an integrally forged stub shaft, fitted with Nimonic 80 turbine blades which are secured by fir tree serrations at the roots. The stub shaft is mounted in a roller bearing and is connected to the rear end of the compressor shaft through a flexible coupling, which compensates for angular misalignment. The turbine casing is fabricated from stainless steel, and the nozzle guide vanes are of Vitallium.

Exhaust Assembly

The exhaust tail cone and the tail pipe are fabricated from stainless steel. The tail pipe is heat insulated by glass wool blankets encased in shields of silver foil under an aluminum outer covering.

Fuel System

A Lucas duplex fuel injection nozzle in each combustion chamber is supplied with fuel by two Lucas multi-plunger, variable stroke, positive displacement pumps, which are connected in parallel to duplicated manifold pipe lines. Overspeed governors are integral with the pumps and an inter-connected servo-system is incorporated; the maximum delivery pressure is 1,100 pounds per square foot.

Other components of the fuel system comprise a Lucas flow-control unit with an integral throttle valve, a shut-off cock, low pressure filter, a pressure regulating valve, a combined solenoid and torch ignitor reducing valve, and two torch ignitors. Fuel consumption (c.r.) is 1.00 pound per pound of thrust per hour.

Oil System

The oil system is of the dry sump type with vane and Gerotor type pumps supplying oil under pressure to the main bearings. One pressure and four scavenge units are incorporated. An integral oil tank, filter, and a pressure regulator complete the system. Oil consumption (cr.) is two pounds per hour.

Starter

The Chinook is started by a Rotax electrical starter operating from a 24 volt D.C. supply; two Rotax ignition coils are installed.

fighter, similar to the Lockheed F90.

The initial design, to Royal Australian Air Force specifications has been drawn and approved. Commonwealth has been allotted $1,120,000 for the design, study and development work to the prototype stage. It is likely that two prototypes will be built.

The most radical ideas incorporated and performance expectations are on the top-secret list. It can be said, however, that the plane will resemble very closely in design, the recently test-flown Lockheed XF-90 — newest twin jet penetration fighter of the United States Air Force.

The CAC project will be much heavier and bigger than this USAAF, single-seater fighter with its gross design weight of 25,000 lb., almost approaching the specifications of a light bomber. It will be a twin seater and its nose will house the latest search radar gear. It will have a needle nose and a decided sweep back of 35 degs. in the wings, rudder and elevator surfaces. It will have cabin pressurization for operation at very high altitudes — 6 or 8 miles up — and will be equipped with the latest type ejection seats for the crew.

It will be engined with the latest Rolls Royce centrifugal jets. The prototypes will probably be powered with advance-type Nenes, already projected by CAC, but probably has been designed to take the later and more powerful Tay engine, designed to develop 6,000 lb. static thrust at take-off.

These engines will make the machine capable of at least sonic speed — well above 600 mph. in level flight.

Design study of a new machine has been in progress for nine months and the building of the first prototype is expected to begin in the second half of 1950.

The design is the original conception of CAC's design team.

Briefly

•A contract for a number of **Alvis Leonides** 550 hp engines has been awarded to Alvis Limited of Coventry, England, by the British Ministry of Supply. The engines will power a number of Percival Prince aircraft which has been adopted by the Royal Navy for training and communications, as well as other roles.

•The latest version of the Boeing XB-47 is powered by **six General**