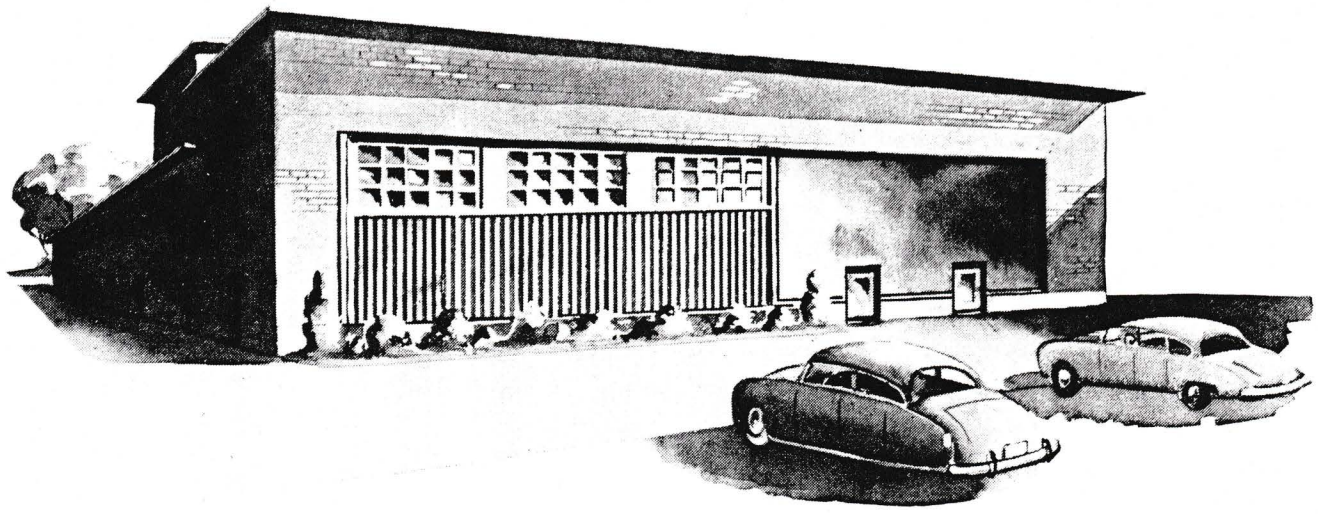


AT AVRO CANADA

A New Gas Turbine Lab

A NOTEWORTHY event, and one of considerable interest to Canada's aviation community, took place October 5 when Sir Thomas Sopwith, chairman of the board of the Hawker Siddeley Group, laid the cornerstone for a new $500,000 jet engine and research laboratory at A. V. Roe Canada Limited's Malton, Ontario, plant.

The laboratory, which will employ 100 engineers and technicians, is a private venture of Avro Canada. The new 31,000 sq. ft. building will have air conditioning, soundproofing, special lighting, and maximum fire safety, as well as other special arrangements for completely up-to-date laboratory operations.

With the completion of construction of the laboratory, the Avro Canada Gas Turbine Division will have a complete and closely integrated facility for research, development, and manufacturing. And each such phase of operation will have its own buildings and difficulties, all within a half-mile radius of each other—excepting the plant at Nobel, Ont. There, full scale facilities are conducting aerodynamic and thermodynamic tests on engine main components. Nobel is self-contained.

The new building will consist of five major sections:

Mechanical Laboratory: Here will be special rigs for testing main bearings, gearboxes, rotating seals, and similar components. A structure rig will permit the testing of complete engines or major structural components under simulated flight load conditions to determine stresses. A photo-elastic unit will also be provided to assist in stress analyses.

Vibration rigs to investigate blade vibration characteristics will be included, together with an overspeed pit designed to take complete compressor or turbine rotor assemblies. A small machine shop will permit on the spot preparation of test pieces and rig maintenance.

Materials Laboratory: This Lab will contain full equipment for chemical analysis, X-Ray diffraction, tensile and hardness testing, corrosion and plating investigations, thermal shock testing, and welding investigations.

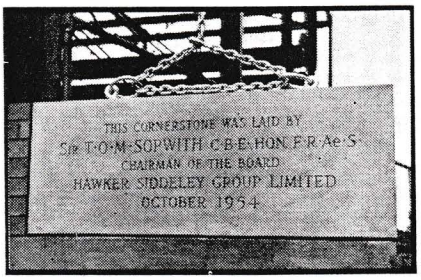
Instrument Laboratory: In this section will be a service department to maintain, repair and calibrate engine and equipment instrumentation used in the Gas Turbine Division; an electronics section for the development of specialized electronic devices; an instrument manufacturing shop for precision work, and a small welding shop.

Aerodynamics Laboratory: This will contain a six inch wind tunnel for aerodynamic investigations on small models and an electrolytic tank for two-dimensional pressure and flow determinations.

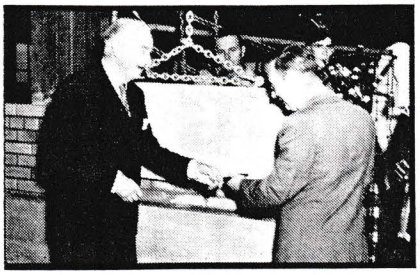
Fuel Systems Laboratory: This lab will have test rigs for all fuel and oil system components and complete

(Continued on page 58)

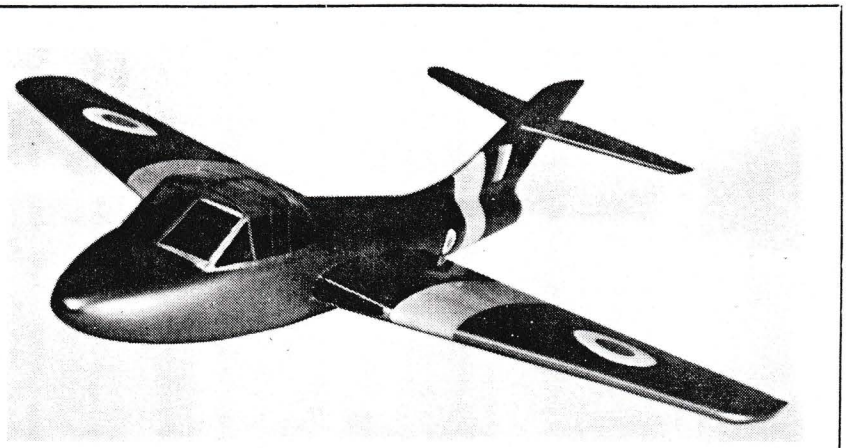
In attendance at the ceremony were, L to R: Q. Shirriff, M. Alexander, A/M Curtis, Sir Thomas, G. Nash and Sandy A. F. MacDonald.



At top of page is artist's conception of new laboratory, while immediately above is the corner-stone which was laid at the ceremony.



Here is Sir Thomas (L) with Gene Carlton (R) of the new Avro Gas Turbine Laboratory, who assisted in the cornerstone laying.



JET TRAINER PROPOSAL: Shown in model form, as presented at the SBAC Display, is the Boulton Paul P.24, a turbojet-powered basic trainer. Plans call for the side-by-side jet trainer to be powered by an Armstrong Siddeley Viper ASV-5 developing 1,640 lb. th. Maximum gross weight is quoted at 5,380 lbs.; span, 32 ft.; length, 30 ft. 6 in. Design cruising speed is 320 mph and maximum speed will be 380 mph. The wings are swept slightly; a wide-track, retractable tricycle gear is used.

What this means to the non-instrument pilot who finds himself in below-limits weather is self-evident.

Arcon has no effect on pitch or roll. It is not an automatic pilot, its chief purpose in life being only to sense any directional change as it is occurring, then apply appropriate force in the rudder system to cancel out this change. It has no "memory" of its own, and won't return an airplane to its original line of flight, though it may be slaved to a directional gyro to accomplish this purpose.

However, Lear says, even without the addition of a directional gyro, the Arcon has demonstrated unbelievable ability to hold the airplane on course to within a few degrees of the desired heading. The instrument does its work automatically and leaves the pilot free to concentrate on other flight activities. It is a proportional type instrument, applying to the rudder exactly the right amount of force to cancel out the tendency to turn.

The complete Arcon is made up of three separate units — a rate gyro weighing 1.25 lbs., a servo unit (which operates continuously, but imparts corrective forces to the rudder system only when they are needed) weighing 7.5 lbs., and the amplifier, weighing 3 lbs.

MEETING OF MINDS

(Continued from page 26)

on "RCAF Training Operations". Final paper of the technical sessions was "Design Aspects of the Boeing Model 707", by Kenneth C. Gordon, manager of commercial sales for Boeing Airplane Company, who hinted strongly that Boeing intended to do some energetic pushing of commercial sales of the first U.S. jet airliner.

GAS TURBINE LAB

(Continued from page 33)

systems including a temperature-controlled, dust-free room for tear-down and assembly of the finely machined components. An ignition system laboratory will be provided to test ignition equipment under normal and simulated high altitude conditions.

With the exception of the aerodynamics laboratory, these facilities are intended not only to serve the engineering groups in development programs, but also to provide assistance to the Production and Sales & Service Departments when required. An additional task will be to carry out quality control checks, particularly on materials and fuel system components.

In declaring the cornerstone well and truly laid, Sir Thomas said that: "The tremendous growth of aviation in Canada has been paced by the advances in Canadian research and development of both aircraft and aero engines. Here, in this building of science to be erected on this site, Canada will have engineering facilities for aero engine development second to none for its type and size anywhere on

this continent. You will be hearing more from Avro Canada Gas Turbine Division design and engineering teams before long."

Present with Sir Thomas at the ceremony were: Lady Sopwith; Sir Frank Spriggs, managing director of Hawker Siddeley Group; Sir Roy Dobson, Avro Canada chairman of the board; W. R. McLachlan, vice-president & general manager of Avro Canada's Gas Turbine Division; Crawford Gordon, Jr., Avro Canada president & general manager.

Among the special guests were a number of World War I pilots, all of whom had flown Sopwith aircraft at that time. These included: Air Marshal W. A. Curtis, vice-chairman of the board of Avro Canada; Gerry Nash, who holds the doubtful distinction of having been shot down by von Richtofen while flying a Sopwith Triplane; Mel Alexander, a Toronto executive; A. F. Sandy MacDonald, sales manager for de Havilland; Quinn Shirriff, and Stanley McCrudden. All flew with the Royal Naval Air Service.

QUALITY IN ENGINEERING

(Continued from page 24)

by USAF Secretary Harold E. Talbott, "In the present air atomic age, it is imperative that we maintain at all times qualitative superiority." And qualitative superiority has its roots in top quality engineering.

John W. Truran of Jarry sums it up more simply, "Top quality in engineering, once achieved, gives pride to all the people that have a hand in producing it, and low cost with lasting satisfaction, to the customer."

MENTOR

(Continued from page 19)

clear expect for the odd puff of cumulus. In the air, we encountered practically no turbulence save a mild bumpiness at the 3 - 4,000 ft. level.

The airplane in which Flight Lieutenant Bill Lawler and I flew was, like the others delivered to the RCAF, almost identical to the USAF version, the only variations being slight ones in cockpit and instrument layout. Actually, this particular machine, which bore the markings "PX 105", was one of the first delivered by Canadian Car & Foundry to the RCAF, and since it was being used for test purposes by CEPE, it was fitted with some special test instrumentation, such as a Potter Flowmeter. It also had a radio compass, which, I understand, is not to be standard equipment in the RCAF version. Seems this equipmen is quite heavy and its weight might cut down performance too much. The Mentor test course will learn to use the radio compass in Harvards (in which they will take a ten-hour course — though to keep them "pure" of Harvard influence, which could prevent a true assessment of the Mentor test, they will not actually take off or land the bigger machine).

Touch of Color: PX 105 featured a natural aluminum finish relieved only by the bright yellow vertical tail surfaces, and the normal RCAF markings. Evidently all the RCAF Mentors are finished in this manner, and do not have the traditional "all yellow" paint job.

Normally, the instructor sits in the rear seat and the pupil in front; after some discussion it was decided that