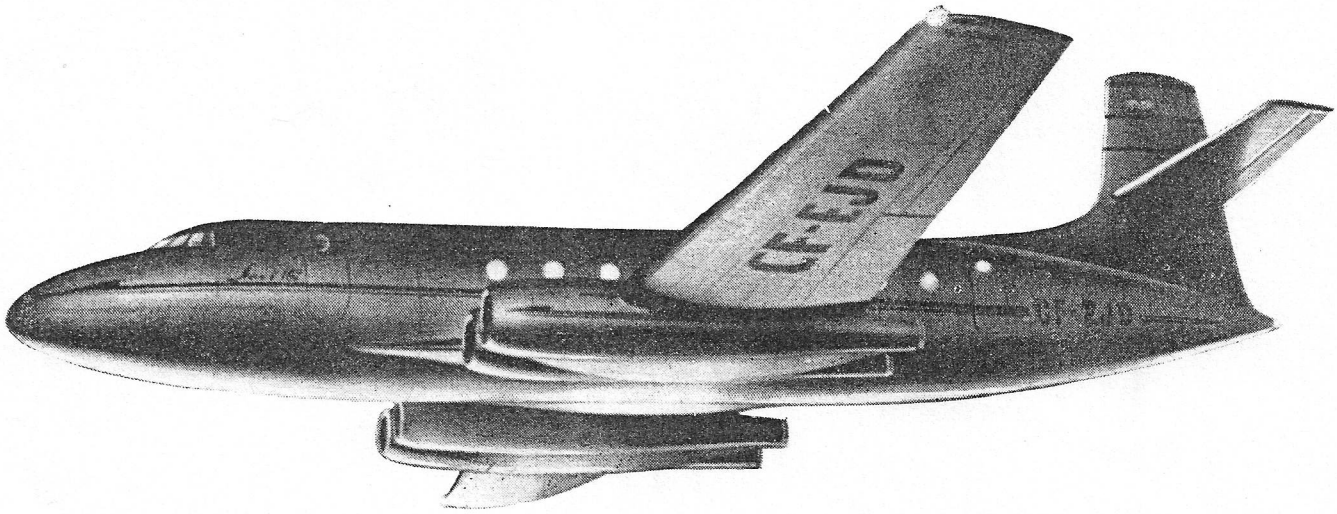


THE C-102 PROGRESSES

Rapidly Nearing Completion is Canada's Avro C-102 Which Will Probably be the First Pure Jet Commercial Airliner to be Offered to the Air Lines of the World

A day early in 1949 will be a proud one for the Canadian aircraft industry, for at that time the prototype of the Avro Canada C-102 will first take to the air. This initial flight will mark Canada's emergence not just as a leader in the building of large transport planes, but also in the field of new type development.

It is significant that to date only two other all-jet transports have been flown, the Vickers Viscount, which was the first to fly, and the four-jet Avro Tudor VIII. It should be noted that these aircraft are not pure jet transports but conversions of reciprocating engine types, to be used for experimental purposes. Because until very recently American heavy airplane builders regarded the jet transport as not being practical for the immediate future, they continued designing their transports to be powered by reciprocating engines or prop-jets. It is now understood that recent developments have changed the American viewpoint, so that some of the large companies are now working on jet transports.

Aircraft and Airport recently paid a visit to the Avro Canada plant at Malton, Ontario, to see what progress was being made in construction on the C-102 and found that the covering in of component parts was well advanced. The date when some of the major assemblies at least should reach the joining stage does not appear to be too far away.

Little by little, information on the C-102 is being released by its builders, so that now, with the information that has accumulated to date, and inspections of the mock-up at the Malton plant, as well as the artist's conception of the finished product which accompanies this article, it is possible to draw a fairly complete picture of the finished airplane.

The C-102 airframe has been designed and developed entirely at Malton by Avro engineers. The only components that are not Canadian are the engines, four Rolls-Royce Derwents; the tricycle undercarriage, by Dowty; the wheels, tires, and brakes, by Dunlop; and the pressurization equipment, which is by Normalair Limited.

The new transport is designed to accommodate from 36 to 40 passengers and to cruise at about 400 mph. at 30,000 feet. The ceiling is approximately 40,000 feet. So far no figures have been quoted on the range, which is described only as short to medium. However, the airplane was designed specifically for Canadian domestic routes so the reader is left to draw his own conclusions.

Power is by four Rolls-Royce Derwents set in units of two under the wing on each side. From the artist's drawing it might appear as though the engines were set right into the wing, but this is not so, for they are very definitely below. The cowlings of the two units that go to make up each power installation are joined by an airfoil section which is built smoothly into the wing section. Methanol injection is to be used in the power plants for tropical conditions, which are sometimes encountered even in Canada.

The jets are set in very close to the fuselage. This wing-engine combination enables the moment effect, or offset, caused by an engine failure to be

The Avro Jet Fighter

No official release concerning the new Avro all-weather jet fighter, the XC-100, which is being built near Toronto, has been forthcoming from either the RCAF or A. V. Roe officials. A description of the experimental fighter was given in a recent issue of the American aeronautical journal, Aviation Week, but this description is claimed by the RCAF and Avro to be inaccurate. The Avro Company says that the project is still a secret one as far as it is concerned.

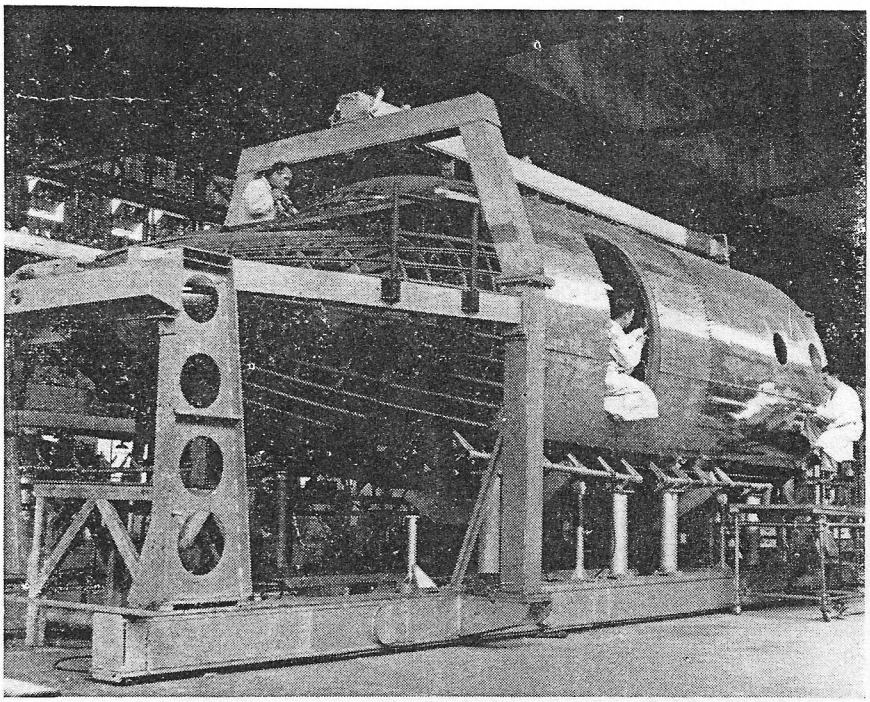
handled much more easily. The special long wing root fillets noticeable in the artist's drawing have been designed to reduce upflow on the fuselage. Originally the airplane was designed to be powered by two larger power plants, but the design was later modified to incorporate four engines to improve performance and increase safety.

The wing section used is a standard NACA airfoil and both the leading and trailing edges taper to the squared tips. The horizontal stabilizer is set high on the vertical fin, with both of these also having squared tips. Electrothermal de-icing is to be used on the leading edges of the wings and the empennage. This type of de-icing equipment consists of resistance wires embedded in rubber which is fitted to the contour of the leading edge.

The tricycle undercarriage is made by Dowty and each of its units is equipped with double wheels. The undercarriage is quite low, so low in fact that mechanics can work on the engines while standing on the ground. The advantages of this are obvious.

The fuselage mock-up gives the impression of stockiness which is not so evident in a scale model of the C-102. This impression is perhaps caused by the fact that the wing is set well back on the fuselage and at the same time has extra long wing root fillets. In addition, the jet nacelles are fairly long so that there is no sharp contrast between the length of the nacelles and the fuselage, as is to be found in airliners powered by reciprocating engines.

The fuselage interior is noteworthy for its roominess. The seats in the mock-up are arranged in two rows of two on each side, leaving ample aisle space. There are two lavatories, one forward and one aft. There is also a compartment aft for baggage and express stowage, as well as space for a galley. This cabin layout is not a standard one and will be altered to suit the customers' specifications, depending on how many passengers he wants his airplane to carry, whether he wants only one lavatory on it, and so on.



A recent picture of the Avro C-102 shows that construction is well advanced on the nose section, as well as on other major components. Actually the covering in of this and other sections has progressed considerably since this photograph was taken by the Avro photographer.

Two prototypes of the C-102 are to be built, but the first will carry testing equipment only, so will not have its cabin fitted out. The second one however will be more complete. Similarly the first prototype will have just one door, but the second will have both front and rear passenger doors, as in the mock-up.

The question of why there should be two doors immediately arises. Since the airliner is intended for comparatively short, fast hops, it is quite conceivable that the designers are trying to make it possible for the C-102's buyers to get the utmost in utilization. More utilization means faster turnarounds. Since jets require no warm-up period about the only things that could delay getting the airplane back into the air would be the problems of refuelling and of getting the disembarking passengers off and the new passengers on board. Is it not likely that this is perhaps what was in mind when two doors were incorporated in the design? In fact there does not seem to be any other logical explanation for having two doors in an airplane the size of this one. Incidentally, provision is made for pressure refuelling, and also for the more conventional type for use at airports not having pressure refuelling equipment.

The flight deck is the height of simplicity compared to some airliners we have seen. This is of course mainly because of the comparatively few engine instruments that are needed with jets. The windscreen is semicircular in shape and visibility is excellent. Forward visibility is aided to a marked degree by the way the nose falls off sharply from the base of the windscreen. The nose section, incidentally, is slightly flattened on top, a feature that does not in any way detract from the sleekness of its lines.

The crew consists of a captain and a first officer, but an extra jump seat is provided behind the pilots' seats for an observer or an extra crew member. A jump seat is also provided for the stewardess at the rear of the passenger cabin, beside the after door.

All the windows are circular in shape because it was found that this type is lighter than the square, and at the same time are somewhat stronger, an important consideration when pressurization is to be utilized. Interestingly enough, design engineers at Avro Canada are considering the possibility of blow-outs in the same light as they consider major structural failures. In other words they believe that a blow-out and the resultant rapid decompression is just as dangerous to passenger safety as the failure of a wingspar, which is so rare in modern aircraft as to be considered non-existent. When engineers think this way, it is a certain thing that they will turn out a safe airplane.