Commercial Aircraft of the World

A "FLIGHT" COMPILATION

Caravelle

Sud-Aviation: Société Nationale de Constructions Aéronautiques, Paris.

THE Caravelle is among the select band of transports that, by anticipating an airline need, promise to achieve commercial success before they enter service. Although it will be spring next year before the first Caravelles are flying on Air France's routes to London and North Africa, orders have already been placed by five airlines and, in the case of S.A.S., the original firm order for six has been doubled. First of the European short-haul jets (the decision to build the Caravelle was taken in 1952), the aircraft has established, in concept and configuration, a pattern for this class of airliner; and the advantages conferred by rear-mounted engines include an interior quietness that sets a new high standard for passengers' accommodation.

The first prototype aircraft flew on May 27, 1955, and the second prototype just under a year later, on May 6, 1956. The first production aircraft, destined for Air France, flew on May 18 this year. Two other partially complete airframes have been produced, one for a simulated 30,000 hr water tank fatigue test and another for resonance and static strength tests. The present production programme is based on a five per month rate early in 1960 but could be raised to 7 or 8 a month if needed. Sud-Aviation stated recently that 110 items of equipment are manufactured by British companies. The foremost of these is Rolls-Royce, who supply the Avon RA.29 engines, and other suppliers include Dunlop, Flight Refuelling, Graviner, Hobson, Automotive Products, Teddington Aircraft Controls, Venner and SPE.

COMMERCIAL HISTORY The first order for Caravelles was placed by **Air France** in February 1956, 12 aircraft being ordered and an option being placed on a further 12. The first delivery will take place later this year and the entire fleet should be in operation late in 1960. Air France has already accumulated considerable proving experience with the second prototype, which they received in June 1956 for route trials and for scheduled freighting over their European and North African networks.

For over a year after the Air France order no further sales were effected. Then in June 1957 **S.A.S.** ordered six for delivery in 1959 and optioned a further 19 (six of these have since become firm orders). The following October saw **Varig** order two with options on a further three, delivery to take place in 1959. This year has seen three more carriers place firm orders for delivery in 1960; **Aero O/Y (Finnair)** ordered three in January; **Air Algerie** ordered three in March; and, most recently, **Royal Air Maroc** signed for two Caravelles in May. **Sabena** has also been mentioned as a likely Caravelle customer.

STRUCTURE **Fuselage** The fuselage is of conventional multi-stringer monocoque construction with circular frames. A cylindrical section, 126in diameter and 53ft long—nearly half the total fuselage length—forms the bulk of the pressurized total volume of 6,120 cu ft. This includes three baggage and freight holds: an upper rear compartment with a volume of 200 cu ft, an under-floor front hold with a volume of 200 cu ft and an aft hold with a volume of 90 cu ft. The cantilevered engine nacelles are carried from two heavy frames in the rear fuselage and the surrounding area is stiffened with robust frames and pierced vertical and horizontal webs. The fuselage contains 32 windows of curvilinear shape, four of which are inward-opening escape hatches. Two passenger entrances are provided, one by a door 30in×72in fitted with a downward-opening stairway in the rear fuselage (which also serves as a tail support), and another one in front where there is a sliding door 36×67in on the port side. The floor is stressed to 120 lb/sq ft.

Wing Structural basis of the wing, the clean shape of which is unbroken by nacelles or pylons, is a three-spar torsion box forming an integral fuel tank. There is thus one redundant member as a safeguard against a fatigue failure. Top and bottom wing skins are taper-rolled and the torsion box is stiffened with spanwise stringers, quarter-crescent-shaped ribs and pierced baffle-ribs. The N.A.C.A. 651212 section wing originally included a variable camber leading edge, but with no appreciable decrease in performance this has now been discontinued in favour of a fixed member.

Undercarriage Responsibility for the undercarriage has been taken by Hispano-Suiza, who supply the four-wheel bogie main gear spaced on a 17ft track, and the nose gear, which is steered hydraulically through an included angle of 100 deg. The wheelbase is 38ft 7in. Dunlop manufacture the wheels, the Maxaret anti-skid brakes and the tyres, which are inflated to 124 lb/sq in.

POWERPLANT The Rolls-Royce Avon RA.29 engines of 11,700 lb thrust are more powerful than those with which Comet 4s will be equipped. Each engine is attached to two cantilever beams by means of connecting links at the front and by two trun-