

## COMMERCIAL AIRCRAFT OF THE WORLD

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**Weights:** Max. take-off, 170,860 lb; capacity payload, 38,600 lb.

**Payload accommodation:** Cabin volume, 7,075 cu ft; cabin length, 81ft; max. width, 14ft 10in; max. seats, 107.

**Fuel capacity:** 6,710 Imp. gal (8,081 U.S. gal).

**Performance:** Cont. cruise speed, 15,000ft, 154,500 lb, 235 kt (270 m.p.h.); range A (max. payload), 1,930 n.m. (2,220 st.m.); range B (max. fuel), 3,415 n.m. (3,580 st.m.).

**S.O.30P Bretagne** Derived from the S.O.30N (Gnome Rhone N 48/49) which first flew on February 26, 1945, and from the S.O.30R Bellatrix (Gnome Rhone 14.Rs) which first flew on November 6, 1945, the Bretagne went into production to an Air France specification with P. & W. engines. About 50 were built up to 1954 and delivered to Aigle Azur (five), Air Maroc (six), Cosara (four), and to the French Services. It is believed that Cosara (a Saigon independent) still use four, and Bretagnes are still performing yeoman service with the French armed forces. Two versions were built, the 30P-1 with 2,000 h.p. P. & W. R-2800-43, and the 30P-2 with 2,400 h.p. P. & W. R-2800-CA18. The following data is for the 30P-1:—

**Powerplant:** Two P. & W. R-2800-43 driving Curtiss Electric 13ft 5in propellers.

**Dimensions (both versions):** Span, 88ft 2in; length, 62ft 2in; wing area, 925 sq ft.

**Weights:** Max. take-off, 41,700 lb; capacity payload, 8,500 lb.

**Payload accommodation:** Cabin length, 40ft 8in; max. width, 9ft; max. seats, 43.

**Fuel capacity:** 1,040 Imp. gal (1,250 U.S.).

**Performance:** Cont. cruise speed, 20,000ft, 37,500 lb, 218 kt (250 m.p.h.); range A (max. payload), 539 n.m. (620 st.m.); range B (max. fuel), 1,680 n.m. (1,930 st.m.).

**S.E.161 Languedoc** A development of the Bloch 160 of 1937 and of the Bloch 161 which flew in 1939, the Languedoc was put into production with Gnome Rhones in 1945, the first flying on September 17 of that year. Some 70 with P. & W. engines were built for Air France and LOT, and others for the French Air Force and Navy. Five are still in airline service with the Spanish operator Aviaco.

**Powerplant:** P. & W. R-1830-SC3Gs of 1,200 b.h.p. driving Hamilton 10ft 10in propellers.

**Dimensions:** Span, 96ft 5in; length, 79ft 7in; wing area, 1,200 sq ft.

**Weights:** Max. take-off, 52,250 lb; capacity payload 8,650 lb.

**Payload accommodation:** Cabin length, 36ft 8in; width, 6ft 7in; max. seats, 33.

**Fuel capacity:** 1,580 Imp. gal (1,900 U.S.).

**Performance:** Cont. cruising speed, 7,500ft, 50,700 lb, 189 kt (217 m.p.h.); range A (max. payload), 1,080 n.m. (1,240 st.m.); range B (max. fuel), 1,510 n.m. (1,740 st.m.).

**S.E.210 Caravelle** The decision to build the Caravelle was taken in January 1953 after a design competition: a French Government contract was awarded in July 1953 to Sud-Est Aviation (which combined with Ouest-Aviation to become Sud-Aviation in 1957), and the first Caravelle flew on May 27, 1955. Air France signed a contract for an initial order for 12 in February 1956. From May to November, 1956, the airline flew 600 hr on scheduled cargo proving-flights. Following certification in April 1959, Air France inaugurated scheduled services on May 12, 1959. The Caravelle is now in extensive European service with Air France and S.A.S., and other export deliveries are in progress.

The order book accounts for 55 aircraft, as follows:—

Air France, 24 (current); S.A.S., 17 (current delivery—four are for Swissair); Varig, 2 (current); Air Algérie, 4 (January-March 1960); Finnair, 3 (February-April, 1960); Royal Air Maroc, 1 (May 1960); Alitalia, 4 (May-July, 1960).

The Caravelle is the pioneer of two particular trends: short-range jet transportation (i.e., over stages of up to 1,000 n.m.) and rear-mounted jet engines, not the least important advantage of which is the unexcelled degree of cabin-quietness. *Flight* reference: July 25, 1958.

There are four main variants of the Caravelle, each being an exploitation of Rolls-Royce powerplant improvements:—

**Caravelle 1** The first production deliveries are of this variant, which is powered by Avon 522s. Without structural modification, higher-powered Avons can be fitted, the designation then becoming Caravelle 3. An operator's drawing appears on page 605.

**Powerplant:** Two Rolls-Royce Avon 522 (RA.29/1) of 10,500 lb static thrust each.

**Dimensions:** Span, 112ft 6in; length, 105ft; height, 28ft 7in; wing area, 1,579 sq ft.

**Weights:** Max. take-off, 95,900 lb; landing, 91,338 lb; zero fuel, 77,160 lb; capacity payload, 18,450 lb; weight less fuel and payload, 58,600 lb.

**Payload accommodation:** Cabin volume, 3,000 cu ft; baggage and freight volume, 494 cu ft; cabin length, 52ft 6in; width, 9ft 10in; height, 6ft 10in; max. usable floor area, 646 sq ft; dimensions of largest door, 6ft x 2ft 5in; max. seats, 80 (five abreast).

**Fuel capacity:** 4,060 Imp. gal (4,980 U.S.).

**Performance:** Cont. cruise speed, 397 kt (456 m.p.h.) at 32,800ft and 80,900 lb; balanced field length, max. weight, sea level, I.S.A., 5,900ft; I.S.A.+15 deg C, 6,750ft; 5,000ft, I.S.A., 9,900ft; landing distance from 50ft, 5,315ft; range A (max. payload) 1,390 n.m. (1,600 st.m.); range B (max. fuel), 2,380 n.m. (2,740 st.m.); corres. payload, 5,400 lb; corres. cruise speed, 398 kt (458 m.p.h.).

**Caravelle 3** Powered by Avon 527s (RA.29/3) of 11,700 lb static thrust, this 99,208 lb version is the standard production aeroplane. Basic price: £950,000.

**Powerplant:** Two Rolls-Royce Avon 527 (RA.29/3), of 11,700 lb static thrust each.

**Dimensions:** As above.

**Weights:** Max. take-off, 99,208 lb; landing, 94,468 lb; zero fuel, 77,160 lb; capacity payload, 18,450 lb; weight less fuel and payload, 58,640 lb.

**Payload accommodation:** As above.

**Fuel capacity:** As above.

**Performance:** Cont. cruising speed, 435 kt (500 m.p.h.) at 32,800ft and 81,900 lb; corres. specific fuel consumption, 1.0; balanced field length, max. take-off weight, sea level, I.S.A., 5,900ft; I.S.A.+15 deg C, 6,700ft; 5,000ft I.S.A., 8,250ft; landing distance from 50ft, 5,530ft; range A (max. payload), 1,520 n.m. (1,750 st.m.); range B (max. fuel), 2,300 n.m. (2,645 st.m.); corres. payload, 8,100 lb; corres. cruise speed, 411 kt (473 m.p.h.).

**Caravelle 6** This 1961 production version is again heavier—up to 103,620 lb—and takes advantage of the 12,500 lb thrust Avon 531 (RA.29/6). Both Caravelle 1s and Caravelle 3s can be converted to this standard, with changes to wheels, brakes, fin and other items. Conversion costs (as given by Air France) about £25,000.

**Powerplant:** Two Rolls-Royce Avon 531 (RA.29/6) of 12,500 lb static thrust each.

**Dimensions:** As above.

**Weights:** Max. take-off, 103,616 lb; landing, 98,650 lb; zero fuel, 78,269 lb; capacity payload, 18,450 lb; weight less fuel and payload, 59,220 lb.

**Payload accommodation:** As above.

**Fuel capacity:** As above.

**Performance:** Cont. cruise speed, 436 kt (501 m.p.h.) at 32,800ft and 92,000 lb; corres. specific fuel consumption, 0.975; balanced field length, max. take-off weight, sea level, I.S.A., 6,050ft; sea level, I.S.A.+15 deg C, 6,800ft; 5,000ft, I.S.A., 8,300ft; landing distance from 50ft, 5,840ft; range A (max. payload), 1,820 n.m. (2,095 st.m.); range B (max. fuel), 2,300 n.m. (2,645 st.m.); corres. payload, 11,650 lb; corres. cruise speed, 418 kt (481 m.p.h.).

**Caravelle 7** A change of powerplant, to the Rolls-Royce RB.141/3 of 14,340 lb static thrust, signifies this projected variant for 1963, which will have a gross weight of 110,230 lb and a fuselage stretch of about 3ft. Seat-mile costs will be about the same as for previous versions, but speed will be up by more than 25 kt, and payload-range will be improved.

**Powerplant:** Two Rolls-Royce RB.141/3 by-pass turbojets of 14,340 lb static thrust each.

**Dimensions:** As above, except length, 108ft.

**Weights:** Max. take-off, 110,230 lb; landing, 104,985 lb; zero fuel, 81,570 lb; capacity payload, 19,400 lb; weight less fuel and payload, 62,170 lb.

**Payload accommodation:** As above, except for one extra seat row, max. seats being 85.

**Fuel capacity:** As above.

**Performance:** Cont. cruise speed, 448 kt (515 m.p.h.) at 32,800ft and 92,000 lb; balanced field length, max. weight, sea level, I.S.A., 6,000ft; sea level, I.S.A.+15 deg C, 6,650ft; landing distance from 50ft, 6,270ft; range A (max. payload), 2,200 n.m. (2,530 st.m.); range B (max. fuel), 2,380 n.m. (2,740 st.m.); corres. payload, 16,600 lb; corres. speed, 442 kt.

**TUPOLEV** Doyen of Russian aircraft designers, Andrei Nikolaevich Tupolev, like his rival Ilyushin, has produced a notable family of bomber and transport aircraft. Among these is Russia's first jet airliner, the Tu-104, a development of the so-called Badger bomber.

**Tu-104** This twin-jet airliner has been built in three versions. The first was in effect a "prestige" aircraft, seating 50 passengers in somewhat sombre luxury, whereas the second version, the Tu-104A, seats 70 in a more austere, but nevertheless comfortable, manner. The Tu-104B, which is becoming Aeroflot's standard jet, has a longer fuselage and can seat up to 100 in five-abreast seats. A number of speed-with-load records are held by the Tu-104A and B, both of which are in Aeroflot service to the extent of many scores (certainly well over a hundred).

**Powerplant:** Two Mikulin AM-3 turbojets of about 19,000 lb thrust (the Tu-104B has improved engines of the same type, believed to give lower specific fuel consumption).

**Dimensions (Tu-104A and B):** Span, 113.32ft; length (Tu-104A), 127.45ft; length (Tu-104B), about 131ft.

**Weights:** Empty, 43,000 lb approx.; max. take-off, over 160,000 lb.

**Payload accommodation (Tu-104B):** In this version the front pressure bulkhead is farther forward than on the Tu-104A. The first cabin seats 30, the second 15, the third 55. Luggage and cargo compartments are 424 cu ft greater in capacity than those of the Tu-104A; the loading doors are built into the side panels and not into the bottom of the fuselage, as on the "A" version.

**Performance:** Normal cruising speed, about 435 kt (500 m.p.h.); max. speed 550 kt (633 m.p.h.); max. range, over 2,500 miles.

(Continued on page 620, after two double-page drawings)

### Sud Armagnac (Pratt & Whitney R-4360-B13)

