Commercial Aircraft of the World

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Bristol Britannia 312 of BOAC (Bristol Siddeley Proteus 765 turboprops)

Performance: Opt cost cruising speed at 1,500ft and 40,000lb, 216kt (248 m.p.h.); corres specific fuel consumption, 0.11; take-off distance to clear 35ft, ISA, SL (one engine failure, grass surface, max take-off weight), 1,440ft; typical take-off run, concrete surface, max take-off weight, 625ft; CAR landing field length (ISA, SL, concrete surface, 1.6 factor, max landing weight), 1,345ft; typical landing run, concrete surface, max landing weight, 395ft; range A (max payload), 750 n.m. (860 st. m.); range B (max fuel), 1,420 n.m. (1,630 st.m.); corres range B payload, 4,000lb.

Breguet 945 A smaller version of the Breguet 942 is under study for operation from 1,000ft hot and high-altitude airstrips. Designated Breguet 945, it would weigh about 20,000lb and be powered by two Turboméca Turmo IIIDs. Payload would be about 3,300lb and could be carried for more than 900 miles at almost 240 m.p.h.

BRISTOL • *Bristol Aircraft Ltd, Filton House, Bristol, England (Member of the British Aircraft Corporation).*

Bristol 170 Freighter The prototype Bristol Freighter first flew on December 2, 1945, and was originally offered in two main versions; the Freighter with nose loading doors, and the Wayfarer all-passenger version without nose doors. Initial 170s had a span of 98ft and square tips, but the Freighter Mks 21, 21A and 21E and Wayfarer 22A of 1948 had a 10ft increase in span and a max weight of 40,000lb; the engines were two 1,700 b.h.p. Bristol Hercules 672s. The Freighter 31 and 31E have increased power (Bristol Hercules 734 of 2,050 h.p.) and take-off weight (44,000lb), together with a dorsal fin, while the Mk 32, designed for Silver City, has a 5ft 4in longer nose to accommodate three small cars instead of two. A total of 214 Bristol 170s were built for both civil and military operators; 64 are in airline service with 18 carriers.

Mk 21 All-freight version with flight deck only soundproofed. **Mk 21A** "Mixed" version, 16-20 passengers and freight. **Mk 21E** "Mixed" version with movable bulkhead. Entire cabin soundproofed. **Mk 22A** Passenger version seating 32-36. No nose doors. **Mk 31** As Mk 21. **Mk 31E** As Mk 21E. **Mk 32** With accommodation for 2-3 cars and up to 23 passengers.

Bristol Freighter Mks 31 and 32

Powerplant: Two Bristol Hercules 734 piston engines of 2,050 h.p. each driving D.H. 14ft propellers.

Dimensions: Span, 108ft; length, 68ft 4in (Mk 31), 73ft 8in (Mk 32); height empty, 24ft; wing area, 1,487 sq ft.

Weights: Max take-off, 44,000lb; landing, 44,000lb; capacity payload, 14,400lb (Mk 31), 12,000lb (Mk 32); weight less fuel and payload, 28,084lb (Mk 31), 30,553lb (Mk 32).

Payload accommodation: Cabin volume, 2,360 cu ft (Mk 31), 2,900 cu ft (Mk 32); cabin length, 49ft (Mk 31), 57ft 2in (Mk 32); max width, 8ft; max height, 6ft 7½in; nose door, 6ft 8½in × 6ft 7½in.

Fuel capacity: 1,172 Imp gal.

Performance: Cont cruise speed, 166kt (191 m.p.h.) at 10,000ft at 44,000lb; corres fuel consumption, 1.3 st.m.p.g.; balanced field length, max take-off weight, SL, ISA, 3,700ft; SL, ISA+15°C, 4,100ft; 5,000ft, ISA, 4,800ft; landing distance from 50ft, 2,280ft; range A (max payload), 695 n.m. (800 st.m.); range B (max fuel), 1,610 n.m. (1,850 st.m.); corres payload, 5,000lb; corres speed, 143kt.

Britannia 100 First of the Britannia family of big turboprop airliners, powered by Proteus 705 turboprops and seating up to 92 passengers, the 100 was produced exclusively for BOAC. The prototype 100, G-ALBO, first flew on August 16, 1952. Fifteen, designated 102, were built for the Corporation from 1954-56, production being subsequently concentrated on the larger and more powerful 250/300/310/320 series described below. The 102 inaugurated the first Britannia services on February 1, 1957, and a *Flight* special issue of that date described the background to its introduction into service. Further *Flight* references were given on p 129 of that issue; other articles will be found in the issues of July 6, 1956; November 1, 1957; and July 25, 1958. Price paid by BOAC (fixed in April 1955) was £768,000 per aircraft.

Powerplant: Four Bristol Proteus 705 turboprops of 3,900 e.h.p. each driving D.H. four-bladed, 16ft propellers.

Dimensions: As for 320, except length, 114ft, and height, 36ft 8in.

Weights: Max take-off, 155,000lb; landing, 125,000lb; zero fuel, 113,000lb; capacity payload, 25,000lb; weight less fuel and payload, 88,000lb.

Payload accommodation: Cabin volume, 5,150 cu ft; baggage and freight volume, 750 cu ft; cabin length (incl pantry and lavatory), 76ft; max width, 11ft 7in; max height, 6ft 8in; max usable floor area, 810 sq ft; dimensions of largest doors, 70in × 31.5in.

Fuel capacity: 6,690 Imp gal (8,034 US gal).

Performance: Cont cruising speed, 315kt (362 m.p.h.) at 20,250ft and 135,000lb; corres specific fuel consumption, 0.647lb/b.h.p./hr; balanced field length at max take-off weight, SL, ISA, 6,320ft; at SL, ISA+15°C, 7,350ft; at 5,000ft, ISA, 8,020ft; landing distance from 50ft, 5,200ft; range A (max payload), 2,945 n.m. (3,385 st.m.); range B (max fuel), optimum cruise, 3,690 n.m. (4,250 st.m.); corres payload, 13,480lb; corres cruising speed, 285kt (328 m.p.h.).

Britannia 250 This is the generic type-designation of the military version of the Britannia, 23 of which are being delivered to RAF Transport Command by Bristol, and by Short Brothers & Harland from the assembly line operated at Belfast since December 1953.

Britannia 252 This is a passenger-cargo version, three of which were originally ordered for Government trooping work by the Ministry for operation by British independent airlines. In the spring of 1959, as a result of a change in policy, these aircraft were transferred to RAF Transport Command. Maximum payload is 28,000lb, including 84 passengers and freight which is accommodated on the forward strengthened portion of the floor, and loaded via an enlarged door.

Powerplant: As for 320.

Britannia 253 This is essentially an all-cargo transport, built entirely to military requirements. Twenty are being delivered to RAF Transport Command. A special feature is the heavy "floating" floor designed by Shorts (*Flight*, August 9, 1957). The forward freight door has the same dimensions as that of the 252. Max payload is 34,000lb.

Powerplant: As for 320, except that the military designation of the Proteus 765 with water injection is 255.

Weights and performance data: page 586 of *Flight*, November 20, 1959.

Britannia 300 Three of these were built, one for the Ministry and two, designated 302, which were bought by Aeronaves de Mexico. The 300 has the capacity and power of the 305, but less tankage—6,690 Imp gal instead of 8,580 Imp gal and a max take-off weight of 170,000lb.

Britannia 305 A total of five of this model were built; two are in service with British United Airways (**307**), two with Transcontinental (**308**), and one with Ghana Airways (**309**). They are in all major respects comparable with the 310 model, the designation 305 being applied when, in 300 form, they were modified to bring them as closely as possible to 310 standard, including in particular the addition of the 310 wing with 8,580 Imp gal.

Britannia 310 This is the standard long-range version as operated by BOAC (17 312s); El Al (four 313s); CPAL (six 314s and two 320s); British United Airways (two 317s); Cubana (three 318s); Cunard Eagle (one 318); Ghana Airways (one 310).

The 310, first of which was flown on December 31, 1956, entered service across the North Atlantic with BOAC on December 19, 1958.

All data as for 320, except: capacity payload, 34,900lb; weight less fuel and payload, 93,100lb, and range B payload, 23,500lb.

Britannia 320 This was the standard production commercial Britannia until production ceased in 1959. It is a development of the 310 incorporating numerous detail engineering improvements. Of six built, two have been bought by Canadian Pacific Airlines. Two of Cubana's 318s are 320-standard, as also are one BOAC 312 and one El Al 313. Basic price new was £1.07m. *Flight* description, July 25, 1958.

Powerplant: Four Bristol Proteus 765 turboprop engines of 4,450 e.h.p. driving de Havilland Hydromatic four-blade 16ft propellers.

Dimensions: Span, 142ft 3.5in; length, 124ft 3in; height empty, 37ft 6in; wing area, 2,075 sq ft; aspect ratio, 9.76.

Weights: Max take-off, 185,000lb; landing, 137,000lb; zero fuel, 128,000lb; capacity payload (ZFW-limited), 34,369lb; weight less fuel and payload, 93,631lb.

Payload accommodation: Cabin volume, 5,877 cu ft; baggage and freight volume, 910 cu ft; cabin length, 86ft 3in; max width, 11ft 7in; max height, 6ft 8in; max usable floor area, 883 sq ft; dimensions of largest door(s), 70in × 31.5in; max seats, 149.

Fuel capacity: 8,580 Imp gal (10,300 US gal).

Performance: Cont cruising speed, 345kt (385 m.p.h.) at 22,000ft and 150,000lb; corres specific fuel consumption, 0.585lb/b.h.p./hr; balanced field length at max take-off weight, SL, ISA, 8,150ft; at SL, ISA+15° C, 9,600ft; at 5,000ft ISA, 11,800ft; landing distance from 50ft; 6,000ft; range A (max payload), 3,620 n.m. (4,160 st.m.); range B (max fuel), optimum cruise, 4,530 n.m. (5,000 st.m.); corres payload, 23,000lb; corres cruise speed, 310kt (357 m.p.h.).

Bristol 198 This is the project number reportedly given to the supersonic transport project which may form the basis of the £350,000 design study contract placed with the British Aircraft Corporation by the MoA in October 1960.

It is unofficially described as a light-alloy Mach 2.2 transport seating 100/120 passengers, and capable of a 3,500 n.m. stage length. Geometry would be ogival narrow-delta, and one possible powerplant six Bristol Siddeley Olympus with reheat.

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Manufacturers of commercial aircraft in the British Aircraft Corporation are Vickers-Armstrongs (Aircraft), Bristol Aircraft and Hunting Aircraft. Vickers' products appear under the heading Vickers, and Bristol Aircraft's products appear under Bristol. Hunting Aircraft are responsible for the BAC-107, which is described on the next page.