

VISCOUNT



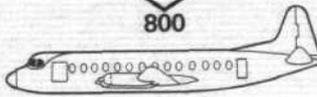
FIRST SERVICE
 1953
 BEA 701

More Power and Range



1956
 Capital 745

Longer Fuselage Short Range



1957
 BEA 802

More Power and Range



1958
 BEA 806
 Continental 812

ONE-ELEVEN



FIRST SERVICE
 1965
 BUA 201
 Braniff 203

More Power and Range



1966
 American 401
 British Eagle 301

Longer Fuselage Short Range



1968
 BEA 510

More Power and Range



1969
 BUA 501
 Caledonian 507

The One-Eleven family has evolved in a manner remarkably similar to that followed by the Viscount a decade before. The twin turbofan has more than 50 per cent higher capacity than the four-engined turboprop and a 200kt higher speed—yet the overall sizes remain remarkably similar (these drawings are all to the same scale)

One-Eleven 500s—with a total value, including spares, of £81 million. BEA's total investment in the One-Eleven is £32 million.

Design development As with the Viscount, the larger derivatives of the One-Eleven were studied from the outset. The catalyst for the firm definition of the stretched One-Eleven 500 came during 1966 when BEA progressively consolidated the specification for a Viscount replacement to serve the UK and German routes.

Initial studies of the developed One-Eleven for BEA began early in 1966, and in the ensuing months, as the basic One-Eleven design was refined and service experience expanded, the 500 project was substantially improved and the final specification agreed in September 1966 bore little resemblance to the original proposals. Several existing and potential One-Eleven customers at home and overseas had also shown strong interest in a larger model for some of their more dense traffic routes. Satisfying these requirements axiomatically became the twin objectives of the programme and the main design targets were bigger payloads and lowest costs over short distances.

The BAC One-Eleven 500 is the first dimensionally stretched development of the One-Eleven design. It has 25 per cent more seats and 15 per cent lower seat-mile costs. These major improvements were achieved by stretching the fuselage to take four more rows of seats and by extending the wing span and fitting the latest Rolls-Royce Spey 25 Mk 512-11s (as developed for the Hawker Siddeley Trident 2E). The bigger wing and more powerful engines largely counteracted the various effects on performance caused by an all-round increase in operating weights.

Design development has been the responsibility of Mr E. E. Marshall, technical director of BAC Weybridge Division and Mr K. Bentley, assistant technical director and One-Eleven 500 project design manager. Mr W. Chapman is the assistant production manager with special responsibility for co-ordination of 500 design liaison and production.

Because the One-Eleven 500 embodies much of the One-Eleven 400 the reliability of its tailor-made engineering and internationally accepted equipment standard has been fully demonstrated. The engineering similarity of all the One-Elevens enables an airline to have, perhaps, more than one version so as to optimise capacity for individual routes yet

still preserve the benefits of common equipment, spares, maintenance and training procedures.

The normal maximum seating capacity of the BAC One-Eleven 500 has been increased from 79 to 99 seats (up to 109 seats is approved). With full galley and toilet services, the unobstructed passenger cabin is retained for complete versatility of layout. BEA's Super One-Elevens have 97 passenger seats. Underfloor hold volume is 33 per cent more (from 534 cu ft to 711 cu ft) although the total volume of BEA's aircraft is actually only 645 cu ft, because of an enlarged avionics bay to accommodate the extra equipment specified.

The larger capacity is complemented by higher permitted operating weights and so engine power was increased and aerodynamic improvements made to result in a better mission performance. The maximum take-off weight for the Super One-Eleven was originally specified at 91,000lb (4,000lb over the One-Eleven 400) with maximum landing weight and maximum zero fuel weight increases of 6,000lb and 7,000lb respectively. (The certificated weights are higher still, as described later.) The BEA Super One-Eleven now carries its full 97 passenger payload on stage distances of up to 1,150 miles.

The take-off thrust has been increased by 600lb per engine by the installation of two 12,000lb-thrust Rolls-Royce Spey-25 Mk 512-14 turbofans. The new middle-distance derivative of the One-Eleven 500 (first ordered by BUA) has a further increase in gross weight to 98,000lb and is to be powered by Spey-25 Mk 514DWs of 12,550lb thrust with water injection. A particular merit of the Spey over its immediate competitors is that a reduction of cruise altitude from 25,000ft to 5,000ft increases the specific fuel consumption by only 4.5 per cent (compared to 13.5 per cent by its competitors)—this is particularly important to BEA because the permitted ceiling in the Berlin corridors is only 10,000ft.

The enhanced performance of the 500 was obtained by increasing the wing aspect ratio from 8.0 to 8.5 (2.5ft extensions were applied to each tip) and by the more powerful engines. This aerodynamic refinement and the additional power gave a 4 per cent higher take-off weight from a given airfield and an 8½ per cent greater allowable weight during the climb-out.

Because of the exhaustive structural programmes already undertaken with two complete test airframes and numerous detail specimens together with diverse service records, the existing One-Eleven structure proved to be an excellent datum for