COMMERCIAL AIRCRAFT OF THE WORLD

having a significantly higher maximum take-off weight.

Programme Status: Total orders, 150. Deliv-ered, 105. Production rate for A300-600/A310 will reach four per month by the end of 1988.

A320. The all-new A320 took to the air on February 22, and four aircraft are now participating in the busy development programme. These aircraft will complete l,200hr of flight testing before the CFM56-5-powered version enters service in spring 1988. The V.2500-powered A320 will fly in the summer of next year, for service entry in the spring of 1989. Despite the earlier troubles of IAE's new engine, Airbus is confident that this schedule will be met.

All of the technological firsts chalked up by the A320 since its first flight should not, however, obscure the fact that it has also been extremely successful in the marketplace. From a platform of 134 orders and 133 options at this time last year, it has moved to 287 orders and 160 options.
Just as last year's Survey was published, Northwest entered into a complex arrangement covering 100 aircraft. This includes a firm-commitment to ten examples for delivery iri 1990 and 1991, and six blocks of 15 aircraft which have to be confirmed at a series of dates beginning in 1990. In January Airbus entered into an agreement with GPA, Pacific Western Airlines, and Banque Paribas, covering 25 firm orders and 25 options for use by the joint-venture operating lease company GPA-Airbus A320. The next big order, for ten aircraft plus ten options, came in March, from All Nippon. Later in the year three A320s were included in a big order by ILFC for Airbus and Boeing

aircraft, again for operating lease.
Initial models of the 150-seat A320, desig-nated -100s, will have a maximum weight of 145,5001b (66 tonnes) and a range of around 1,900 n.m. (3,500km). From aircraft 22, to be delivered in September 1988, the uprated -200 will become the standard model, with first deliveries of CFM56-5-powered examples scheduled for Ansett. At a maximum weight of 158,7001b (72 tonnes), the -200 will have a range with 150 passengers and baggage of 3,150 n.m. (5,850km). This extended-range version will have additional fuel in the wing centre-section, and will make use of the Airbus-developed wingtip fences pioneered on the A310-300, but now being applied to all the company's latest models.
The A320 was formally launched in March 1984, although it had been "internally launched" a year earlier. Agreement was reached after the last of the sponsoring govern-ments, the British, was satisfied it would see a commercial return on its launch finance. In total, development costs were estimated at $1 • 7 million and the break-even as 600 aircraft.

The A320 has a number of features setting it apart from the present standard-bodied twins. These include full-authority, computer-driven fly-by-wire controls, gust-load alleviation, fully integrated large-screen displays in the cockpit, and side-stick controllers in place of the conventional column. It makes extensive use of carbon composites, including a composite tail-plane and fin, and has a fuselage cross-section some 19cm (7-6in) greater than current six-
abreast types. This will allow wider seats and
the use of underfloor containers with the same
base as the industry-standard LD3.
Workshares have been finalised, and will be
around 36 per cent for Aerospatiale, 32 per cent

Airbus launched the A330/A340 programme last June. There is extensive commonality despite the engine variations

for Deutsche Airbus, 26 per cent for BAe, around 6 per cent for Casa, and 2 per cent for Belairbus.

Programme Status: Orders, 287 (including all 100 of the aircraft ordered by Northwest and 25 of the 50 ordered by GPA). Options, 160. Delivered, 0. Production rate set at six and a half per month by the end of 1989, and eight per month by the second quarter of 1990.

A330/A340. Airbus Industrie launched the A330/A340 programme on June 5, on the basis of reasonably firm commitments from ten airlines for 130 aircraft (89 A340s and 41 A330s). Since then the sales position has crys-tallised, and there has been some jostling for position with MDC and the MD-11 for any customer which appeared to be wavering in its loyalty towards either aircraft. Airbus now predicts sales of 1,000 aircraft, shared about equally between the A330 and A340.
The medium- to long-range A330 and very-long-range A340 are considered by Airbus to be essentially one project. This is because they offer extensive commonality despite their different roles. They share an identical wing, basic fuselage, cockpit, and empennage. The primary difference between the two is the number of engines and engine related systems. The A330 is offered with either the GE CF6-80C2 or the Pratt & Whitney PW4000 (and not yet the RB.211-524D4D).
Following the debacle of the IAE Superfan, the A340 is offered only with the 30,6001b-thrust CFM56-5C-1. The demise of the Super-fan did force Airbus to revise and increase the area of the wing slightly to retain the promised payload-range performance. It now has wing-lets rather than the smaller wingtip "fences" used on the A300-600R.
The A340 is offered in two versions. The A340-300, carrying 295 passengers in a three-class layout over 6,850 n.m. (12,700km), and the A340-200, carrying 262 passengers in three classes over 7,700 n.m. (14,250km). The A340-300 is also available as a combi with a large door in the left rear fuselage and a flat floor (the rear part of the floor of the standard aircraft will slope up very slightly).
Total launch costs of the A330/A340 will be about $3-0 billion, with the principal partner companies receiving government launch aid of $l-66bn (Germany), $0-82bn (France), and $0-75bn (UK). Work-sharing percentages will be similar to those held by the main four part-ners on the A310/A300-600, with up to 20 per cent being offered as commercial risk-sharing ventures to other aerospace companies.

Boeing
PO Box 3707, Seattle, Washington 98124, USA <gf (206) 326-2121 ^^3 2 94 30
A number of developments since the last Flight Survey can be identified as particularly important for the Boeing company. These include continued strong sales (although not quite as fast as the previous year), very busy production lines, the launch of the 737-500, and the postponing of the 7J7. Leaving aside the activities of corporate raiders recently trading in Boeing shares, the delay in the 7J7 has been the most controversial of recent events, although the delay is of course linked to the full orderbooks and the buoyancy of the sales of current-generation aircraft and their derivatives.

The company continued to capture about 55
per cent of orders by number; rather more by
value because of the 747. The row with Airbus
about subsidies was, and continues to be,
important, but this subject has been an issue for
more than a decade and is not new. Boeing

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