

## COMMERCIAL AIRCRAFT

in parallel with 747-based derivative proposals.

Since backing away from its New Large Airplane (NLA) activities in 1995, Boeing has publicly poured all its product development energies into 747 derivatives. LAPD studies are understood to include a variety of concepts and configurations, ranging from 747 "lookalikes", a single-deck 777-based quadjet and revised NLA, to designs based on the former MDC MD-12 quadjet and unconventional configurations like the Blended Wing Body.

### FORMER MCDONNELL DOUGLAS TYPES (IN PRODUCTION)

FOLLOWING BOEING'S merger with MDC, all of the latter's current airliner models are marketed under the Douglas Products Division banner. Production of the MD-80/90 and MD-11 has been wound up during 2000. In January 1998, the MD-95 was re-designated the 717 to bring it into line with the Boeing nomenclature. The MD-17 commercial version of the Globemaster has been re-designated the BC-17X.

### BC-17X (FORMERLY MD-17)

Boeing is offering a civil version of the C-17 military airlifter, called the BC-17X. The programme has just been revived and Boeing is hoping to launch next year to enable deliveries to begin in 2004. The market for this 78t-payload, outsize freighter is put at 40-50 aircraft.

### MD-80

Developed from the DC-9 twinjet, the MD-80 series was in production for 21 years with 1,191 aircraft being produced. The model also spawned the V2500-powered MD-90. Production of both models ceased this year. An assembly line was also set up in Shanghai

(see SAIC entry).

The MD-80 began as the DC-9 Super 80, and the 155-seat one-class (135-seat two-class) basic version, called the DC-9-81 (since renamed the MD-81), entered service with Swissair in September 1980. A similarly sized "hot-and-high" version, the MD-82, entered service in August 1981, followed by the extended-range MD-83, which was certificated in October 1985. The short-fuselage 114-130-seat MD-87 entered service in late 1987, but production ceased in 1992 after 75 had been delivered.

The MD-88 was the last version to be developed. It was dimensionally identical to the MD-81/82/83 and was put into service by Delta Air Lines in January 1988. It has an upgraded cockpit, wider use of composite materials and a redesigned passenger cabin.

In January, an Alaska Airlines MD-83 crashed in to the Pacific following control problems, prompting an emergency AD affecting 1,900 DC-9s, MD-80s, MD-90s and 717s. Urgent examinations of stabiliser jackscrews and other elements of the pitch-control system were needed, after early inspections of the wreckage showed pre-crash damage to the unit.

The MD-80 is one of the types included in BAS planned major cockpit upgrade programme to help airlines address the problem of how to comply with future air navigation requirements. American Airlines is understood to be looking at upgrading its MD-80s, possibly with 717 avionics.

Meanwhile, BAS continues engineering work on a potential MD-82 Special Freighter variant, which it sees as a potentially good regional freighter in Asia. Originally set for possible go-ahead in 2004, this programme has been both accelerated and slowed down again

and is not likely to go ahead before 2004.

**Delivered: 1,191 (including 35 SAIC-built aircraft)**  
**In service: 1,180 (including SAIC-built aircraft)**

### MD-90

THE MD-90 IS A SLIGHTLY stretched, re-engined development of the long-bodied MD-80, powered by IAE V2500-D5 engines. The aircraft also has an upgraded EFIS flightdeck, a redesigned passenger cabin and carbon brakes. Production ended this year.

The MD-90 had its first flight in August 1993, and entered service with Delta in April 1995. An assembly line was also established in Shanghai which was to produce the MD-90T TrunkLiner (see SAIC).

**Ordered: 113 (including 2 MD-90 TrunkLiners)**

**Delivered: 113 (including 2 MD-90 TrunkLiners)**

### MD-11

THE MD-11 WENT into production in December 1986, becoming the first of the current generation of long-haul widebodies to go ahead. Essentially a stretched development of the DC-10 trijet equipped with new generation engines and a two-crew flightdeck, the first MD-11 was flown in January 1990, and Finnair introduced the type into revenue service in December the same year.

Both GE CF6-80- and P&W PW4000-powered versions have been delivered. The 295-seater initially struggled to meet its original performance targets, forcing MDC to introduce aerodynamic and structural changes. The last variant to be launched, the MD-11ER, exceeds the original specification by being able to carry its specification payload of 298 passengers more than 13,300km.

From the start of the programme, MDC offered a freighter version, which was introduced by FedEx in May 1991. Combi and convertible passenger/freighter versions have also been delivered. BAS offers an aftermarket cargo conversion, and a number of ex-passenger aircraft have been converted or are earmarked for conversion.

Boeing announced in June 1998 that assembly would be terminated after the 200th aircraft had been completed, and two aircraft remain to be delivered. These aircraft are in final completion and will be handed over to Lufthansa Cargo early next year. In May last year, Israel Aircraft Industries (IAI) concluded an arrangement with Boeing to become a freighter conversion and upgrade specialist on the MD-11.

The deal between Boeing and the Tel Aviv-based Bedek division of IAI includes a subcontract to carry out 40 MD-11 freighter conversions at a rate of at least five a year.

Meanwhile, the Transportation Safety Board of Canada (TSBC) has determined that fire in the forward fuselage ceiling was the prime factor in bringing down the Swissair MD-11 off Canada's eastern seaboard on September 1998.

The investigation into the accident will con-

### BOEING MD-80/90 FAMILY

	MD-81	MD-82	MD-83/88	MD-87
Length (m)	45.1	45.1	45.1	39.75
Wingspan (m)	32.8	32.8	32.8	32.8
Height (m)	9.02	9.02	9.02	9.3
Wing area (m <sup>2</sup> )	112	112	112	112
Cabin width (m)	3.14	3.14	3.14	3.14
Max take-off weight (kg)	63,503	67,813	72,576	63,503
MTOW option Max landing weight (kg)	58,060	58,968	63,277	58,060
<b>Option</b>				
Operating empty weight (kg)	37,885	37,925	38,737	35,313
Max zero fuel weight (kg)	53,524	55,339	55,339	50,803
Max payload (kg)	15,644	17,414	16,602	18,211
Powerplant	2 x 19,230lb P&W JT8D-209	2 x 20,890lb P&W JT8D-217A/C	2 x 21,690lb P&W JT8D-219	2 x 20,830lb P&W JT8D-217B/C or 2 x 21,690lb P&W JT8D-219
Standard fuel capacity (l)	22,104	22,104	263,481	22,106
Normal operating speed (kt)	340	340	340	340
Normal operating speed (Mach)	0.76	0.76	0.76	0.76
Max cruise speed (kt/mach)	499	499	499	499
Max cruising altitude (ft)	37,000	37,000	37,000	37,000
Take-off field length (m, Sea level/ISA)	2,210	2,271	2,553	1,859
Landing field length (m, Sea level/ISA)	1,478	1,500	1,585	1,430
Accommodation (1-class)	168	168	168	139
Accommodation (2-class)	144	144	144	114
Design range/typical load	2,897km/155 pax	3,798km/155 pax	4,635km/155 pax	4,395km/130 pax