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 ***Airbus A380-800***

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Introduction

In June 1994, Airbus announced its plan to develop its own very large airliner, designated the A3XX. Airbus considered several designs, including an odd side-by-side combination of two fuselages from the A340, which was Airbus's largest jet at the time. From 1997 to 2000, as the East Asian financial crisis darkened the market outlook, Airbus refined its design, targeting a 15–20% reduction in operating costs over the existing Boeing 747-400. The A3XX design converged on a double-decker layout that provided more passenger volume than a traditional single-deck design, in line with traditional hub-and-spoke theory as opposed to the point-to-point theory of the Boeing 777. The aircraft configuration was finalised in early 2001, and manufacturing of the first A380 wing box component started on 23 January 2002. The development cost of the A380 had grown to €11 billion when the first aircraft was completed.

Production

Major structural sections of the A380 are built in France, Germany, Spain, and the United Kingdom. Due to their size, traditional transportation methods proved unfeasible, so they are brought to the assembly hall (the Jean-Luc Lagardère Plant) in Toulouse in France by specialized surface transportation, though some parts are moved by the A300-600ST Beluga aircraft used in the construction of other Airbus models.

Five A380s were built for testing and demonstration purposes. The first A380, registered F-WWOW, was unveiled in Toulouse 18 January 2005. Its first flight took place at 10:29 am local time (08:29 UTC) on 27 April 2005.

On 1 December 2005, the A380 achieved its maximum design speed of Mach 0.96, over its design cruise speed of Mach 0.85, in a shallow dive, completing the opening of the flight envelope.

Initial production of the A380 was troubled by delays attributed to the 530 km (330 mi) of wiring in each aircraft. Airbus announced the first delay in June 2005 and notified airlines that deliveries would be delayed by six months. This reduced the total number of planned deliveries by the end of 2009 from about 120 to 90–100. On 13 June 2006, Airbus announced a second delay, with the delivery schedule slipping an additional six to seven months.



Airbus A380 Family

The A380 was initially offered in two models. The A380-800 original configuration carried 555 passengers in a three-class configuration or 853 passengers (538 on the main deck and 315 on the upper deck) in a single-class economy configuration.

In May 2007, Airbus began marketing a configuration with 30 fewer passengers, (525 total in three classes), traded for 370 km (200 nmi) more range, to better reflect trends in premium class accommodation. The design range for the -800 model is 15,400 km (8,300 nmi); capable of flying from Hong Kong to New York or from Sydney to Istanbul non-stop. The second model, the A380F freighter, would carry 150 tonnes of cargo 10,400 km (5,600 nmi). The freighter development was put on hold as Airbus prioritised the passenger version and all cargo orders were cancelled. Future variants may include an A380-900 stretch seating about 656 passengers (or up to 960 passengers in an all economy configuration) and an extended-range version with the same passenger capacity as the A380-800.

Although Airbus suspended work on the freighter version, it said it remained on offer, albeit without a service entry date.



Engines

The A380 is available with two types of turbofan engines, the Rolls-Royce Trent 900 (variants A380-841, -842 and -843F) or the Engine Alliance GP7000 (A380-861 and -863F). The Trent 900 is a derivative of the Trent 800, and the GP7000 has roots from the GE90 and PW4000. The Trent 900 core is a scaled version of the Trent 500, but incorporates the swept fan technology of the stillborn Trent 8104. The GP7200 has a GE90-derived core and PW4090-derived fan and low-pressure turbo-machinery. Noise reduction was an important requirement in the A380 design, and particularly affects engine design.

Both engine types allow the aircraft to achieve well under the QC/2 departure and QC/0.5 arrival noise limits under the Quota Count system set by London Heathrow Airport, which is a key destination for the A380.

The A380 was initially planned without thrust reversers, incorporating sufficient braking capacity to do without them. However Airbus elected to equip the two inboard engines with thrust reversers in a late stage of development. The two outboard engines do not have reversers, reducing the amount of debris stirred up during landing. The A380 has electrically actuated thrust reversers, giving them better reliability than their pneumatic or hydraulic equivalents, in addition to saving weight.

The APU in use on the A380 is the PW 980A APU. It is the world's most powerful APU, providing 1,800 horsepower, which is 20 percent more powerful than the largest existing APU in service. The APU primarily provides air to power the Analysis Ground Station (AGS) on the ground and to start the engines. The AGS is a semi-automatic analysis system of flight data that helps to optimize management of maintenance and reduce costs. The APU also powers electric generators which provide auxiliary electric power to the aircraft.

Construction

While most of the fuselage is aluminium, composite materials comprise more than 20% of the A380's airframe. Carbon-fibre reinforced plastic, glass-fibre reinforced plastic and quartz-fibre reinforced plastic are used extensively in wings, fuselage sections (such as the undercarriage and rear end of fuselage), tail surfaces, and doors. The A380 is the first commercial airliner to have a central wing box made of carbon fibre reinforced plastic. The composite material GLARE (GLASS-REinforced fibre metal laminate) is used in the upper fuselage and on the stabilisers' leading edges. This aluminium-glass-fibre laminate is lighter and has better corrosion and impact resistance than conventional aluminium alloys used in aviation. Unlike earlier composite materials, GLARE can be repaired using conventional aluminium repair techniques.

The A380's wing is sized for a maximum take-off weight (MTOW) over 650 tonnes in order to accommodate future versions, albeit with some strengthening required. The optimal wingspan for this weight would be about 90 m, but airport restrictions limited it to less than 80 m, reducing fuel efficiency about 10% and increasing operating costs a few percent. The stronger wing (and structure) would be used on the A380F freighter.



In January 2012 the European Aviation Safety Agency (EASA) issued an Airworthiness Directive affecting 20 A380 aircraft that had accumulated over 1,300 flights following the discovery of cracks in fittings within the wings. Fittings found to be cracked were being replaced following the inspections to maintain structural integrity. On 8 February 2012, the checks were extended to cover all 68 A380 aircraft in operation. The problem is considered to be minor and is not expected to affect operations. Airbus said the problem was traced to stress and materials used for the fittings and has since switched to a different type of aluminium alloy so aircraft delivered from 2014 onwards will not have this issue.

Avionics

Airbus used similar cockpit layout, procedures and handling characteristics to other Airbus aircraft, reducing crew training costs. The A380 has an improved glass cockpit, using fly-by-wire flight controls linked to side-sticks. The cockpit has eight 15 by 20 cm liquid crystal displays, all physically identical and interchangeable; comprising two Primary Flight Displays, two navigation displays, one engine parameter display, one system display and two Multi-Function Displays. The MFDs were introduced on the A380 to provide an easy-to-use interface to the flight management system—replacing three multifunction control and display units. They include QWERTY keyboards and trackballs, interfacing with a graphical "point-and-click" display system.



Interior

The A380's upper and lower decks are connected by two stairways, fore and aft, wide enough to accommodate two passengers side-by-side; this cabin arrangement allows multiple seat configurations. Airbus's publicity has stressed the comfort and space of the A380 cabin, and advertised onboard relaxation areas such as bars, beauty salons, duty-free shops, and restaurants. Proposed amenities resembled those installed on earlier airliners, particularly 1970s wide-body jets, which largely gave way to regular seats for more passenger capacity. Airbus has acknowledged that some cabin proposals were unlikely to be installed, and that it was ultimately the airlines' decision how to configure the interior.





Improved A380-800

From 2013, Airbus have introduced a new A380 build standard incorporating a strengthened airframe structure and a 1.5° increase in wing twist. Airbus will also offer, as an option, an improved maximum take-off weight, thus providing a better payload/range performance. Maximum take-off weight is increased by 4 t (8,800 lb), to 573 t (1,260,000 lb) and an additional 190 km (100 nmi) in range. This is achieved by reducing flight loads, partly from optimising the fly-by-wire control laws. British Airways and Emirates are to be the first two customers to receive this new option. Vietnam Airlines has shown interest in the higher-weight variant.

There were 103 aircraft in service with 9 operators as of 30 April 2013. The first aircraft entered service with Singapore Airlines on 25 October 2007 with flight number SQ380 between Singapore and Sydney. Singapore Airlines CEO Chew Choong Seng stated the A380 was performing better than both the airline and Airbus had anticipated, burning 20% less fuel per passenger than the airline's 747-400 fleet. Emirates' Tim Clark claims that the A380 is more fuel economic at Mach 0.86 than at 0.83.



Specifications: *Airbus A380-800*

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|------------------------------|---|
| Seating, typical | 525 (3-class) 644 (2-class) 853 (maximum) |
| Cargo capacity | 38 LD3s or 13 pallets (184 m ³) |
| Length | 72,75m (238ft 8in) |
| Wing span | 79.8m (261ft 10in) |
| Operating empty weight | 277,000kg (610,700lb) |
| Maximum takeoff weight(MTOW) | 560,000kg (1,234,600lb) |
| Cruise speed | Mach 0.89 (945 km/h, 587 mph, 510 knots) |
| Range, loaded | 15,700 km (8,500 nmi, 9,755 mi) |
| Service ceiling | 13,136 m (43,097 ft) |
| Engines (×2) | GP7270 (A380-861) Trent 970/B (A380-841) Trent 972/B (A380-842) |
| Thrust (×2) | 310 kN (70,000 lbf) – GP7270 and Trent 970/B 320 kN (72,000 lbf) – Trent 972/B |

Operation

Included in the files of this add-on plane is a **Checklist** document to enhance your flying pleasure!

To open the doors:

Select exit (Shift + E): 1L

Tail hook up/down (not assigned to a key binding by default): all cargo doors

Wing fold/unfold (not assigned to a key binding by default): 1R, 5R, 5L

Shift + E + 2: 2L

Shift + E + 3: 1L (upper deck)

Shift + E + 4: 1R (upper deck)

Water rudder up/down (not assigned to a key binding by default): deactivate window wipers

Patches and other engine variant models from Project Airbus at <http://www.pafs.wf/>

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Sources

A 'good' journalist never reveals his sources so I've listed mine below - Ha!

Information and publicity pictures are collated from a number of locations, primarily and in no particular order from these very good websites:

<http://en.wikipedia.org/>

<http://www.airliners.net/>

<http://www.airbus.com/>

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Recommended

Sound File: ab380snd.zip by Aaron Swindle at www.flightsim.com

This is a freeware soundset for FS2004 but isn't a real recording of the A380. Aaron made a best guess sound based on other large fan aircraft.

*He has made a soundset for FSX using recordings of the real aircraft and released via his shareware company **Skysong Soundworks** but I can't vouch for it as I don't have it.*

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As always if you have any problems please ask on the forum or send me a message via FSAirlines.

Produced for UK Direct Airways by M.Greenough UKD171

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www.planecrazy.me.uk/ukd