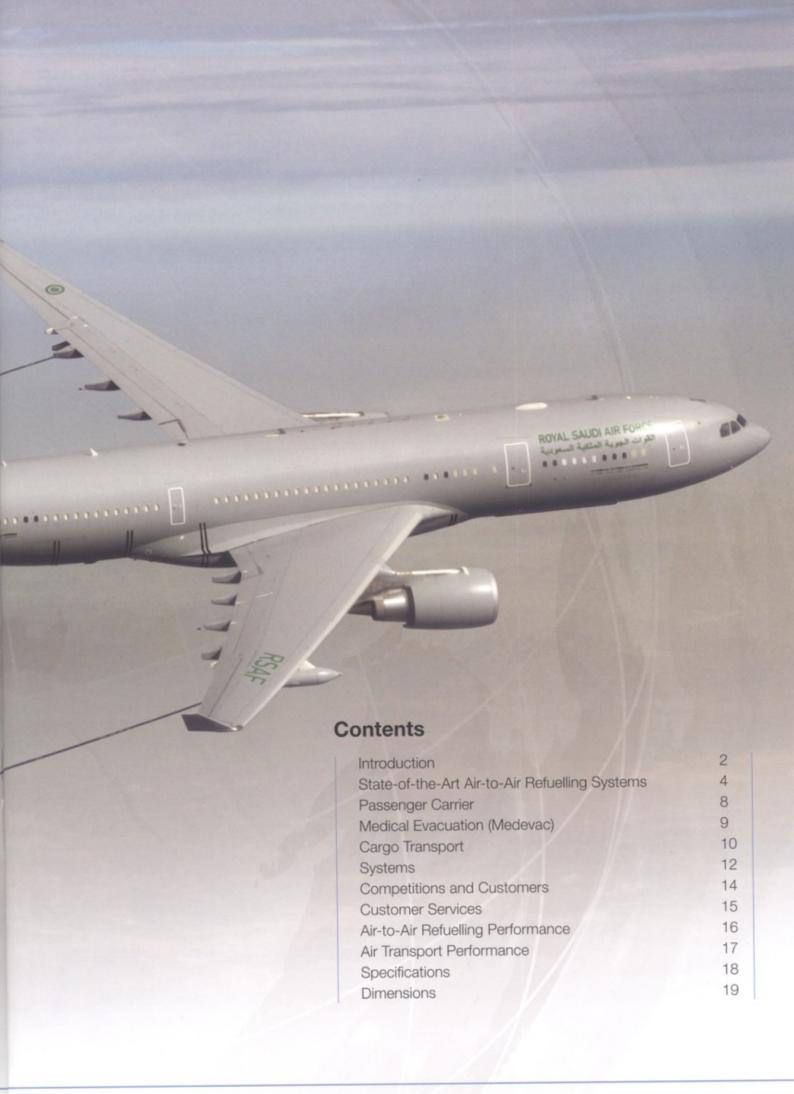


A330 MRTT The Benchmark



A330 MRTT - The Benchmark



A New Generation of Tankers

Recent conflicts have demonstrated the ever increasing need for a new generation of modern tankers that are more capable and more versatile. Aging tanker fleets no longer satisfy present requirements due to their lack of fuel capacity, range, payload and mission endurance, and their obsolescence of avionic systems and high maintenance costs.

Maintaining an adequate air refuelling capability is critical to the success of any military intervention. However, tankers now need to be able to perform more than their dedicated refuelling operations, and need role flexibility to increase the scope of their missions.

Tanker/ Transport Roles and Missions

Tanker/ Transport missions can be divided into three main categories: combat air patrol support, military aircraft deployment and airlift support.

These missions require the following capabilities:

- · Air-to-air refuelling
- Cargo transport
- · Passenger/troop transport
- Medical evacuation
- Mission planning
- Tactical communications and military navigation.

The A330 MRTT - The Benchmark

The A330 MRTT has become the market leader in its category, thanks to:

- · State-of-art air-to-air refuelling systems
- · Large basic fuel capacity
- Permanent lower deck capacity
- · Excellent payload/range capability
- Superior performance
- Significantly lower life cycle costs.

The A330 MRTT is a modern adaptable platform that can carry more passengers and more freight than any competitors while performing its air-to-air refuelling mission. It is EASA certified and is ready now.

Introduction

Airbus Military and Tankers

Airbus Military, a business unit of Airbus is responsible for all military transport aircraft derivatives, including the Multi Role Tanker Transport (MRTT). Airbus is an EADS company.

Through various companies now part of EADS such as Aérospatiale, British Aerospace (Filton), CASA and EFW, Airbus Military builds on more than 35 years of experience in the development of tanker/transport solutions offering versatile, low risk, and cost-effective quality products.

2010 marks the 10th anniversary of the contract signature of the first MRTT derived from an Airbus platform: the conversion of four A310-300s into A310 MRTT for the German Air Force contracted on 15 December 2000. The four German A310 MRTTs and the two Canadian CC-150T Polaris are regularly involved in fighter deployments. troop rotations, medical evacuations and humanitarian/natural disaster relief operations all over the world.

The A330-200 - A Sound Basis

The A330 MRTT (Multi Role Tanker Transport) is based on the successful A330-200, a medium-to long range, twin aisle, twin engine, commercial aircraft of the Airbus family. Its design combines the proven flyby-wire control system and advanced avionics with the most up-to-date manufacturing techniques.

- Highly competitive economics
- Best value for money
- Constant product enhancement.



Over 1000 A330s were ordered by leading carriers around the world - including major airlines such as:

- Afriqiyah Airways
- · Air Algérie
- Air Canada
- Air Caraïbes
- Air Europa
- Air France
- Asiana Airlines
- Atlas Jet Airlines
- Delta Air Lines
- Egyptair
- Emirates

- Etihad Airways
- Finnair
- GECAS
- · Gulf Air
- · ILFC
- Jetstar Airways
- Jet Airways
- Kingfisher Airlines
- · KLM
- Korean Air
- Lufthansa

- Northwest Airlines
- · Oman Air
- Qantas
- Qatar Airways
- · SAS
- Singapore Airlines
- TAM
- · TAP
- Thai Airways
- Turkish Airlines
- · US Airways.



Airbus has delivered more than 700 A330s to over 80 different operators around the world.

The growing order backlog for the A330 and its four-engine A340 counterpart ensures sustained production of these aircraft for years to come, continuing upgrades and improvements, and guarantees a ready supply of competitively-priced spare parts.

More than 1000 A330s and A340s are flying today, backed by an international support network that responds to the needs of the world's most demanding operators.

The A330 MRTT can be equipped with a combination of any of the following systems:

- Aerial Refuelling Boom System (ARBS)
- Under-wing Refuelling Pods
- Fuselage Refuelling Unit (FRU).

The optional mix of boom and hose and drogue refuelling systems ensures that allied and NATO aircraft can be accommodated on the same mission without the need for tanker reconfiguration.

The A330 MRTT has flight proven and mature refuelling systems as more than 180 tonnes (397 000 lb) of fuel have been transferred to various receivers (F-16 Fighting Falcon, E-3 AWACS, KC-30A and F/A-18 Hornet) and more than 600 contacts have been made up to May 2010.

Interoperability with NATO and Allied countries

A Large Basic Fuel Capacity

The fuel is carried in six tanks each formed as an integral part of the standard A330-200 structure:

- · A tank in the wing centre section
- · An inner and outer tank in each wing
- · A trim tank in the horizontal stabilizer.

The 111 000 kg (245 000 lb) fuel capacity of the A330 MRTT enables the aircraft to perform its AAR Mission without any additional fuel tanks

Airbus Military Aerial Refuelling Boom System (ARBS)

- The ARBS is designed to refuel receptacle-equipped receivers such as the F-16 Fighting Falcon, F-35A
 Lighting II or the A330 MRTT itself (when equipped with an UARRSI)
- It is the only new generation boom system which allows the fastest fuel offload rate (4600 litres/min 1200 US gal/min), greatly reducing the refuelling operation time
- State-of-the-art technology for improved reliability giving higher availability
- All electrical Fly-by-Wire control system which is more accurate and responsive
- The design provides a geometrical envelope three times larger than that of the KC-135 facilitating safer contacts and refuelling operations
- Automatic load alleviation system and independent disconnect system for equipment protection and safer operation.





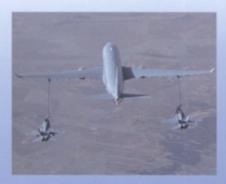
Main Characteristics:

- Fuel Flow Rate: 3600 kg/min (8000 lb/min) 4600 litres/min (1200 US gal)
- Nominal Pressure: 50 psig (345 kPa)
- Retracted Length: 11.60 m (38 ft)
- Extended Length: 18.20 m (60 ft)

State-of-the-Art Air-to-Air Refuelling Systems

Cobham 905E Under-wing Pods

- To refuel probe-equipped receivers such as the Eurofighter, F/A-18 Hornet or Sukhoi 30
- Certified simultaneous refuelling of 2 receivers at high fuel offload rate (1600 litres/min 420 US gal/min) which allow more time available for the mission of the receivers
- The 905E wing pods are made by Cobham, inventor of the hose and drogue refuelling system, the A330 MRTT benefits from the heritage and experience of 80 years of flight refuelling
- Digital control and electrically operated pods for an optimized reliability and maintainability
- Wide refuelling speed range (180-325 kt CAS) which enables the refuelling of many types and configurations of receivers.



Main Characteristics:

- Fuel Flow Rate: Up to 1300 kg/mir (2800 lb/min) 1600 litres/min (420 US gal/min)
- Nominal Pressure: 50 psig (345 kPa)
- Hose Length: 90 ft (27.4 m).



Cobham 805E Fuselage Refuelling Unit (FRU)

- Capability to refuel large aircraft with a nose probe such as the Airbus Military A400M
- Reliable and capable single point alternative to under-wing pods offering a permanent hose and drogue capability with negligible impact on aircraft performance
- Commonality of parts, control architecture and maintenance philosophy with the Cobham 905E under-wing pods.



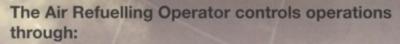
Main Characteristics:

- Fuel Flow Rate: 1800 kg/min
 (4000 lb/min)
 2300 litres/min
 (600 US gal/min)
- · Nominal Pressure: 50 psig (345 kPa)
- Hose Length: 90 ft (27.4 m).

Air Refuelling Console

The AAR systems are controlled from an advanced Air Refuelling Console that is positioned in the cockpit. A second seat at the console will facilitate training and observation, and can also double as a location for an optional mission system operator.

Operations of the boom (where installed) are more precise than current systems due to fly-by-wire controls and electrical actuators, and together with an enhanced video monitoring system, result in a much reduced operator workload.



Common Controls:

- . Three panoramic displays, providing views of behind and the sides of the
- · Communications Control Panel (CCP) and Multipurpose Control and Display Unit (MCDU)
- Multi-Function Control Display Unit (MFCD)
- · Oxygen mask.

Boom Controls:

- · A flight control stick to fly the boom
- A control stick which controls the extension /retraction of the telescope
- An advanced 2D/3D vision system
- · A pair of special glasses to view the 3D screen (another one for an instructor if needed). They are as light as normal spectacles.

Hose and Drogue Controls:

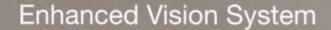
Wing pod/ Fuselage Refuelling Unit (FRU) panel.

Options:

- Laser pointers to aid final connection
- Mission planning system docking station and laptop
- Oxygen connector for Nuclear Biological and Chemical (NBC) equipment.







The A330 MRTT is equipped with an Enhanced Vision System (EVS), which ensures a complete view of the receiver aircraft in formation prior to, and during, refuelling operations. The cameras are located to provide images of the left/right/centre rear views and are controlled from the Air Refuelling Console.

Night missions are also possible using this video system, through infrared (IR) illumination, which provides a high degree of definition.

The EVS comprises the following sub-systems:

- Panoramic cameras
- Inspection cameras
- Digital video recording capability
- 2D/3D cameras (boom system only)
- · A set of laser pointers (boom system only).





Universal Aerial Refuelling Receptacle Slipway Installation (UARRSI)

The aircraft can be equipped with a Universal Aerial Refuelling Receptacle Slipway Installation (UARRSI), compatible with boom nozzles complying with US/ NATO standards.

The UARRSI allows the A330 MRTT to be refuelled from tankers equipped with a boom system with the following refuelling capabilities:

- Nominal: 2700 kg/min (6000 lb/min) 3400 litres/min (900 US gal)
- Optional: up to 3600 kg/min (8000 lb/min) 4600 litres/min (1200 US gal).

To perform night-time operations, the receptacle is illuminated and markings located around the refuelling receptacle are provided.



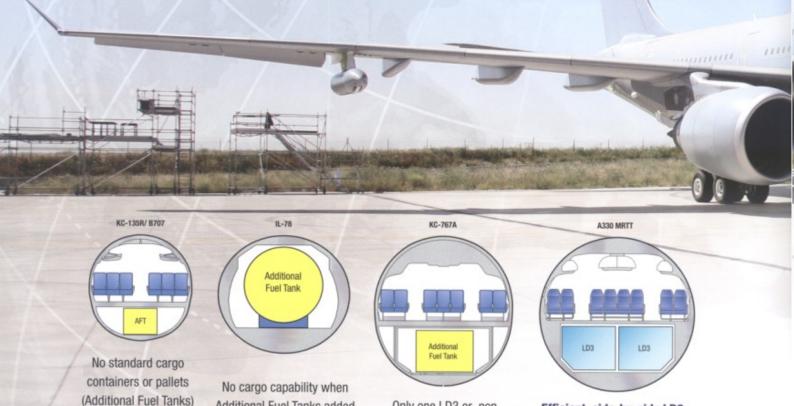


Widebody Fuselage

The A330 MRTT features the standard Airbus 222 in (5.63 m) cross-section. It is a true wide-body that provides optimum efficiency in the cabin and lower deck cargo compartments. The A330 wing is large enough to hold all the fuel needed to make the A330 MRTT a high performing tanker without impairing the fuselage capacity to carry passengers and/or cargo.

The cabin incorporates the following features:

- Choice of 4, 5, 6, 8, or 9-abreast seating
- Efficient side-by-side LD3 containers
- Full pallet capability including up to 8 full-size 463-L military pallets in the forward and aft cargo compartments.



Cabin Features

The A330 MRTT cabin is designed to ensure optimum seating configurations in every class, that maximise both capacity and comfort. The cabin can be configured in a large variety of layouts from 253 seats in a threeclass configuration, through 298 passengers in a two-class configuration, to 380 passengers in a single class configuration. The cabin is furnished with an attractively modern design. These features enable a complete range of configurations from maximized troop transport to complex customization suitable for VIP and guest missions.

Only one LD3 or non

standard containers (such as

Additional Fuel Tanks)

Efficient side-by-side LD3

containers and no AFTs

Additional Fuel Tanks added

An optional Crew Rest Compartment (CRC), located in the forward cabin can be installed for a spare crew in order to increase time available for a mission. The passenger cabin of the A330 MRTT can be provided with a set of removable airstairs to enable the crew and passengers to enter and leave the aircraft when airbridges or ground support equipment are not available.

Passenger Carrier and Medical Evacuation (Medevac)

Typical MRTT Cabins

Single-Class Configuration

- 291 passenger seats
- · Five galleys
- · Seven toilets.

Two-Class Configuration

- 270 passenger seats (30+240)
- Five galleys
- Seven toilets
- Integral airstairs
- Crew Rest Compartment



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The A330 MRTT can also be configured to perform Medical Evacuation (Medevac) missions. The large size of the fuselage permits maximum flexibility and ensures comfort to all patients, e.g. up to 130 standard stretchers can be carried.

Light Medevac Configuration

Medical beds can be installed over the top of designated fold down seats in any seating configuration. With this facility, the A330 MRTT can be used as a troop transport on an outbound relief mission, with medical beds stowed in the lower cargo compartments and be rapidly converted into a Medevac aircraft for the return journey.

Typical Medevac Configuration

- 40 NATO stretchers
- 20 passenger seats for medical staff
- 100 passenger seats
- 2 Medical beds.

Intensive Medevac Configuration

Optional critical care modules can be installed to provide a capability to evacuate seriously ill patients. The modules effectively replicate an intensive care facility in the air.

- Up to 28 NATO stretchers
- · Up to 6 critical care modules
- · 20 passenger seats for medical staff
- 100 passenger seats.



Maximised Medevac configuration (130 NATO stretchers)

Lower Deck Cargo Compartments

Like the A330-200, the A330 MRTT includes two lower deck cargo

- underfloor cargo containers and pallets
- No need for special containers
- · Air-to-air refuelling systems do not affect cargo compartment capacity





- compartment
- Four (88x108 inches) 463-L NATO military pallets in the lower deck forward cargo compartment
- Four (88x108 inches) 463-L NATO military pallets in the lower deck aft cargo compartment
- 1 LD3 container in the lower deck bulk cargo compartment.

Container Capacity

- 14 LD3 container in the lower deck forward cargo compartment
- 12 LD3 in the lower deck aft cargo compartment
- 1 LD3 container in the lower deck bulk cargo compartment.

The LD3 is the most widespread cargo container over 200 000 in worldwide use.



Cargo Transport

Optional Main Deck Cargo Compartment

The versatility of the A330 MRTT enables a large number of cargo options to be transported. From standard commercial containers and pallets through military, ISO and NATO pallets (including seats) and containers, to military vehicles and other large items of equipment which are loaded through a cargo door.

Full Freighter Configuration

- Up to 34 x 463-L military pallets
- 26 in the main deck cargo compartment
- 8 in the lower deck cargo compartments
- Available volume of 335 m³ or 11 800 ft³.

Palletized Seat Configuration

The A330 MRTT freighter version can also be converted into a passenger aircraft by installing 252 palletized passenger seats.

Combi Configuration

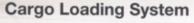
- 5 x 463-L military pallets
- 136 palletized seats.











- Containers and pallets can be moved by an optional electrically powered drive system at the door area and moved down the cabin and locked manually
- Drive systems and sill locking are controlled from external panels next to the doors
- Simultaneous loading of the forward and aft compartments is possible
- LD3 containers can be loaded in pairs.

Cargo Door

The A330 MRTT is designed to allow the installation of a large optional cargo door in the forward fuselage. 200 of these doors are already in service with cargo operators flying A300/A310s.

- 3.58 m (141 inches) wide and 2.56 m (101 inches) high
- Door is hydraulically operated and electrically controlled
- Door opening position: 70°.





State-of-the-Art Flight Deck

The flight deck is the most advanced in the tanker transport market today, providing high reliability and lower crew workload, enabling greater concentration on mission execution.

Eight large screens and two head-up displays (optional) provide comprehensive flight data which enable better crew situational awareness.



Two Onboard Information Terminals (OIT) provide awareness and other military data to the two pilots. Two side stick controllers give precise control to the fly-by wire system, which delivers improved and safer flight characteristics.

Fly-by-Wire

The A330 MRTT benefits from fully proven Airbus fly-by-wire flight control systems giving:

- Flight envelope protection
- More responsive flight controls
- Reduced pilot workload
- Auto flight system adapted to air-to-air missions.

Powerplant

Engines from three major manufacturers can be selected, offering the most modern high bypass ratio, low fuel burn, low noise and low emission technology.

- General Electric CF6-80E1A3/A4: at a nominal thrust of 72 000 lbf (320 kN)
- Pratt & Whitney PW4168A: at a nominal thrust of 68 000 lbf (302 kN)
- Rolls-Royce Trent 772B: at a nominal thrust of 71 000 lbf (316 kN).

Systems

Navigation

Full avionics suite designed to meet both civil and military standards: Air Data/Inertial Reference Units (ADIRU), Flight Management System (FMS), Navaids with automatic tuning, dual weather radar systems, radar altimeter, Global Positioning System, Enhanced-Ground Proximity Warning System (EGPWS), Tactical Air Navigation (TACAN), Air to Air TACAN (AIRTAC), Enhanced Traffic Collision Avoidance System (ETCAS), Optional Military GPS P/Y with antijamming capability and FMS military functions.

Mission Management System

The optional military mission management system is composed of three main subsystems:

- MPS (Mission Planning System)
- AMIS (Aircraft Mission and Information System)
- MIDS (Multifunctional Information Distribution System)/Link 16.

Communications

The A330 MRTT is equipped with a complete communications suite, designed to meet both civil and military communications standards. The communication management system integrates the following items: HF, V/UHF, VHF/Dataradio, SATCOM/optional military satellite communication, COMSEC system (optional), optional Tactical data link (e.g. Link 16), optional IFF (Identification Friend or Foe) system, DF System, Secure Communications Control System (SCCS) and radio relays (optional).



- Self-Protection systems such as LAIRCM (Large Aircraft Infra Red Counter Measures), a fully autonomous system that provides protection against infrared-guided missiles using MWS (Missile Warning System) cues; or RWR (Radar Warning Receiver) and CMDS (Counter-Measures Dispenser System)
- Armouring including cockpit and critical systems protection against fire arm threats
- Fuel Tank Inerting system protecting against explosion and fire in the event of impacts.

Competitions and Customers

- Six A330 MRTTs ordered by the Royal Saudi Air Force
- The AirTanker consortium ordered fourteen A330 FSTAs (Future Strategic Tanker Aircraft) to supply the UK's





5 x KC-30A MRTTs

Saudi Arabia



6 x A330 MRTTs

United Arab Emirates



3 x A330 MRTTs

United Kingdom



14 x A330 FSTAs

Customer Services

More than 35 years of great worldwide success offering services tailored to the customer. The 800 aircraft delivered have the support of Airbus Military Customer Services, which offers personalised assistance to meet all the needs of each operator.

Airbus Military applies the Integrated Logistic Support (ILS) concept throughout the life cycle of its products, from the first design phase right through to the end of their useful lifetimes.

The main objective of Airbus Military is to ensure that clients obtain the best operational results and benefit from an integrated support service in accordance with their needs, thus guaranteeing the success of their missions.

Airbus Military offers a comprehensive range of services to meet demanding expectations from modern air forces:

- Integrated services solutions
- Customer support
- Training and operation services
- MRO, Maintenance engineering and fleet management services

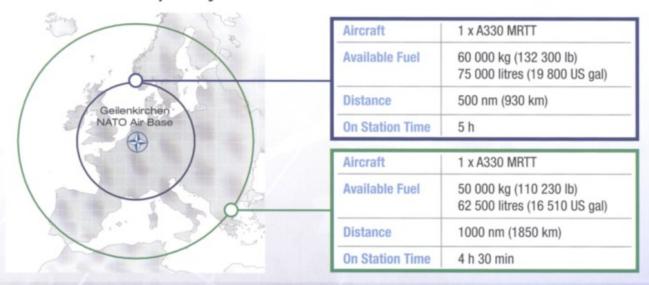




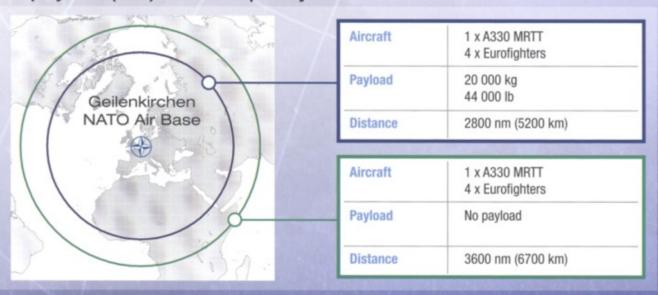
Training centre for the Royal Australian Air Force KC-30A MRTT crews located in Amberley.

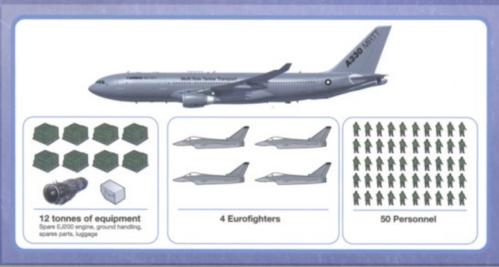
Air-to-Air Refuelling Performance

Towline Mission Capability



Deployment (Trail) Mission Capability





ONE A330 MRTT can deploy 4 fighters and airlift all the necessary support equipment and personnel over 2800 nm.

Air Transport Performance

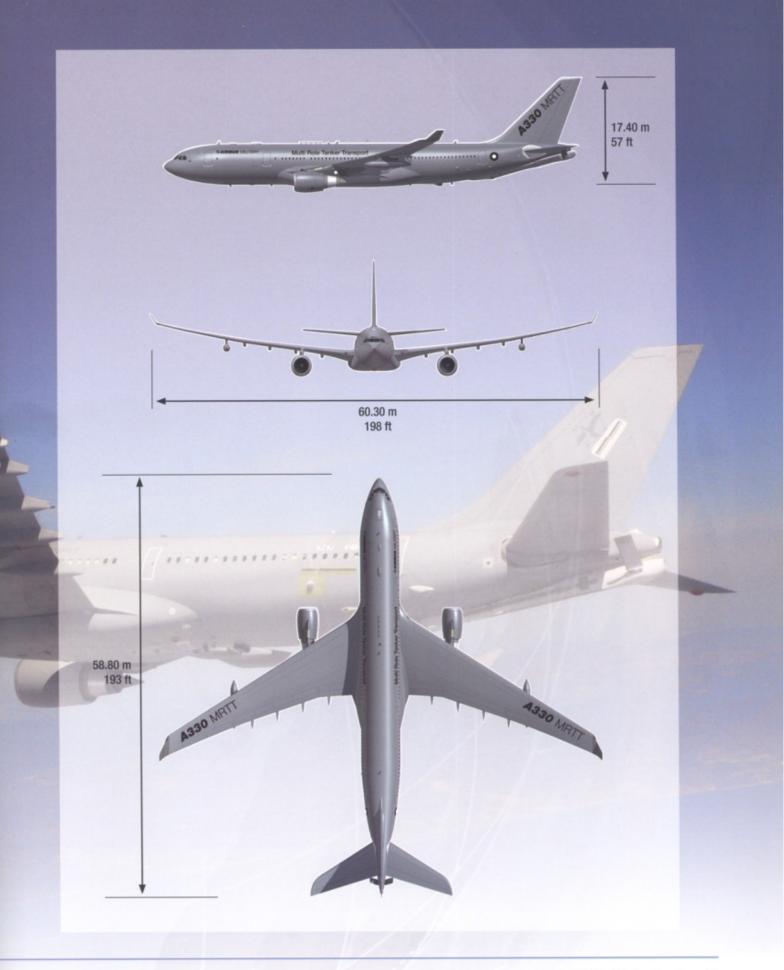
Strategic Transport Mission Capability*



Specifications

General Dimensions		
Overall Length	58.80 m	193 ft
Overall Height	17.40 m	57 ft
Wing Span	60.30 m	198 ft
Wing Area	362 m ²	3900 ft ²
Maximum Weights		
Maximum Taxi Weight (structural) MTW	233 900 kg	516 000 lb
Maximum Take-Off Weight (structural) MTOW	233 000 kg	514 000 lb
Maximum Landing Weight (structural) MLW	182 000 kg	400 000 lb
Maximum Zero Fuel Weight (structural) MZFW	170 000 kg	375 000 lb
Maximum Fuel Weight MFW	111 000 kg	245 000 lb
Maximum Payload	45 000 kg	99 000 lb
Engine		
General Electric CF6-80E1A3	72 000 lbf	320 kN
Pratt and Whitney PW 4168A	68 000 lbf	302 kN
Rolls-Royce Trent 772B	71 000 lbf	316 kN
		and the same of the same
Performance		
Maximum Cruise Altitude at MTOW	41 500 ft	12 600 m
Maximum Operating Altitude - AAR Mission	35 000 ft	10 700 m
Maximum Cruise Speed	Mach 0.86	550 kt
Typical Cruise Speed	Mach 0.82	530 kt
Maximum Diving Speed	Mach 0.93	600 kt
Refuelling Envelope	180-325 kt CAS 330-600 km/h	
	The second	
Range		
Range with Maximum Payload (ISA+15)	3800 nm	7000 km
Range with 40 Tonnes Payload (ISA+15)	4500 nm	8400 km
Range with 30 Tonnes Payload (ISA+15)	5500 nm	10 200 km
Range with 20 Tonnes Payload (ISA+15)	6500 nm	12 000 km
Range with 10 Tonnes Payload (ISA+15)	7500 nm	13 900 km
Ferry Range/ Range with Maximum Fuel (ISA+15)	8000 nm	14 800 km
Take-off and Landing Performance		
Landing Distance - LFL-SL MLW	1750 m	5700 ft
Landing Distance - LFL - 2000 ft, MLW	1800 m	6000 ft
Take-off Distance - SL, ISA, MTOW	2800 m	9200 ft
Take-off Distance - 2000 ft, ISA, MTOW	3000 m	10 000 ft
Crew		
2000 102	2	
Flight Crew	_	
Flight Crew Mission Crew		ng Operator and 1 Mission

Dimensions



A330 MRTT The Benchmark





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> Reference: AMCM0118/04/2010 AIRBUS IS AN EADS COMPANY

More information on the A330 MRTT official web site: www.a330mrtt.com

