DEFENCE AND SPACE
Air Power

A400M

The 21st Century Airlifter

AIRBUS

A400M
The 21st Century Airlifter

Contents

The A400M is a **unique aircraft** offering **game-changing capabilities** that enable the delivery of heavy-lift helicopters or 32-tonne infantry fighting vehicles more quickly to more remote or **desolate regions.**

UNIQUELY **ADAPTABLE**

Current and future operations require both strategic and tactical capabilities but shrinking defence budgets mean air forces can no longer afford to support separate types of aircraft.

These new requirements are effectively met by the operational characteristics of the A400M:

STRATEGIC LIFT

- Large cargo hold and payload
- Long range
- High speed and high altitude

TACTICAL DELIVERY

- Aerial delivery of paratroops and cargo
- Short and soft unpaved airstrip performance
- Autonomous ground operations
- Casualty Evacuation (CASEVAC)/Medical Evacuation (MEDEVAC)
- Hostile environment operations

FRONT-LINE TANKING

- 2 or 3 point refuelling system
- Wide altitude and speed flight envelope

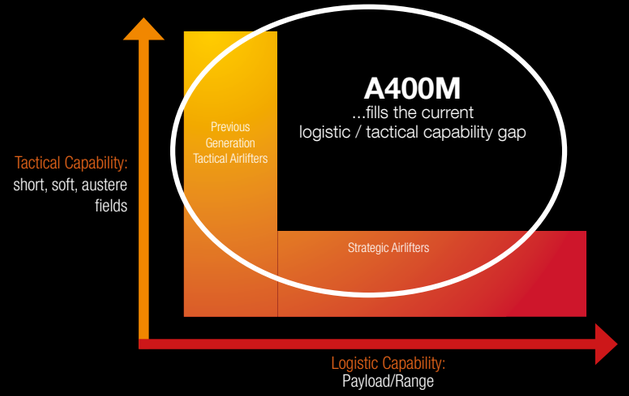
STRATEGIC LIFT, **TACTICAL** DELIVERY, FRONT-LINE **TANKING**

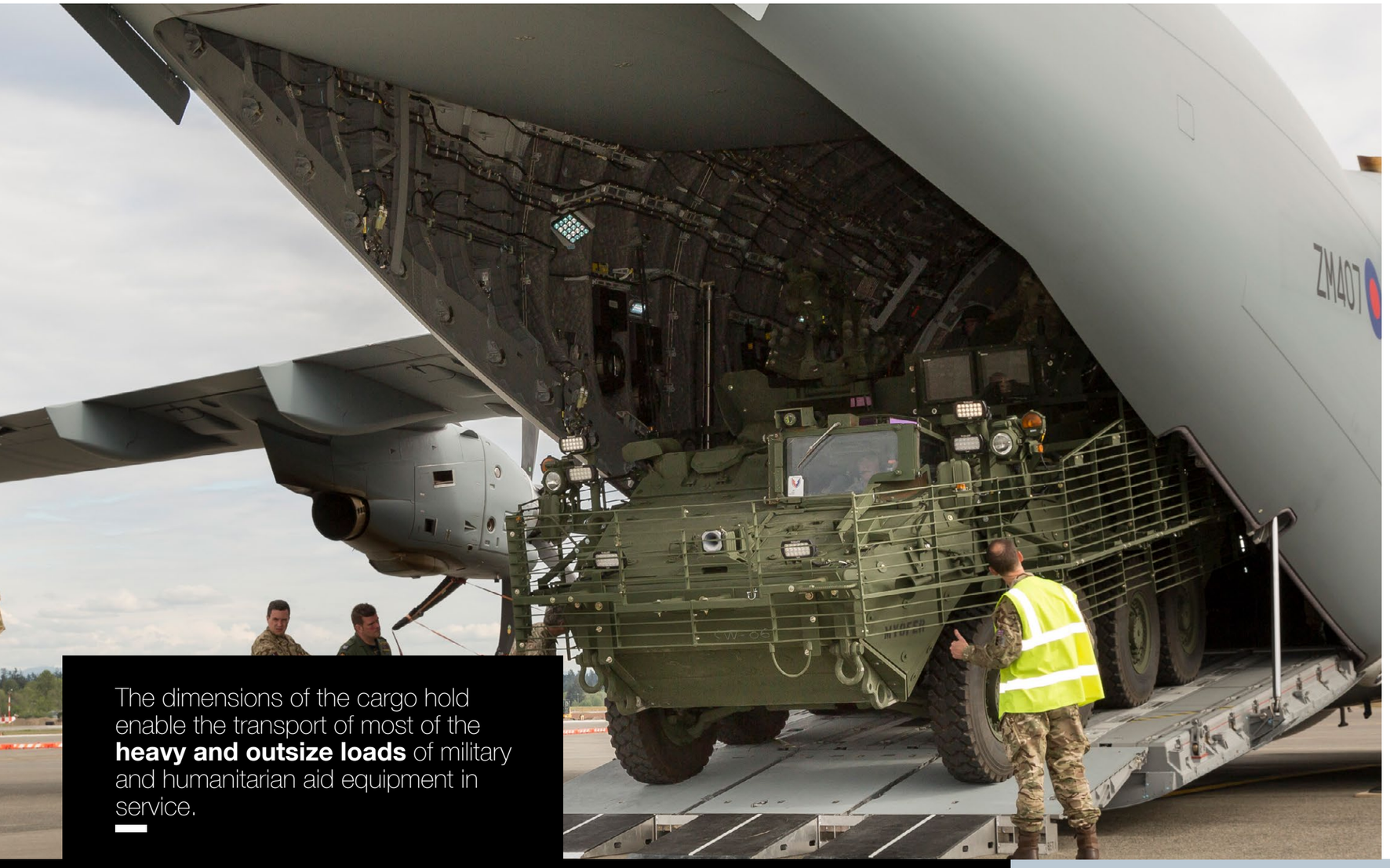
The A400M is equipped to deliver its heavy payload almost anywhere - thanks to its ability to land on short unpaved airstrips in the theatre of operations or close to a natural disaster area.

With its ability to fly far, fast and at high altitude – the world's most versatile airlifter can help make every mission a success - be it aerial delivery, paratrooping or air-to-air refuelling.

Current strategic aircraft are good outsize-load airlifters but are costly and have limited tactical capability as they cannot operate from soft fields.

The A400M is a larger, more modern, truly versatile aircraft specifically designed for today's requirements and those of the future. Thanks to its good tactical performance and the ability to carry outsize loads over long distances, the A400M fills the current logistic and tactical gap.





The dimensions of the cargo hold enable the transport of most of the **heavy and outsize loads** of military and humanitarian aid equipment in service.

STRATEGIC LIFT

With a maximum payload of up to 37 tonnes (81 600 lb) and a volume of 340 m^3 (12 000 ft^3), the A400M can carry heavy engineering equipment, armoured vehicles, and outsize loads such as helicopters that are too heavy or too large for previous generation tactical airlifters over long distances.

The A400M therefore satisfies the fundamental contemporary requirements to airlift heavy and large equipment directly to where they are most urgently needed; thus enabling cost-effective and rapid response to crisis.

MILITARY

- 9 military pallets
- 116 troops/paratroops
- 24 CDS containers
- Two combat helicopters
- Two armoured vehicles
- One heavy infantry fighting vehicle
- One missile battery
- One heavy lift helicopter

HUMANITARIAN

- Two excavators
- One mobile crane
- One dump truck
- Medical and Casualty Evacuation (MEDEVAC/ CASEVAC), up to 66 standard NATO stretchers and 25 medical personnel

CIVILIAN CONTAINERISED CARGO

- 7 civil pallets
- 10, 20 ft, 30 ft and 40 ft ISO containers
- Palletised commercial seats, up to 110 economy-class seats (civil standard)

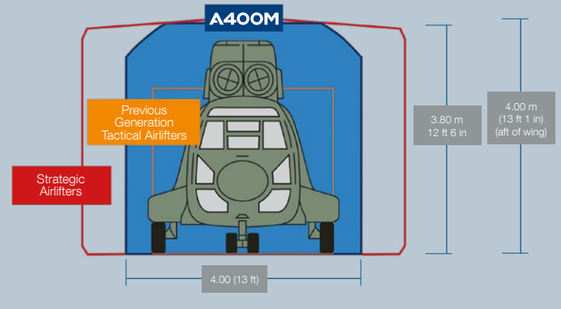
MIXED TRANSPORT OF CARGO AND TROOPS

- 54 foldable sidewall seats permanently installed
- 9 military pallets and 54 troops

LARGE CARGO HOLD AND PAYLOAD

The dimensions of the Cargo Hold allow transportation of a whole range of loads such as:

- Armoured vehicles and other heavy equipment used by Rapid Reaction Forces
- Specialised civil engineering equipment needed in some Humanitarian Assistance scenarios, such as cranes, excavators or large trucks
- Heavy-lift helicopters such as the Super Puma or NH90



TACTICAL DELIVERY

The A400M is designed to operate from austere airfields, with unpaved and/or short runways, limited space for parking or manoeuvring and no ground handling facilities, conditions that present severe constraints for other tactical airlifters.

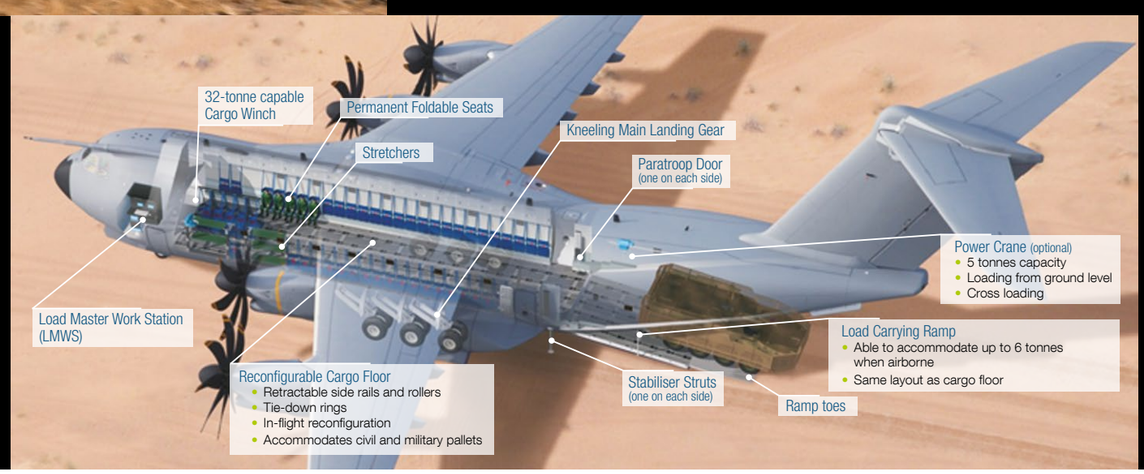
Its turboprop engines provide better protection against foreign object damages (FOD) than jet engines and its 12-wheel main landing gear allows greater weight distribution; thus enabling the delivery of bulky, heavy protected mobility vehicles and humanitarian relief more quickly to more remote or desolate regions which are inaccessible to any jet-engined aircraft.

As proven in modern day operations like in the Sahel Saharan region, the ability to use austere airfields close to the point of need within the theatre of operations avoids lengthy ground convoys that can be subject to ambush and IED (Improvised Explosive Devices) threat; this allows intermediate airports, usually congested during times of crisis, to be bypassed, therefore saving precious time in the delivery of equipment and troops.

The A400M can fly over 2200 nm **to deliver a payload of 25 tonnes (55 000 lb) into a 2500 ft (750 m) grass/soft sand airstrip (low CBR)**, with enough fuel on board to fly another 500 nm (930 km) to refuel.

AUTONOMOUS GROUND OPERATIONS

The autonomous capability of the A400M enables operations from remote austere airstrips. By minimising time on the ground, the A400M systems reduce the aircraft's vulnerability to hostile action. The Load Master Work Station (LMWS) enables full management of the Cargo Handling System and monitoring of aerial delivery operations. The Cargo Handling System allows for pallets and containers to be loaded/unloaded by a single loadmaster without assistance from ground staff.



Any A400M can be rapidly reconfigured to become a tactical tanker in less than two hours and it is able to refuel probe-equipped receivers at their preferred speeds and altitudes. **No other tactical tanker in service can achieve this.**

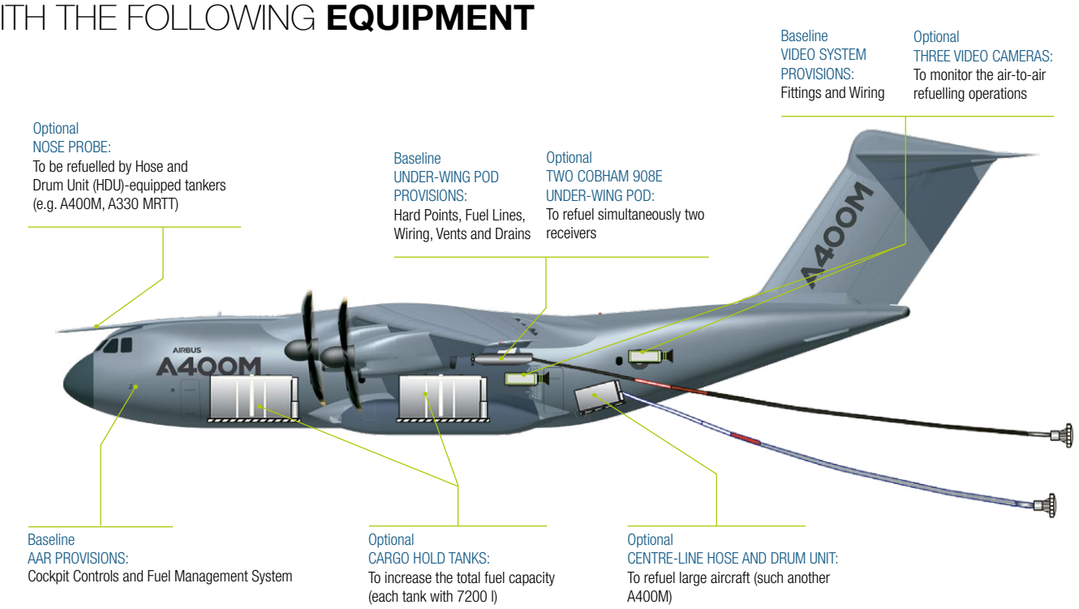
FRONT-LINE **TANKING**

Designed from the outset to be a dual-role transport and tanker aircraft, the A400M provides air forces with a cost-effective way of acquiring an Air-to-Air (AAR) refuelling capability in addition to a versatile strategic and tactical airlifter.

To enable AAR, the standard A400M has much of the equipment and software provisions already installed.

A modular approach is adopted whereby the operators have the option to adapt their aircraft accordingly. These provisions make it possible to convert rapidly the A400M transport aircraft to a tanker.

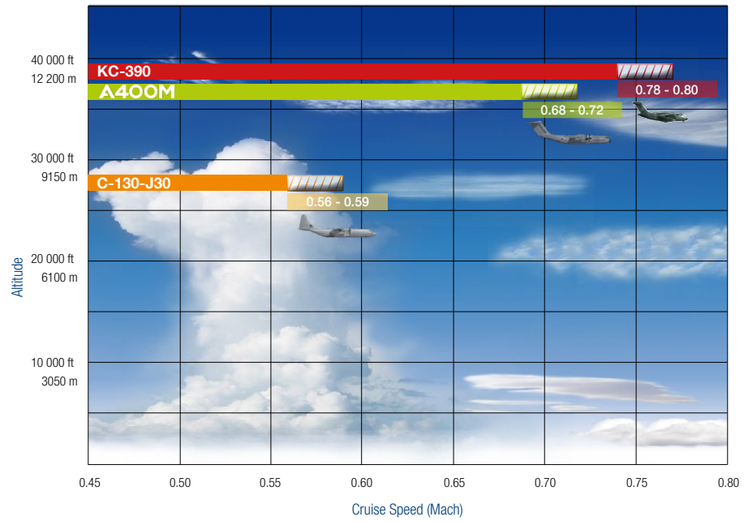
TO PERFORM AAR, THE STANDARD A400M AIRCRAFT CAN BE **QUICKLY FITTED** WITH THE FOLLOWING **EQUIPMENT**



The A400M is optimised to provide **the best cruise performance** combining with the best tactical capabilities, achieving cruising speeds of up to Mach 0.72 at 37 000 ft.

A **TURBOPROP AIRCRAFT** WITH **TURBOFAN PERFORMANCE**

The A400M provides a new standard of performance for tactical airlifters, and offers global reach at high speed, whilst still retaining the capability of landing at austere airfields.



"DOWN BETWEEN THE ENGINES" **COUNTER-ROTATION**

- Produces a more symmetrical airflow over the wing, which improves lift, aircraft handling and stability, as well as allows a reduction in the structural weight of the wing.
- Reduces the adverse yaw in case of an engine failure and gives a 4% increase in the lift at low speed.

A turboprop aircraft with turbofan performance

- High speeds
- High altitudes
- Wide refuelling speed range

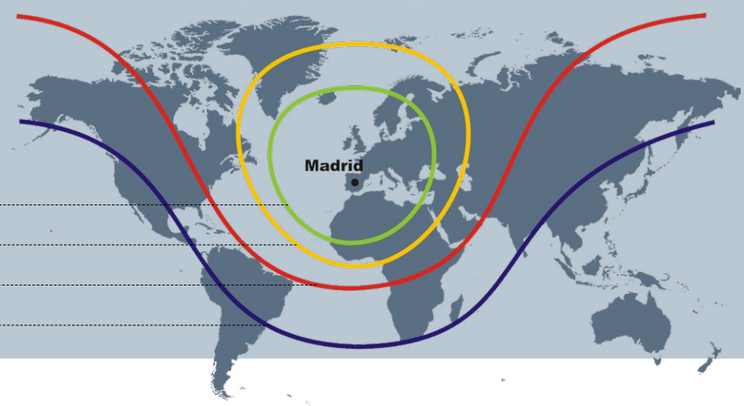
Full tactical capabilities enabled by turboprops

- Unpaved airstrip operations
- High rates of descent
- Low speed for airdrop
- Take-off and landing from hot and high airfields
- Lower fuel consumption

Performance to conduct long-range strategic missions

- More sorties per day
- Faster response to emergency situations
- Reduced troops and aircrew fatigue

37 t (81 600 lb)	1780 nm (3300 km)
30 t (66 000 lb)	2400 nm (4450 km)
20 t (44 000 lb)	3400 nm (6300 km)
Ferry range	4800 nm (8900 km)



As a versatile, multi-role airlifter, the A400M is capable of the **aerial delivery of loads, paratroops,** or combinations of both.

SUPERIOR AERIAL **DELIVERY**

The Aerial Delivery System (ADS) can use gravity extraction modes, with the cargo being rolled out by gravity induced by a nose-up attitude of the aircraft, and parachute extraction modes, with the cargo being pulled out of the cargo hold by a parachute. Such operations can be supported by the Computed Air Release Point (CARP) capability of the aircraft, which automatically computes the release point for optimum delivery accuracy.

HIGH ALTITUDE AERIAL DELIVERY

- High-level airdrop at up to 40 000 ft (12 200 m) is facilitated by rapid depressurization system to drop Special Forces

STANDARD AERIAL DELIVERY

Gravity extraction:
- Single cargo load up to 4 tonnes (8800 lb)
- Up to twenty-four 1 tonne (2200 lb) containers
- Multiple loads with a combined weight of up to 25 tonnes (55 000 lb)

Parachute extraction:
- Single cargo load up to 16 tonnes (35 300 lb)
- Multiple loads with a combined weight of up to 25 tonnes (55 000 lb)

Mixed aerial delivery of loads and paratroops:
- Ramp Aerial delivery System (RAS)/Wedge - loads of up to 4 tonnes (8800 lb)
- 320 kg (705 lb) bundle loads through the lateral doors and 116 paratroops

COMBAT OFFLOAD

The combat offload procedure allows very quick off-loading of pallets on the ground.

With the ramp in the horizontal position, the Cargo Handling System locks are released; full power is then applied and the wheel brakes released: as the aircraft accelerates, the pallets roll out through the ramp onto the ground.

HOSTILE ENVIRONMENT OPERATIONS

The A400M has been specifically designed for low detectability, low vulnerability and high survivability giving the aircraft excellent self-protection

LOW DETECTABILITY: HARD TO FIND

- Enhanced low-level flight capability
- Cockpit fully Night Vision Goggles (NVG) compatible
- “Clean” engines: no exhaust smoke trails
- Controlled electronic emissions
- Highly manoeuvrable: fly-by-wire controls for optimum handling

LOW VULNERABILITY: HARD TO HIT

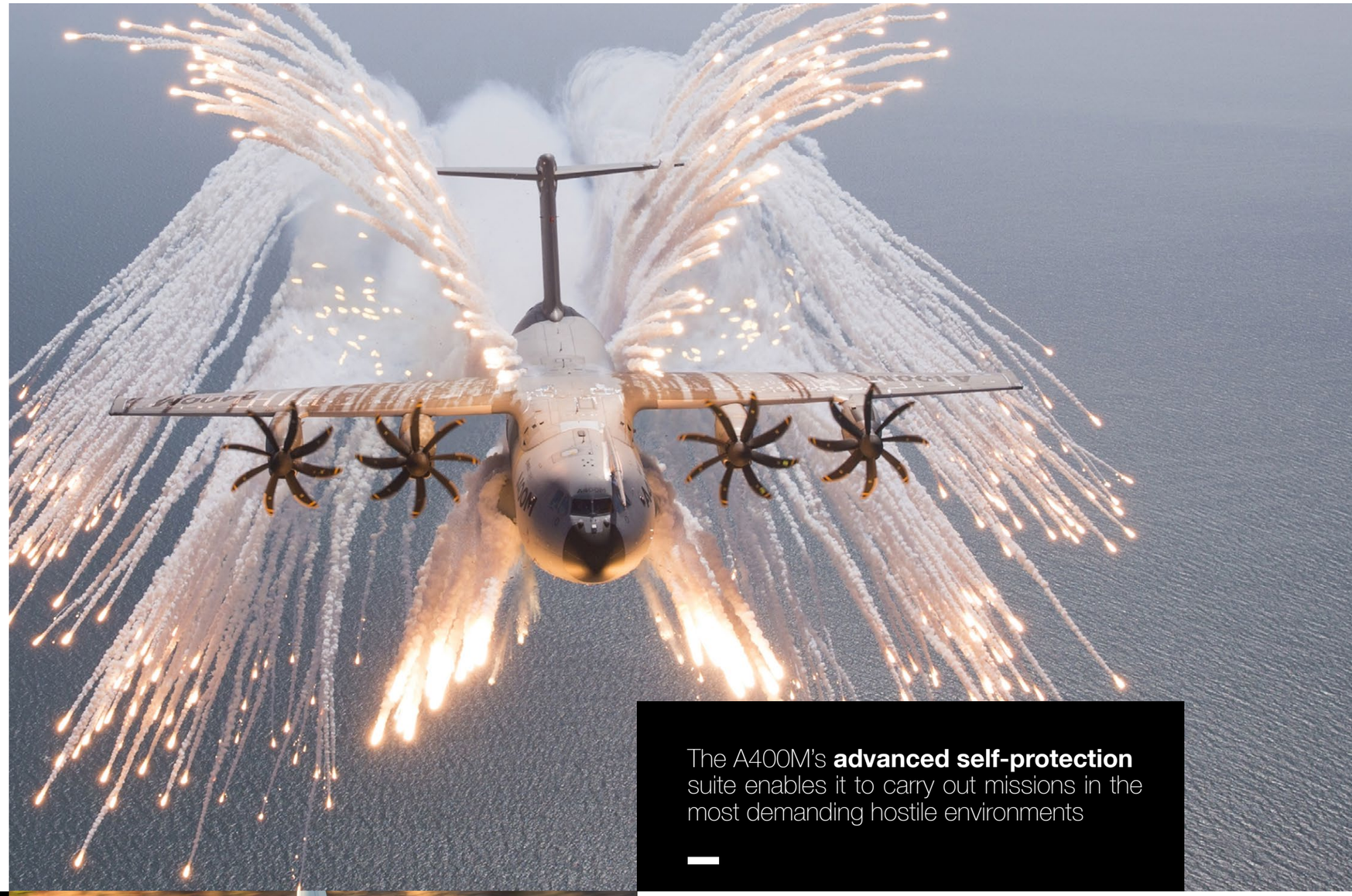
- Engines designed to minimise Infra-Red signature
- Fly-by-wire for optimum aircraft manoeuvrability with bank angles increased to 120°
- Steep angles of descent and approach
- Modular Defensive Aids Sub-Systems (DASS):
  - Missile Warning System-Passive element (MWS-P)
  - Radar Warning Receiver (RWR)
  - Expendables Dispensing System (EDS)
- Defensive Aids Computer (DAC)
  - Programmable
  - Fully automatic mode

HIGH SURVIVABILITY: HARD TO KILL

- Damage-tolerant design of airframe and systems
- Four independent computers for fly-by-wire
- On-Board Inert Gas Generating System (OBIGGS)

To protect the crew (cockpit and LMWS) against 12.7 mm armoured piercing ammunition:

- Armouring Kit
- Armoured Cockpit Windscreens and Side Windows



The A400M’s **advanced self-protection** suite enables it to carry out missions in the most demanding hostile environments

LOW LEVEL FLIGHT

The A400M is capable of performing tactical missions at very low level to take advantage of terrain masking, avoiding an exposure to enemy threats, resulting in improved survivability.

The Low Level Flight is possible in manual handling mode (150/300 ft above ground level in VMC (Visual Meteorogical Conditions) day/VMC night conditions).

The A400M is the very first airlifter able to fly automatically in Instrument Meteorological Conditions (IMC) 500 ft above ground level with the military GPS (Autopilot or Flight Director engaged).

Based on the Airbus A380 cockpit with additional features, the A400M glass cockpit is **designed to reduce pilot workload and fatigue** for a two-person crew.

UNIQUE SITUATIONAL **AWARENESS**

The A400M has a complete suite of essential aids providing an enhanced situational awareness compared to conventional military transport aircraft:

- Head-Up Displays (HUD)
- Enhanced Vision System (EVS)/FLIR sensor
- Tactical Terrain Awareness Display (T-TAD)
- Military Radar with enhanced ground mapping functions
- Electronic Centralized Aircraft Monitoring (ECAM)
- Optional 3rd Flight Crew Member Seat and Workstation

Fly-by-Wire optimised for Military Operations

- Two independent Fly-by-Wire control systems give excellent handling qualities - such as “direct lift control” for easier air-to-air refuelling manoeuvres
- Expanded flight envelope protection such as safe manoeuvring up to 120° in roll, with no limit in pitch, and with roll rates up to 35° per second

COCKPIT DESIGNED TO REDUCE WORKLOAD

The full glass cockpit is composed of large and interactive displays controlled through cursor device and keyboard.

- Automated CG (Center of Gravity) calculation
- Simple EMCON (Emission Control) switching
- Simplified switching, uncluttered screens
- Automated Tanker and Receiver fuel control
- Auto Fuel Tank Inerting

TP400-D6 THE MOST POWERFUL TURBOPROP ENGINE IN PRODUCTION

- All new 3-shaft Turboprop Engine in the class of 11 000 shp (8200 kW)
- Sophisticated FADEC (Full Authority Digital Engine Control) optimising power-plant efficiency and greatly reducing pilot workload
- 8-bladed propeller having a carbon spar and a composite shell with a polyurethane coating

CUSTOMERS

The A400M has been designed to answer the wide-ranging requirements of ten different European and Asian air forces. Indeed, to replace their C160 Transall and C-130 Hercules fleets, seven NATO countries plus Malaysia, Kazakhstan and Indonesia have signed for 178 A400M firm orders. The first years of delivery are the following:

TAILORED SERVICE **SUPPORT**

A complete portfolio of continuous support elements delivered with the objective to guarantee the higher availability of the A400M fleet.

The Airbus service support model concerns several multidisciplinary aspects covering:

- Material services
- System support services
- Training services
- Flight operations services
- Advanced and tactical training and mission support
- Digital services and SmartForce
- Performance based services

TAILORED SUPPORT, **FROM ORGANIC SERVICES** TO **EXTENSIVE PERFORMANCE-BASED SOLUTIONS AS THE DCARE**

The Airbus Service model offers comprehensive support for a smooth Entry into Service (EIS) of the aircraft. It consists of an initial Integrated Logistic Support (ILS) package which contains the following basic support elements:

- Ground support equipment (GSE)
- Flight operations and Maintenance tools
- Technical Publications
- Initial training
- Initial spares provisioning

Then, from the time that the aircraft is delivered, Airbus can offer a tailored In-Service Support (ISS) solution to meet customer requirements:

FROM Organic services: consisting of a customized EIS baseline part (including Material support, Maintenance Support, Flight Operations support and Technical support), with a by-event specific services part (Training, MRO –maintenance, repair & overhaul-, material, IT support)

TO integrated performance services: consisting of two possible modular solutions denominated as DCare:

- Material availability (DCare Materiel) or

- Fleet availability (DCare Fleet)

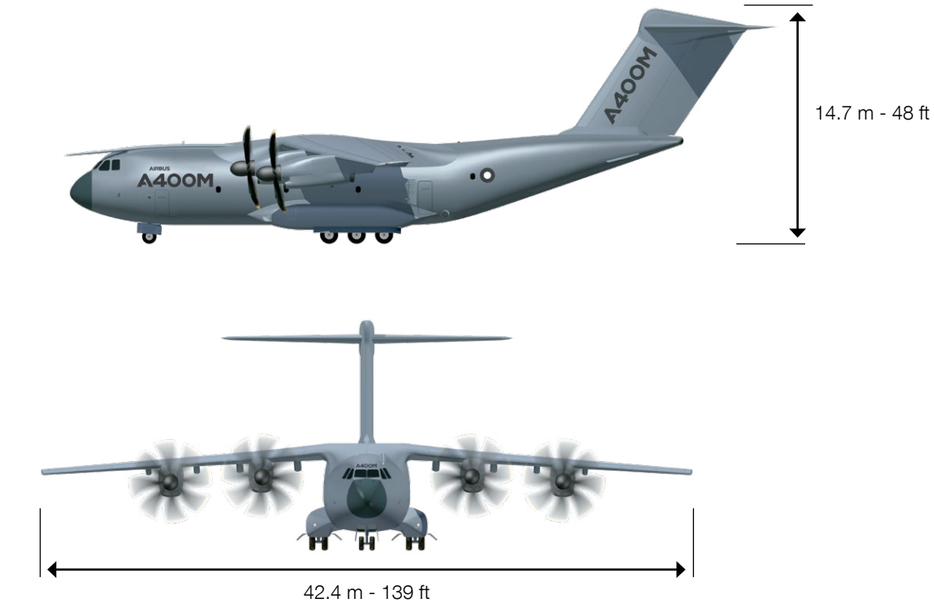
In both cases, the performance is recorded and measured through an appropiated KPI and could entail a fixed hourly rate scheme.

The models represent a stepped approach in terms of the commitment taken by Airbus DS. It starts from the Organic Services to DCare Materiel and to DCare Fleet, in which every step is based on the previous one (e.g. DCare Fleet would be based on the DCare Materiel coverage).

Some of the solutions offered have been already customized to existing A400M operators benefiting from a common central services operation.

SPECIFICATIONS AND DIMENSIONS

Dimensions		
Overall length	45.10 m	148 ft
Overall height	14.70 m	48 ft
Wing span	42.40 m	139 ft
Cargo hold length (ramp excluded)	17.70 m	58 ft
Cargo hold height	3.85 - 4.00 m	12 ft 8 in - 13 ft 1 in
Cargo hold volume	340 m^3	12 000 ft^3
Weights		
Maximum Take Off Weight	141 000 kg	310 850 lb
Maximum Landing Weight	123 000 kg	271 200 lb
Maximum payload	37 000 kg	81 600 lb
Internal fuel weight (density 0.8 kg/l)	50 800 kg	112 000 lb
Engine		
EuroProp international TP400-D6	11 000 shp	8200 kw
Performance		
Maximum operating altitude	40 000 ft	12 200 m
Maximum cruise speed (TAS)	433 kt	802 km/h
Maximum cruise speed (CAS)	300 kt	556 km/h
Cruise Speed	0.68 - 0.72 M	
Range		
Range with maximum payload	1780 nm	3300 km
Range with 30 tonnes payload	2400 nm	4450 km
Range with 20 tonnes payload	3400 nm	6300 km
Ferry range	4800 nm	8900 km

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