

AW101 Multi-Role Maritime Helicopter



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TOTAL MULTI-ROLE FLEXIBILITY

NEW CONCEPT

The AW101 is the latest variant of the EH101 helicopter. The EH101 was designed for military, maritime and civil roles. Its design and development was fully supported by an extensive program of government and industry funded research into the future requirements for medium lift helicopters. Designed, developed and produced by AgustaWestland, the AW101 has been in operational service since 1999.

This brochure describes the maritime utility variant of the AW101, which features new higher power engines and new generation main rotor blades for enhanced hot and high performance, and new cockpit displays for reduced pilot workload and increased mission effectiveness.

FLEXIBLE AND COST-EFFECTIVE

The AW101 provides the flexibility and cost-effectiveness demanded by its customers through:

- New Technology
- Large Capacity and Long Range
- High Safety Levels
- Superior Performance
- Total Product Support

MULTI-ROLE DESIGN

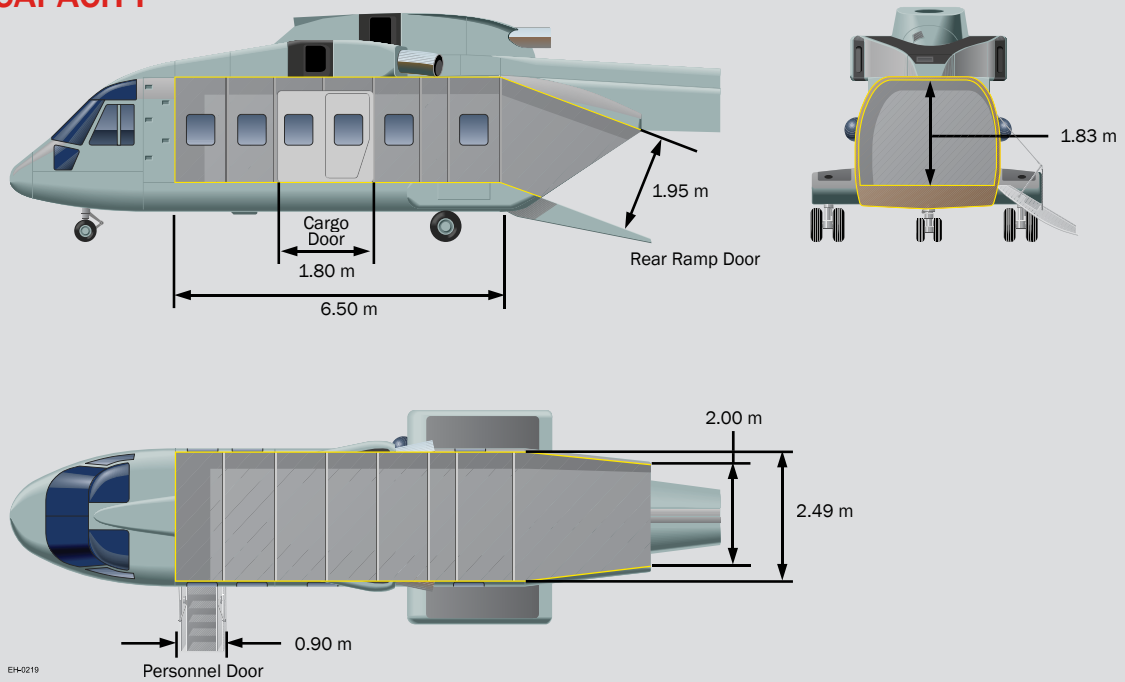
Based on a common airframe and core systems, the AW101 is configured to meet the diverse multi-role requirements of demanding maritime operations around the world.



ALL WEATHER CAPABILITY

- The AW101 is designed to operate from ships in extreme weather conditions.
- All weather operational capability from arctic (-45°C) to tropical/desert (+50°C) conditions
- De-icing system enables flight in known icing conditions
- 40 knot crosswind hover capability
- Rotor design reduces "brown-out" effect

LARGE CAPACITY



CABIN ACCESS

- Large starboard sliding cabin/rescue door (1.8 m x 1.55 m) allows easy access for equipment and CSAR operations
- Port sliding or airstair door (0.90 m x 1.70 m)
- Rear ramp opening (2.25 m x 1.95 m) for loading cargo, passengers and vehicles

CABIN CAPACITY

- Standard cabin capacity - 27 fully equipped troops or 30 passengers
- High density cabin capacity - 40 troops or passengers

VOLUME

- Cabin volume excluding the ramp area is 28 m³
- Ramp area adds 2.66 m³

FLOOR AREA

- 15 m² flat usable cabin floor area
- Modular role equipment for greater flexibility and speedy reconfiguration

MULTI-ROLE CAPABILITY

UTILITY

The AW101 has a range of over 750 nm (1390 km) and a cabin capable of carrying up to 40 troops or over 5 tons of cargo and equipment. With the largest capacity cabin in its class, the AW101 offers greater mission flexibility. With up to five under-floor fuel tanks, the AW101 can perform long range missions without additional ferry fuel tanks in the cabin.

AIRBORNE RE-SUPPLY / VERTICAL REPLENISHMENT

- 1.80 m x 1.55 m cabin cargo door and 2.25 m x 1.95 m rear ramp allow internal carriage of F-18 and F-35 engine modules and multiple bulk contain
- Optional cabin cargo winch, heavy duty floor and roller conveyors allow easy handling of heavy loads
- Two cargo hook installations are available with load capacities of 3000 kg or 4536 kg



AIRBORNE MINE COUNTERMEASURES

- Capacity to tow current and future AMCM equipment
- Long mission endurance ideal for mine hunting, neutralization and sweeping missions
- The AW101 cabin is compatible with current and planned AMCM systems
- Large rear ramp allows easy deployment of sensors
- Safe recovery from engine failure while towing

PERSONNEL / TROOP TRANSPORT

- Crashworthy cabin seats for fully equipped troops
- Easy access via cabin doors and rear ramp allow rapid loading and unloading
- Large floor area for mixed loads

MULTI-ROLE CAPABILITY

ANTI SURFACE WARFARE (ASuW)

- Fully integrated mission system
- Powerful 360° radar
- Optional FLIR for passive identification of contacts
- EW Suite
- Weapon stations for two long range anti-ship missiles

ANTI SUBMARINE WARFARE (ASW)

- Fully autonomous operating capability with onboard mission data processing
- Tactical two way datalink
- Fully integrated ASW mission system with dipping sonar and sonobuoys
- Weapon carriers for four torpedoes or depth charges

AIRBORNE EARLY WARNING (AEW)

- Enhanced 360° air surveillance radar for long range AEW
- Over five hours time on station
- Twin engine cruise capability for increased endurance
- Integrated mission system with tactical two-way datalink



MULTI-ROLE CAPABILITY

COMBAT SAR / SPECIAL FORCES / CASUALTY EVACUATION

- Large cabin allows carriage of tactical vehicles, bikes and boats internally with troops and equipment
- High power reserves and agility make the AW101 the ideal tactical helicopter
- 'Nap of Earth' flying
- Long range operations with standard fuel
- Optional Aircraft Survivability Equipment (ASE) and guns for operations in high threat environments
- Low noise signature
- Environmentally controlled and low vibration cabin can accommodate 16 stretchers and 4 medical attendants
- Extensive medical suite at each litter station provides advanced life support capability
- 1.83 m cabin height allows medical teams to work and move around the cabin with ease
- Easy access to the cabin is provided by a large cabin door or the rear ramp

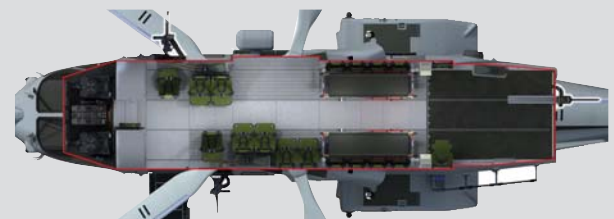
ROLE EQUIPMENT

The AW101 can be equipped with a wide range of mission and role equipment including:

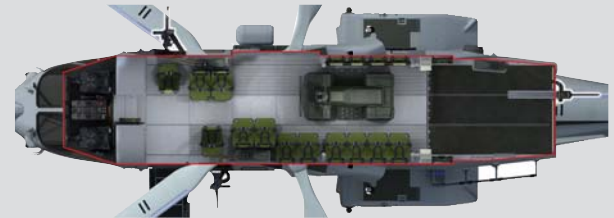
- Air-to-air refuelling probe
- Auxiliary fuel tank
- Aircraft Survivability Equipment
- Medical Suite
- Cabin cargo winch
- Roller conveyor for palletized freight
- Wire strike protection system
- Armour protection
- Window and door guns
- Rescue hoist and hover trim controller
- Fast roping/rappelling kit
- Paratroop monorail
- Emergency flotation gear

RAPID DEPLOYMENT

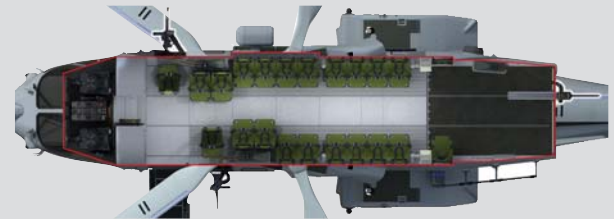
- Self deployable using auxiliary fuel tanks and/or air-to-air refuelling
- Transportable in C-17 aircraft
- Preparation and rebuild time less than 3 hours



Typical CSAR configuration



Typical Special Operation Configuration



Typical Troop Transport Configuration (21 Troops)

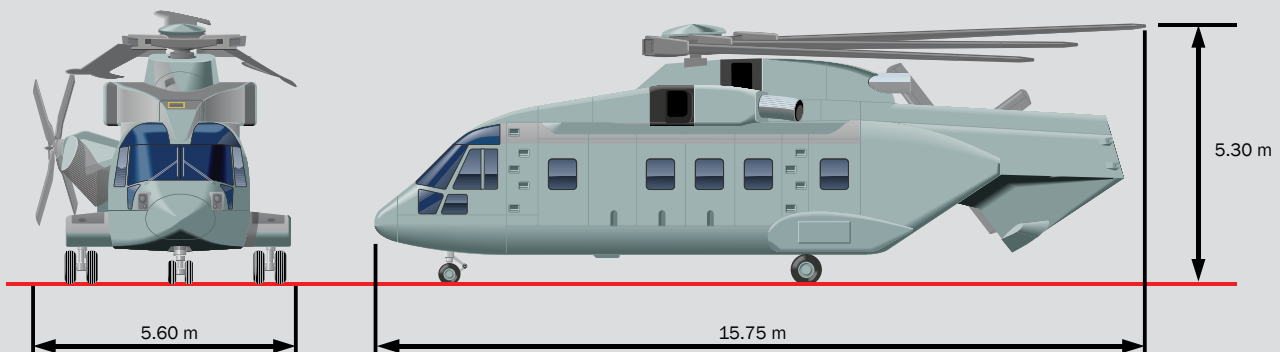
SHIP COMPATIBILITY

The AW101 was designed to operate from ships in adverse weather and sea conditions, providing the naval commander with a dependable force-multiplier

- Fully marinised for naval operations
- Electric blade and tail fold for ship hangar stowage
- Exceptional agility for demanding deck landing conditions
- Compatible with decklock harpoon and hauldown deck handling and retrieval systems
- Compact main rotor reduces deck spotting space requirements



AW101 FOLDED DIMENSIONS



OPERATIONAL SURVIVABILITY

Fully Integrated Defensive Aids Suite (DAS) options, including:

- Directed Infra Red Countermeasures (DIRCM)
- Missile Approach Warning System (MAWS)
- Radar Warning Receivers (RWR)
- Laser Warning Receivers (LWR)
 - 360° azimuth coverage
 - Integrated with RWR display
- Automatic Chaff and Flare counter-measure dispensing system (CMDS)
 - Six dispensers with any combination of chaff and flares
 - Supports manual or automated operation
 - Fully programmable response



- RWR SENSORS
- FWD CHAFF & FLARE DISPENSERS
- LWR SENSOR
- MAWS
- DIRCM



MODERN TECHNOLOGY



LOW WORKLOAD
ERGONOMIC COCKPIT

Advanced ‘dark’ cockpit design reduces crew workload by continuously monitoring systems for the crew and only providing warnings if crew action is necessary.

MODERN COCKPIT &
AVIONICS

- Full colour, integrated electronic instrument system
- Optimum presentation of data for low crew workload
- Single pilot operation
- Fully integrated core avionics system

AFCS

Fully coupled digital, dual-redundant automatic flight control system performs:

- Standard search patterns
- Automatic transitions to and from the hover
- Category II approaches
- Normal piloting functions

AFCS modes include:

- Altitude and airspeed hold
- Heading and vertical speed acquire
- Transition down and up
- Hover hold and trim
- Navigation
- ASW and SAR modes

SENSORS

- Search/Weather Radar
- FLIR
- TCAS

NAVIGATION

- Embedded GPS/INS
- Homing
- Doppler
- Full IFR RADNAV suite

COMPREHENSIVE, INTEGRATED HEALTH & USAGE
MONITORING SYSTEM (HUMS)

HUMS ensures the maximum safe life of components is achieved to keep operating costs and maintenance to a minimum.

- Provides real time monitoring of flight critical systems and components
- Gives warnings of potential failures before they become a safety hazard
- In-Built Check Out System (IBCOS)
- Built-In Test Equipment (BITE)

SYSTEM	HEALTH MONITORING	USAGE MONITORING
Airframe		Aircraft Operating Parameter ‘G’
Avionics	Fault Detection (Parallel Testing) (Requested Testing)	
Engines	Wear Debris Performance	Low Cycle Fatigue Thermal Fatigue Thermal Creep
Transmission	Wear Debris Vibration	Torque

MODERN TECHNOLOGY

MULTIPLE LOAD PATHS AND DAMAGE TOLERANCE

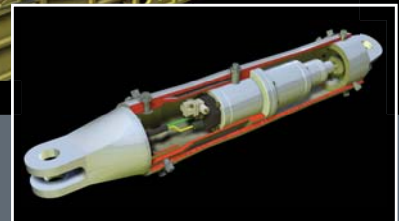
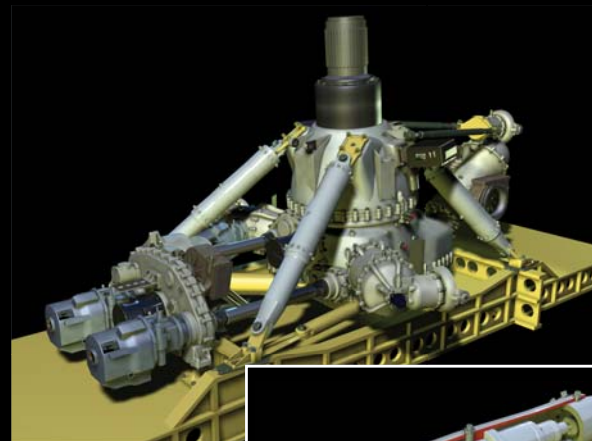
- Structure designed with multiple load paths for increased safety and damage tolerance
- Main rotor head incorporates multiple load paths
- Crashworthy design meets latest FAR/JAR

ROTOR HEAD

- Elastomeric bearings reduce maintenance
- 5% hinge offset for greater agility

COMPOSITE BLADES

- 30% greater efficiency than conventional blades of similar size
- Greater damage tolerance
- Nominal 10,000 hour life
- Reduced maintenance requirements



SYSTEM REDUNDANCY

- Three hydraulic systems
- Dual electrical generation system with APU generator and battery backup
- Dual fuel booster pumps with fuel tank crossfeed system; any engine can be supplied from any fuel tank

ACSR (ACTIVE CONTROL OF STRUCTURAL RESPONSE)

An award winning system that uses computer controlled forces to reduce the helicopter's basic vibration to very low levels. Effective throughout the flight envelope, ACSR contributes to:

- Reduced life cycle costs
- Reduced structural fatigue
- Greater avionic systems reliability
- Improved crew work environment and survivor comfort

The Most Capable Multi-Role



Maritime Helicopter



SAFETY & SURVIVABILITY

SURVIVABILITY

- High agility and power margins provide excellent flying qualities for shipborne operations, Airborne Mine Countermeasures, Special Operations, SAR missions and Nap of Earth (NOE) missions
- Widely separated engines and critical systems maximize survivability
- Multiple load paths and high system redundancy greatly increase survivability
- Proven 30 minute gearbox run-dry capability after total loss of oil
- Optional self-sealing fuel tanks



CRASHWORTHINESS

- Crashworthy fuel system with self-sealing breakaway couplings
- Airframe structure designed to withstand impact without compromising cabin volume
- Crashworthy seats for crew and cabin
- High energy absorption landing gear
- Reinforced cabin floor

MEETS CIVIL AND MILITARY SAFETY STANDARDS

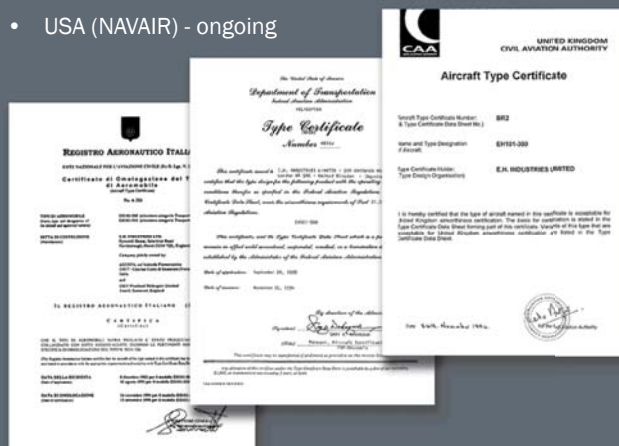
The AW101 meets, and in many cases exceeds, the most stringent safety standards currently laid down by civil and military airworthiness authorities around the world.

CIVIL CERTIFIED BY:

- CAA - United Kingdom
- FAA - USA
- RAI/ENAC - Italy
- JCAB - Japan

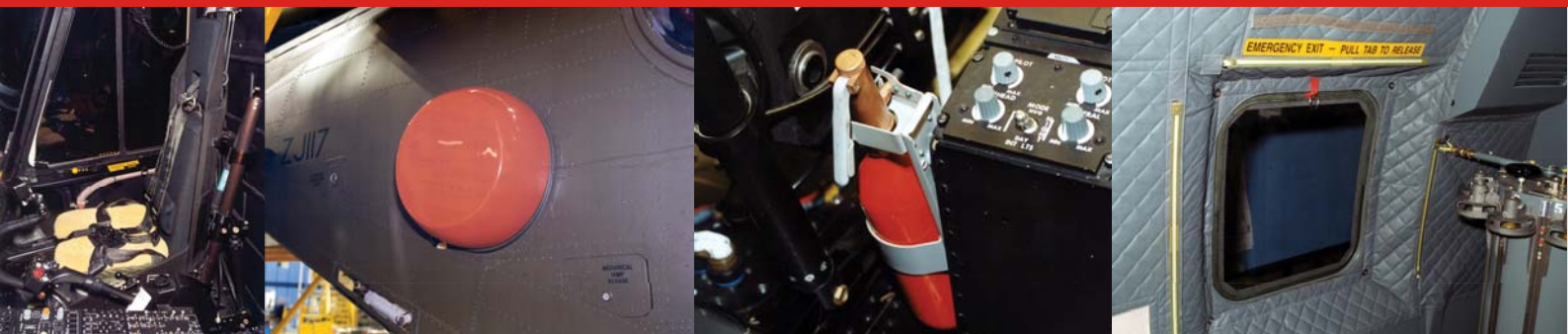
MILITARY QUALIFIED BY:

- United Kingdom
- Italy
- Canada
- USA (NAVAIR) - ongoing

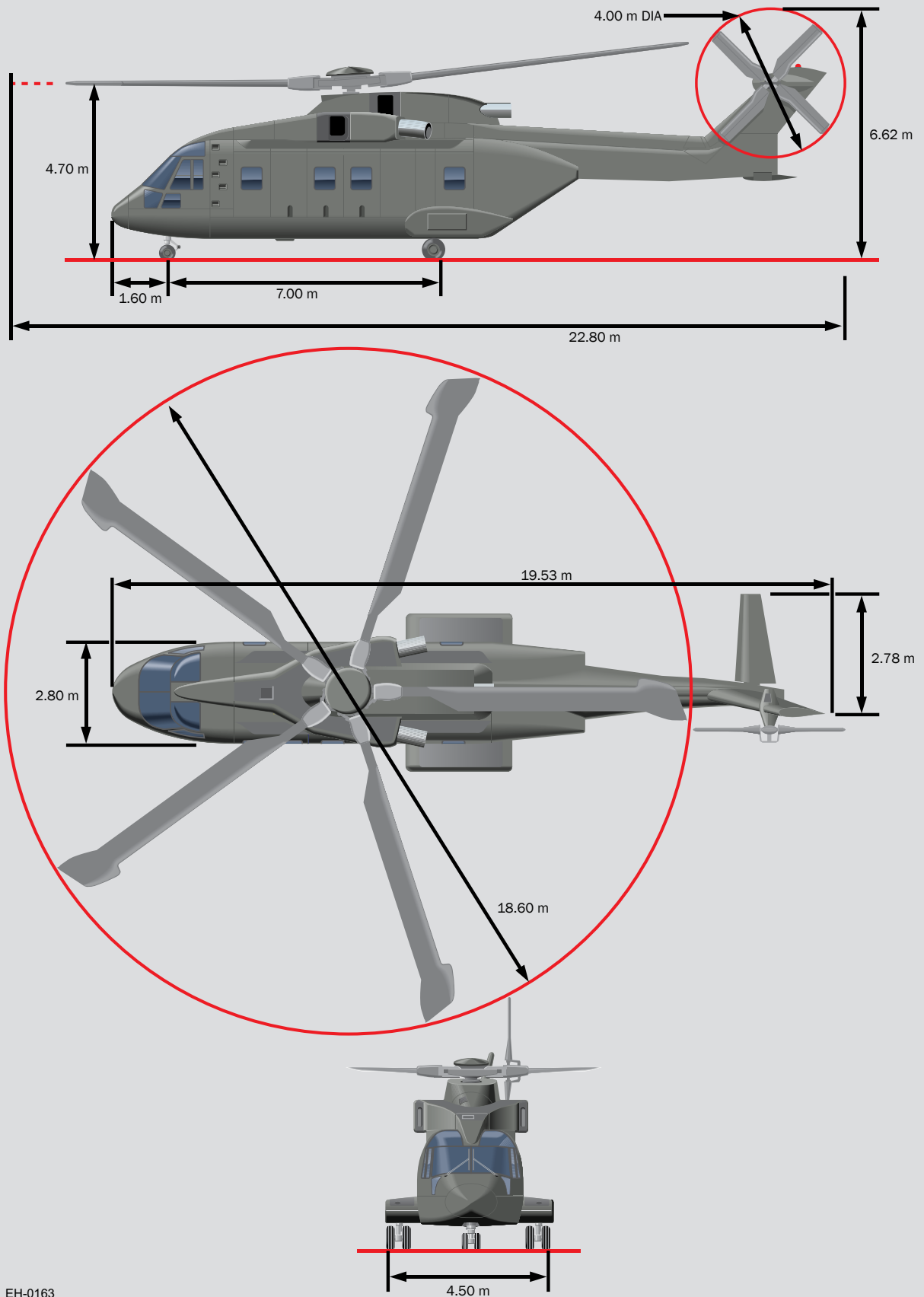


SAFETY

- Fully integrated HUMS monitoring of engines and transmission provides advanced warning of any potential failure before safety is compromised
- Cabin windows act as additional emergency exits
- Cabin doors on both sides of fuselage
- Cockpit crew dedicated emergency exits
- Emergency flotation gear keeps aircraft afloat in sea state 6
- Flight data and cockpit voice recorders
- Automatically Deployable Emergency Locator Transmitter (ADELT)



SPECIFICATION



EH-0163

SPECIFICATION

AIRFRAME

Modular airframe of aluminium alloy and composite construction

Constant cross section cabin

Integral footsteps, handholds, work platforms and walkways for easy access to transmission and rotor system

Sliding fairings and access panels for easy access

Cabin windows – jettisonable for emergency exit

Crashworthy pilot's and co-pilot's seats

Active Control of Structural Response (ACSR) active vibration control system

Cockpit and cabin environmental control system

Anti-iced windscreens with washing and wiping systems

Retractable tricycle landing gear with steering and braking system

High levels of corrosion protection

Port cabin door (sliding or airstair)

Starboard sliding cabin cargo door

Two easy access avionics cabinets

Two jettisonable cockpit emergency exits

Primary and standby pitot static systems

Cockpit, cabin and avionic bay environmental control systems

POWERPLANT & FUEL SYSTEM

Three CT7-8E (or RTM322 option) engines with integral inlet particle separators

Auxiliary Power Unit for engine start and ground power

Three air starters

Four or five crashworthy fuel tank system with option of self-sealing tanks

Single-point pressure refuelling and defuelling

Gravity refuelling point for each fuel tank

Fuel gauging system

Fuel system control panel

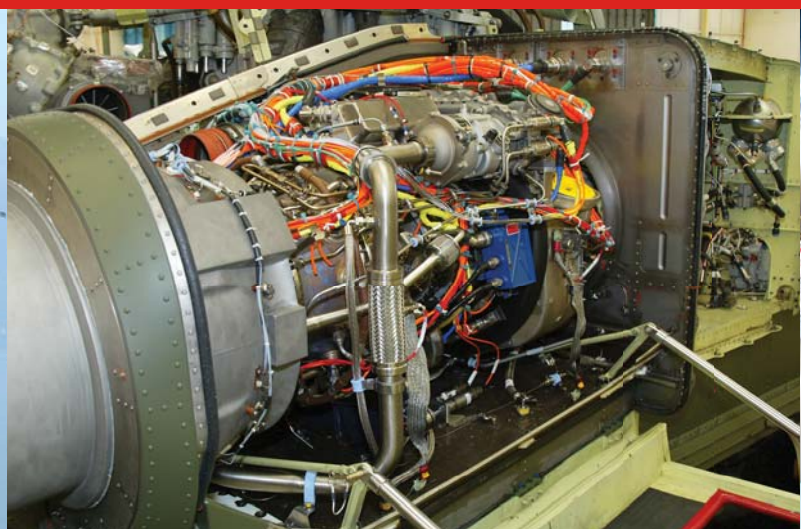
Duplex fuel boost pumps

HYDRAULIC SYSTEM

Three integrated hydraulic power supplies

Emergency accumulator

Hydraulic system control panel



SPECIFICATION

ROTORS AND CONTROLS

Five-blade composite articulated main rotor system with elastomeric bearings and dual load paths

Composite main rotor blades with optional de-icing system

Four-blade cross beam teetering tail rotor

Three duplex main rotor servo actuators

One duplex tail rotor servo actuator

Pilot and co-pilot flying controls

AVIONICS

Glass cockpit with colour electronic LCD units

Two flight/navigation display mode selectors

Two avionic and mission management computers

Data transfer module

Multifunction control and display units

Dual duplex digital automatic flight control system

Health and Usage Monitoring System (HUMS)

Cockpit caution warning system

Power systems display mode selector

Standby instruments

Central warning panel

Communication and navigation suite

Cockpit and Cabin Intercommunication System (ICS)

ELECTRICAL SYSTEM

Two 90 kVA generators

One 25 kVA generator

One 25 Ahr battery

AC and DC ground power points

Cockpit lighting

Cabin lighting

Anti-collision lights and navigation lights

Two landing lights, one steerable

Emergency lighting system

Electrical generation system control panel

TRANSMISSION

Main gearbox with three engine inputs and dual lubrication system

Accessory gearbox

Intermediate gearbox and tail rotor gearbox with interconnecting driveshafts

Quantitative debris monitors

Rotor brake



SPECIFICATION

WEIGHTS		
	kg	lb
Maximum Gross Weight	15600	34392
Typical Useful Load - Internal	6000	13228
External Cargo Capacity	4536	10000

FUEL CAPACITIES			
Two standards of fuel tanks are available offering increasing levels of protection			
4-Tank Installation	Litres	US Gallons	kg
Crashworthy Tanks	4160	1100	3328
Self-Sealing Tanks	4094	1080	3275
5-Tank Installation			
Crashworthy Tanks	5211	1380	4169
Self-Sealing Tanks	5120	1350	4095
Optional Auxiliary Cabin Tanks			
180 US Gallon Tank	649	180	519
400 US Gallon Tank	1389	400	1111

POWERPLANT RATINGS - CT7-8E or RTM322 (option)*			
ENGINE RATING	ENGINES OPERATING	shp	kW
5 min Take-off	3	2527	1884
30 min IRP	3	2488	1855
2 min Contingency	2	2522	1881
Max Continuous	3	2041	1522

TRANSMISSION RATING				
RATING	kW	shp	% ROTOR SPEED NR	% TORQUE
2.5 min Take-off	4161	5580	102	112
5 min Take-off	3955	5304	102	106.5
Max Continuous	3715	4982	102	100
2.5 min OEI	3096	4152	102	125
Continuous OEI	2774	3720	102	112

* The figures in this chart are for CT7-8E. RTM322 figures are projected to be similar





PERFORMANCE

ALL ENGINES OPERATING

ISA

Maximum Cruise Speed	150 knots	278 km/h
Recommended Cruise Speed	139 knots	257 km/h
Best Range Fuel Flow**	1650 lb/hr	750 kg/h
Best Endurance Speed	80 knots	148 km/h
Hover In Ground Effect	10800 ft	3290 m
Hover Out of Ground Effect	4800 ft	1460 m
Oblique Rate of Climb	2788 ft/min	14.2 m/s

ISA +20°C

Hover In Ground Effect	8400 ft	2560 m
Hover out of Ground Effect	2600 ft	790 m

ISA +35°C

Hover In Ground Effect	5400 ft	1650 m
Hover Out of Ground Effect	2600 ft	790 m

ONE ENGINE INOPERATIVE

ISA

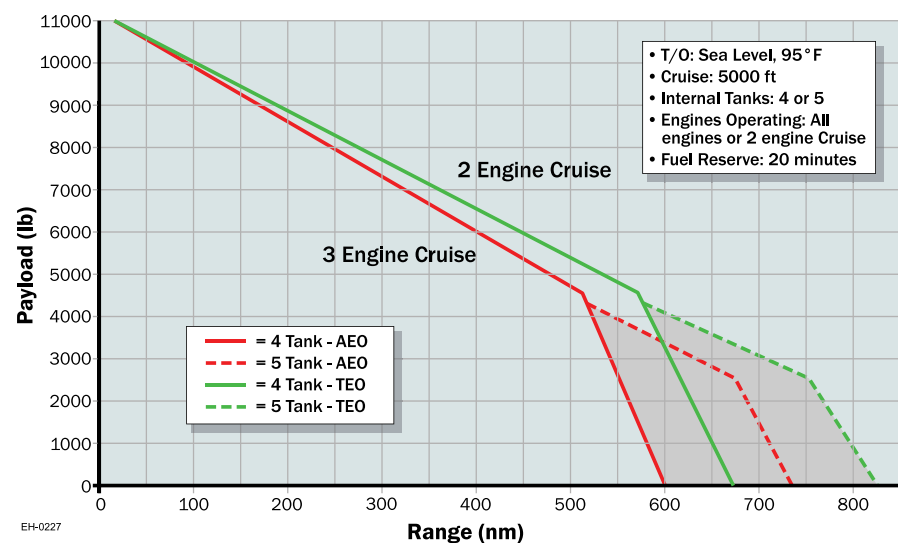
Maximum Weight to HIGE	31500 lb	14300 kg
Oblique Rate of Climb	1470 ft/min	7.5 m/s
Service Ceiling	10000 ft	3050 m

ISA +35°C

Service Ceiling	6100 ft	1860 m
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CAT A (SAFE FLYAWAY) PERFORMANCE

- ISA+35°C, Sea Level, Maximum Gross Mass 15600 kg with the CT7-8E engine
- The three-engine AW101 has 75% of take-off power available for OEI flyaways, compared with 60% for typical two-engine helicopters



** At typical mid mission mass

CUSTOMER SUPPORT

CUSTOMER SUPPORT

The AW101 benefits from the continuous application of an extensive Integrated Logistic Support (ILS) process. The delivered aircraft meets demanding supportability requirements while operators receive efficient, cost-effective product support services.

A comprehensive database of support information generated by Logistic Support Analysis (LSA) is continuously improved by feedback from operators.

PREVENTATIVE MAINTENANCE

The AW101 benefits from:

- Maintenance Planning within LSA using MSG-3 (Maintenance Steering Group 3) logic
- Civil Airworthiness Authorities' Maintenance Review Board
- Scheduled maintenance tasks performed after a minimum of 200 flying hours
- UK MoD contract for maximum preventative maintenance of 1.7 man hours per flying hour

INTERACTIVE ELECTRONIC TECHNICAL PUBLICATIONS

The AW101 IETPs comprise:

- 'State-of-the-Art' electronic publishing technology
- Fully validated data held on an extensive modular database
- Specification S1000D chapter structure and illustrated parts catalogue
- Hyperlinks to electronic ground station download facility

RELIABILITY AND MAINTAINABILITY

The AW101 has undergone the most intensive reliability and maintainability development and maturity testing. The results have shown that all targets for the helicopter have been exceeded. It has completed over eight years of operation in a wide range of military and civil roles.



CUSTOMER SUPPORT

MATERIAL SUPPORT

The operator's spares pack is based on:

- Analysis of the defined maintenance tasks
- Specific aircraft configuration
- Innovative, cost-effective support arrangements tailored to operator requirements

Operators can be fully involved in the analysis, which uses the LSA database and a comprehensive Level of Repair Analysis (LORA) based on a version of the Equipment Designer Cost Analysis System (EDCAS).

CUSTOMER TRAINING

The AW101 is supported by training centres with the latest training technologies, training pilots and maintainers in all aspects of the AW101 operations and maintenance.

Our training services include:

- Training needs analysis, course design and media selection
- Development and preparation of courseware and course materials
- Computer Based Training
- Delivery of On-Site Courses
- Comprehensive, long-term Training Services
- Turn-key Training Solutions and Equipment Supply
- Simulators
- Cockpit Procedure Trainers
- Part-Task Trainers



REPAIR AND OVERHAUL

Factory Repair and Overhaul is supported by comprehensive facilities covering all aspects of the aircraft, including:

- Airframe
- Rotor blades
- Avionics
- Transmissions
- Hydraulics

Repair and Overhaul can also be established at customers' facilities to provide a highly responsive service.



CUSTOMER BENEFITS

The AW101 provides unmatched role flexibility providing customers with a cost-effective solution to a wide range of maritime mission requirements.

The AW101 OFFERS:

- Large capacity reconfigurable cabin - capable of carrying F-18 and F-35 engine modules, bulk containers, more than 30 seated passengers, 16 litters, vehicles and variations thereof
- Long range and endurance - over 800 nm demonstrated
- Multi-role flexibility - Utility, Airborne Re-supply, ASW, ASuW, AEW, AMCM, Special Operations, Combat SAR, CASEVAC
- New technology design with substantial future growth potential
- Cost-effective through-life-support and training based on eight years of operational experience
- Maturity through growing in-service fleet experience. The EH101 entered service in 1999 and achieved 100,000 flight hours in 2006
- Optimal operationally, cost and manpower effective multi-role helicopter capability



Total Multi-Role Flexibility

Large Capacity

Multi-Role Capability



Ship Compatibility



Operational Survivability



Modern Technology



Safety & Survivability



Customer Support

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