Merlin HM.1 - 2006

United Kingdom



Type: Anti-Submarine Warfare (ASW)
Min Speed: 55 kt
Max Speed: 160 kt
Commissioned: 2006
Length: 19.4 m
Wingspan: 4.5 m
Height: 6.6 m
Crew: 4
Empty Weight: 11500 kg
Max Weight: 15600 kg
Max Payload: 5400 kg
Propulsion: 3x RTM 322-01/8

Sensors / EW: - Generic MAD - MAD, MAD, Max range: 1.9 km
- ARI.18242 Orange Reaper - (Kestrel, Type 242) ESM, ELINT, Max range: 926 km
- Blue Kestrel 7000 - (Kestrel, Type 242) Radar, Radar, Surface Search, Medium-Range, Max range: 185.2 km
- Type 2095 [FLASH] - (ASQ-950) Dipping Sonar, Active/Passive, Dipping Sonar, Active/Passive Shallow Water Search & Track, Max range: 14.8 km

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Weapons / Loadouts:
- Stingray Mod 1 - (2006) Torpedo. Subsurface Max: 7.4 km.
- SSQ-963D CAMBS VI - (2004?, A-Size, 99 Chn, 1-4hr) Sonobuoy.
- SSQ-926 ALFEA - (2001, A-Size, 99 Chn, Active) Sonobuoy.
- Stingray Mod 0 - (1986) Torpedo. Subsurface Max: 7.4 km.

OVERVIEW: The AgustaWestland AW101 is a medium-lift helicopter used in both military and civil applications. It was developed by joint venture between Westland Helicopters in the UK and Agusta in Italy in response to national requirements for a modern naval utility helicopter. Several operators, including the armed forces of Britain, Denmark and Portugal, use the name Merlin for their AW101 aircraft. Since the AW101's introduction it has replaced several older helicopter types such as the Sikorsky S-61, performing roles such as medium-sized transport, anti-submarine warfare, and ship-based utility operations.

The Royal Canadian Air Force (RCAF) operates a variant of the AW101, designated CH-149 Cormorant, in the air-sea rescue role. Another variant, designated VH-71 Kestrel, was developed to serve in the US presidential transport fleet, however the program was cancelled. Civil operators also use AW101s in roles such as passenger and VIP transportation. The type has been deployed to active combat theatres, such as in support of coalition forces during the Iraq War and the War in Afghanistan.

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DETAILS: The AW101 Merlin follows a conventional design layout but makes use of advanced technologies such as the design of the rotor blades, avionics systems, and the extensive use of composite materials. The fuselage structure is modular and comprises an aluminium-lithium alloy, designed to be both light and damage-resistant. The AW101 is designed for operating in extreme weather conditions; it is fitted with a de-icing system and rated to operate in temperatures ranging between -45 to +50 degrees C. The aircraft's control systems allow the AW101 to maintain a stable hover in 74 km/h (40 kn) crosswinds.

An active vibration control system, known as the active control of structural response system, reduces airframe vibration by up to 80% which increases crew comfort and minimises the buildup of stress on the airframe. The cockpit is fitted with armoured seats for the crew, and can withstand an impact velocity of over 10 m/s. Dual flight controls are provided, though the AW101 can be flown by a single person. The pilots' instrument displays include six full-colour high-definition screens and an optional mission display; a digital map or forward-looking infrared (FLIR) display can also be installed.

The AW101 is powered by three turboshaft engines. The engines power an 18.59 metre diameter five-bladed main rotor. The shaping of the main rotor blades is derived from the BERP rotor blades first used on the Westland Lynx. This blade design improves aerodynamic efficiency at the blade tip and reduces the noise signature. Improved BERP IV rotors have since been developed; when installed, this increases the AW101's maximum takeoff weight.

Most variants of the AW101 are equipped with self-defence systems such as chaff and flare dispensers, directed infrared countermeasures (infrared jammers), ESM (electronic support measures in the form of RF heads), and a laser detection and warning system. British Merlins have been outfitted with protective armouring against small-arms fire. A chin-mounted forward looking infrared (FLIR) imaging sensor has been fitted to some variants.

Westland and IBM formed a consortium in 1991 to perform the helicopter's complex systems integration. The AW101 features a network of helicopter management and mission systems designed to reduce pilot workload and enable the helicopter to undertake a wide variety of missions. A digital automatic flight control system (AFCS) is employed by the AW101. The AFCS allows the operation of a four-axis (pitch, roll, yaw and collective) autopilot and the automatic stabilisation system, and is linked in with the aircraft's flight management systems. The AFCS, manufactured by Smiths Aerospace, is a dual-duplex system using two flight computers to provide redundancy and fault-tolerance.

The AW101's navigation system includes a GPS receiver and inertial navigation system, VHF omnidirectional radio range (VOR), instrument landing system (ILS), TACAN, and automatic direction finding. The Mk1 and Mk3 are equipped with a Doppler velocity system (DVS) which provides relative ground velocities; the DVS is also linked into the AFCS as part of the autostabilisation system. For safety, the aircraft is equipped with obstacle and terrain avoidance warning systems, traffic collision avoidance system (TCAS), and both voice and flight data recorders.

The AW101 is equipped with the Blue Kestrel search and detection radar which is capable of 360 degree scanning and can detect small targets as far as 25 nautical miles. As part of the Royal Navy's Merlin HM2 upgrade program, Lockheed Martin implemented a series of improvements to the radar, notably allowing it to track 40 times the number of targets previously capable. Danish EH101s are fitted with the RDR-1600 search and weather radar. Royal Navy Merlins are equipped with the AQS901 anti-submarine system for processing sonographic data from sonobuoys to detect and target submerged submarines. The AQS901 was derived from the system on the earlier Hawker Siddeley Nimrod maritime patrol aircraft.

TYPE: Three Engine Medium Lift Transport/Utility/ASW Helicopter.

SPECIFICATIONS: Crew: (3-4) || Capacity: 26 troops (38 passengers) or 5 tonnes of payload or 4 stretchers (with sonar

removed) || Length: 19.53 m-fuselage length (64 ft 1 in) || Rotor diameter: 18.59 m (61 ft 0 in) || Height: 6.62 m (21 ft 8.75 in) || Max. takeoff weight: 14,600 kg (32,188 lb) || Powerplant: (3) Rolls-Royce Turbomeca RTM322-01 turboshafts, 1,566 kW (2,100 shp) (take-off power) each.

PERFORMANCE: Never exceed speed: 309 km/h (167 knots, 192 mph) || Cruise speed: 278 km/h (150 knots, 167mph) || Range: 833 km (450 nmi, 517 mi) || Endurance: 5 hours || Service ceiling: 4,575 m (15,000 ft).

SENSORS: Smiths Industries OMI 20 SEP dual-redundant digital automatic flight control system || BAE Systems LINS 300 ring laser gyro, Litton Italia LISA-4000 strapdown AHRS || Selex Galileo Blue Kestrel 5000 maritime surveillance radar || Racal Orange Reaper ESM || Thomson Marconi Sonar AQS-903 acoustic processor || Active/passive sonobuoys || Thomson Sintra FLASH dipping sonar array.

ARMAMENT: Sting Ray homing torpedoes || depth charges.

SOURCE: [SCO] Wikipedia http://en.wikipedia.org