

HISTORY, DEVELOPMENT AND STRUCTURE OF THE EUROCOPTER AS532 COUGAR

Kadirov Mansur Mirzaxakimovich

Senior Lecturer, Department of aviation weapons, major
The Higher Military Aviation School The Republic of Uzbekistan
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Annotation. The Eurocopter AS532 Cougar (now Airbus Helicopters H215M) is a twin-engine, medium-weight, multipurpose helicopter developed by Euro copter. The AS532 is a development and upgrade of the Aérospatiale SA 330 Puma in its militarized form. Its civilian counterpart is the Eurocopter AS332 Super Puma. The AS532 has been further developed as the Eurocopter EC725.

Design and development.

Keywords: Eurocopter AS532 Cougar, AS532 UL/AL, AS532 SC, AS535, Main rotor diameter, General characteristics.

The AS332 Super Puma, designed as a growth version to replace the SA 330 Puma, first flew in September 1977. It was fitted with two 1,330 kW Turbomeca Makila 1A1 turboshaft engines, composite rotor blades, improved landing gear and a modified tailfin.

In 1990 all military Super Puma designations were changed from "AS 332" to "AS 532 Cougar" to distinguish between the civil and military variants of the helicopter.

Canada had considered purchasing the Cougar to replace their CH-113 Labrador, but opted in the end to purchase the CH-149 Cormorant. In 2012 France began a €288.8m project (€11.1m/unit) to upgrade 23 Army Cougars and 3 for the Air Force to address obsolescence issues and to deliver similar avionics to their EC225 and EC725 helicopters.



Pic.1. Eurocopter AS532

Variants

AS532 UL/AL

The AS 532 UL/AL is the long version of the Cougar family and is powered by two Turbomeca Makila 1A1 turboshaft engines. It carries a crew of 2 and up to 29 troops or 6 injured passengers on stretchers plus 10 others. As with the other versions of the Cougar, the AS 532 UL/AL can lift 4.5 tons by means of a sling. The Horizon battlefield ground surveillance



system can be installed on the AS 532 UL (utility version). The AS 532 AL (armed version) can also be fitted with a variety of weapons, including pod-mounted 20 mm cannons, 68 mm rocket-launchers, and side-mounted rapid fire machine-guns.



Pic.2. AS532 UL/AL

AS532 SC

The AS 532SC is the naval version of the Cougar family and is powered by two Turbomeca Makila 1A1 turboshaft engines. This version is mainly used for Anti-surface unit warfare (ASUW), fitted with AM 39 Exact missiles; Anti-submarine warfare (ASW), fitted with a variable-depth sonar and torpedoes; Search and rescue; and Sea patrols. For deck landing, securing at high sea states, maneuver and traverse this variant can be fitted with ASIST.

AS535

It was variant offered to cover the Combat Search and Rescue (CSAR or *RESCO* in French) needs of the French Army. The military preferred to acquire the improved version of the aircraft, the Eurocopter EC725 instead to fulfill this gap.

Specifications (AS532 UB)

Data from Brassey's World Aircraft & Systems Directory

General characteristics

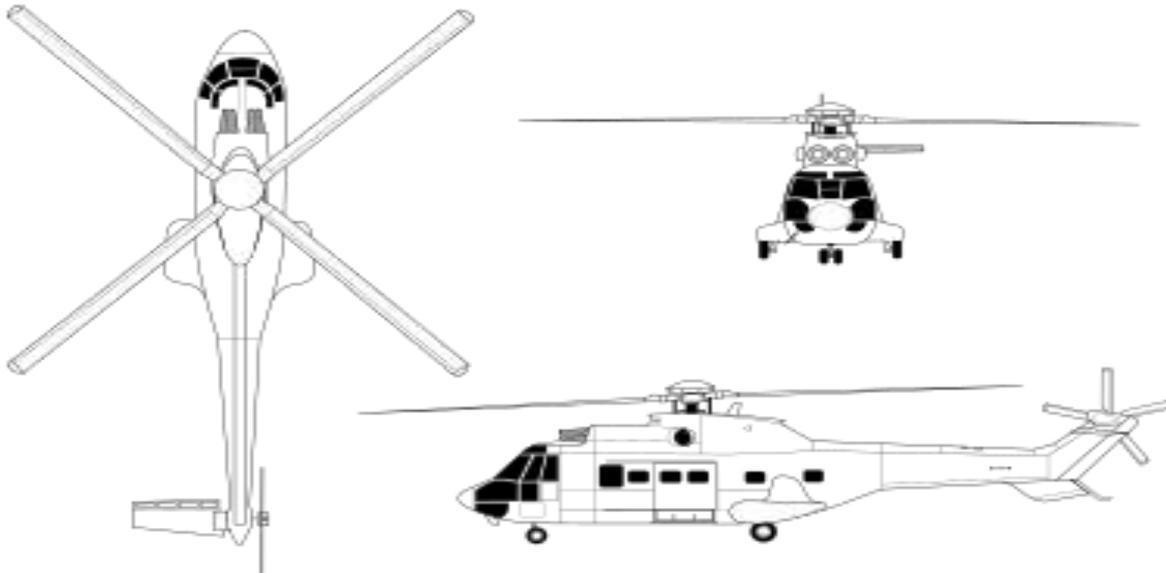
- **Crew:** 2
- **Capacity:** 20 troops / 4,650 kg (10,251 lb) payload
- **Length:** 15.53 m (50 ft 11 in)
- **Height:** 4.92 m (16 ft 2 in)
- **Empty weight:** 4,350 kg (9,590 lb)
- **Max takeoff weight:** 9,000 kg (19,842 lb)
- **Powerplant:** 2 × Turbomeca Makila 1A1 turbo shaft engines, 1,185 kW (1,589 hp) each
- **Main rotor diameter:** 15.6 m (51 ft 2 in)
- **Main rotor area:** 206 m² (2,220 sq ft)

Performance

- **Maximum speed:** 249 km/h (155 mph, 134 kn)
- **Cruise speed:** 239 km/h (149 mph, 129 kn)
- **Never exceed speed:** 278 km/h (173 mph, 150 kn)
- **Range:** 573 km (356 mi, 309 nmi)



- **Service ceiling:** 3,450 m (11,320 ft)
- **Rate of climb:** 7.2 m/s (1,420 ft/min)



Pic.3. Sketch of AS532 UB

AS 532 U2/A2 Cougar Multi-Purpose Helicopter

The Eurocopter Company manufactures the Cougar family of twin engine helicopters, of which more than 350 have been order.

Crew - Two

Passenger Capacity - 20

Maiden Flight - September 1977

Manufacturer- Eurocopter Company

Operators - French Army, Bulgarian Air Force, Slovenian Army, Saudi Arabia and Turkey armed forces

Length- 18.70m

Height - 4.92m

Width - 3.88m

Fuselage Length - 15.53m

Main Rotor Diameter - 15.60m

Tail Rotor Diameter - 3.05m

Disc Area - 206m²

Crew- 2

Manufacturer-Eurocopter

Troops-29

Main Rotor Diameter-16.2m

Tail Rotor Diameter-3.15m

Overall Width-3.86m

Overall Length, Rotors Turning - 19.5m

Overall Height, Tail Rotor Turning - 4.97m

Width of Wheel Track - 3m

Cabin, Maximum Length x Width x Height - 6.15m x 1.8m x 1.45m



Empty Weight - 4,760kg
Maximum Take-Off Weight - 9,000kg
Useful Load - 4,650kg
Payload-Internal load: 3,000kg
External on sling only: 4,500kg
Type - 2 × Turbomeca Makila 1A1 turboshaft
Empty Weight-4,760kg
Payload - Internal load: 3,000kg
External on sling only: 4,500kg
Power Capacity - 1,240kW each
Maximum Take-Off Power - 1,380kW
Maximum Speed - 278km/h
Cruise Speed - 231km/h
Rate of Climb - 6.2m/s
Range - 573km
Service Ceiling - 3,450m
Endurance - Four hours
Type - 2 × Turbomeca Makila 1A2
Power - 1,240kW
Never-Exceed Speed - 327km/h
Cruise Speed - 273km/h
Cruise Speed, Maximum Range - 242km/h
Range, Standard Fuel - 796km
Range, Maximum Fuel - 1,176km
Endurance - 4 hours 20 minutes
Guns - 2 × 20mm cannons
2 × 12.7mm machine guns
Rockets - Pod-mounted rockets
Guns - 2 × 20mm cannons
2 × 12.7mm machine guns
Rockets -Pod-mounted rockets

The Eurocopter Company manufactures the Cougar family of twin engine helicopters, of which more than 350 have been ordered. Eurocopter is a subsidiary of EADS (European Aeronautics Defence and Space) company formed by DaimlerChrysler Aerospace of Germany, Aerospatiale Matra of France and CASA of Spain.

The helicopter is in service with 28 air forces, eight armies and five navies. 64 are operational with the French Army. As well as the AS 532 A2 combat search and rescue (CSAR) helicopter, there are two other versions of the Cougar: the AS532 Horizon surveillance system operated with a ground station, and the AS532 UB/AB utility version.

Orders and deliveries

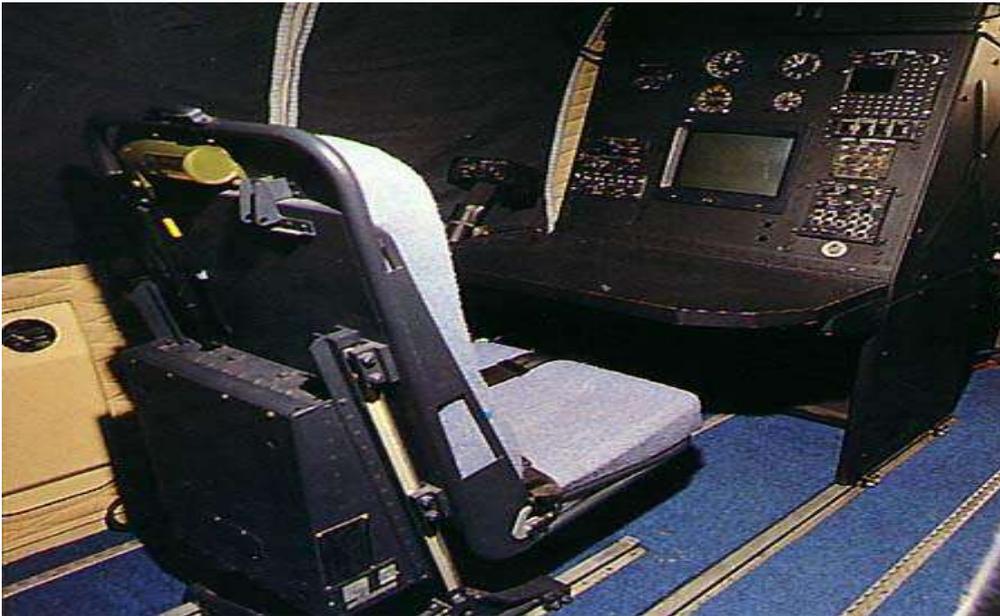
Orders include four for Slovenia which were delivered in 2003/2004 and 12 (four CSAR and eight utility) for Bulgaria, ordered in November 2004. The first AS 532 was delivered to Bulgaria in August 2006.

Deliveries for Bulgaria began in August 2006 and the final (12th) AS 532 was delivered in July 2009. The first eight helicopters delivered to Bulgaria are being used as utility helicopters for carrying troops or injured people on stretchers with other medics or passengers.

Spain ordered an additional two transport helicopters in December 2007. In November 2010, the Directorate General of Armaments (DGA) of France awarded a \$294m contract to Eurocopter for the upgradation of four Cougar helicopters. The upgrade will involve the replacement of the avionics and self-protection systems and installation of a new terminal information system in helicopters.

Cougar multi-role helicopter design

The helicopter has a high level of crashworthiness, including impact tolerance and redundancy in vital systems and components. The occupants of the helicopter are protected up to impact velocities of 11.4m/sec. The fuel tanks are self-sealing, with a fuel crossfeed system that provides continuity of supply if one of the fuel circuits fails.



Pic.4. The cabin console with radar and FLIR display

The main rotor and the tail rotor are equipped with high-impact-tolerance Spheriflex hubs, which have unlubricated metal antifriction bearings. The rotors are tolerant to impact from rounds from 20mm cannon and 12.7mm machine guns. The gearboxes are capable of running for 30 minutes up to one hour and 30 minutes without lubrication.

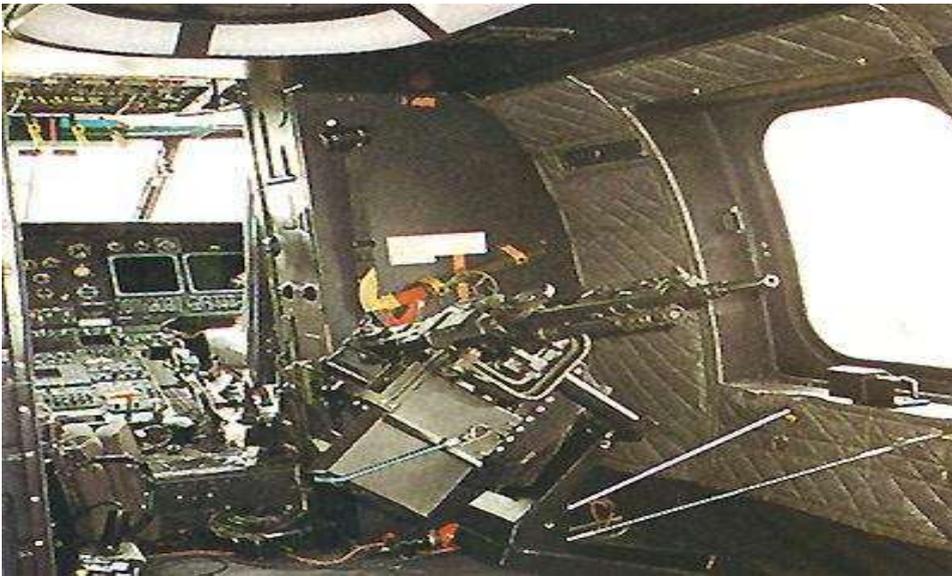
The helicopter is fitted with a 272kg capacity rescue hoist and an external sling. The enlarged sponsons provide additional stowage for carrying extra fuel, life rafts, floats or other equipment. The helicopter is equipped with emergency flotation landing gear for over-water missions.

Combat search and rescue (CSAR)

Eurocopter's combat search and rescue (CSAR) helicopter is in service with the armed forces of France, Saudi Arabia and Turkey.

"The AS 532 U2/A2 Cougar helicopter has a high level of crashworthiness."

A personnel locator system (PLS) is used to locate survivors, which is based on an encrypted communications homing system.



Pic.5. The machine guns fire out of the doorways from within the cabin

This communicates with the Thales Avionique Nadir mk2 navigation computer, which selects the navigation mode according to the phase of the mission and controls the integrated flight display, which is presented on four flat screens.

Nadir mk2 interfaces to the positional and navigation equipment on the helicopter, the global positioning system, the inertial navigation, Doppler radar, the VHF omnidirectional radio range equipment (VOR), tactical air navigation (TACAN) and distance measuring equipment (DME).

The Cougar is equipped with observation domes to the cabin doors, searchlight, forward-looking infrared sensor (FLIR) and panoramic view detection radar with homing and personnel location system functions. The crew are equipped with third-generation night-vision goggles, and the mk2 Cougar aircraft cockpit and cabin area is night-vision goggle compatible.

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