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Airbus Helicopters H120

Outlook

- Production of the H120 ended in 2017
- More than 700 H120s were built over the life of the program

Orientation

Description. Five-place, single-turboshaft-powered light helicopter.

Sponsor. The H120 was sponsored jointly by Airbus Helicopters, China National Aero-Technology Import and Export Corp (CATIC), and Singapore Technologies Aerospace.

Status. Production of the H120 was terminated in 2017.

Total Produced. Approximately 742 EC 120/H120s were produced.

Application. Commercial applications included flight training, emergency medical services, corporate / executive transportation, general passenger transportation, environmental protection, resource development, and law enforcement. Principal military application was pilot training.

Price Range. Estimated at $2.087 million in 2017 U.S. dollars.

Airbus Helicopters H120

H120

Source: Airbus SE

Contractors

Prime

Airbus Helicopters	http://www.airbus.com/helicopters.html, Aeroport Int'l Marseille Provence, Marignane, France, Tel: + 33 4 42 85 85 85, Fax: + 33 4 42 85 85 00, Prime

Subcontractor

Hafei Aviation Industry Co Ltd	http://www.hafei.com, 15 Youxie St, Pingfang District, Harbin, China, Tel: + 86 451 86580114 (Central and Intermediate Structure; Canopy; Upper Cowlings; Standard Cabin Doors; Fuel System)
Safran Helicopter Engines (Turbomeca)	http://www.safran-helicopter-engines.com, Avenue Joseph Szydlowski, Bordes, France, Tel: + 33 5 59 12 50 00, Fax: + 33 5 59 53 15 12 (Arrius 2F Turboshaft)
Singapore Technologies Aerospace Ltd	http://www.staero.aero, 540 Airport Rd, Paya Lebar, Singapore, Tel: + 65 62871111, Fax: + 65 62809713 (Tail Boom; Horizontal Stabilizer; Fenestron Assembly; Instrument Pedestal; Doors)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. Single-main-rotor helicopter that incorporated a partially composite fuselage and tailboom combination, a three-blade main rotor with a Spheriflex hub, and a Fenestron anti-torque system.

	Metric	U.S.
Dimensions		
Length overall, rotors turning	11.52 m	37.79 ft
Width, skid-to-skid	2.07 m	6.79 ft
Height overall	3.40 m	11.15 ft
Main rotor diameter	10.0 m	32.81 ft
Weight		
Empty weight (standard)	994 kg	2,191 lb
Maximum takeoff weight	1,715 kg	3,781 lb
Maximum takeoff weight with external load	1,800 kg	3,968 lb
Maximum sling load	700 kg	1,543 lb
Performance(a)		
VNE	278 km/h	150 kt
Hover ceiling OGE at takeoff power	2,316 m	7,600 ft
Service ceiling	5,182 m	17,000 ft
Maximum range without reserves	710 km	383 nm

Propulsion

H120 (1) Safran Arrius 2F turboshaft engine rated 376 kW (504 shp).

Seating/Accommodation

Seating for one pilot and four passengers, or two pilots and three passengers.

(a) At maximum takeoff weight, ISA, SL.

Variants/Upgrades

H120. Baseline version formerly known as the EC 120B and originally designated as the P.120L. At one time, plans had called for this helicopter to be in the 2-tonne class. First flight was scheduled for 1993, with deliveries to begin in 1996. The aircraft was to be equipped with a Turbomeca Arriel engine rated 670-750 shp. However, Eurocopter subsequently revised the design of the H120 (as the helicopter was later called), downsizing it to 1.5 tonnes to reduce development, acquisition, and operating costs.

The cockpit was very basic, with what Airbus Helicopters called "classic" instrumentation. Maximum range was 710 kilometers (383 nm) and maximum speed was 278 km/h (150 kt). The original four-blade rotor system was replaced by a three-blade unit, and the all-composite fuselage was scrapped and replaced by one with significantly more aerospace light alloys.

The H120 was marketed with the Safran (formerly Turbomeca) Arrius 2F engine rather than the Arriel 1D1 previously selected. The Arrius 2F was originally known as the Arrius 1F.

EC 120HP. This proposed high-performance version was to have been marketed alongside the baseline EC 120B/H120. The EC 120HP was to have featured a higher cruise speed, payload, and service ceiling, but less range.

Original plans called for the EC 120HP to be marketed with an uprated Arriel 2 engine, a Pratt & Whitney Canada PW208 engine, or possibly a choice of either. The HP model was eventually tabled.

EC 120 Twin. Eurocopter had at one time discussed a possible twin-engine version of the EC 120/H120. It would have been developed had Eurocopter decided against launch of the EC 135/H135 twin-turbine helicopter.

Airbus Helicopters H120

Program Review

Background. Originally known as the New Light Helicopter, the H120 Colibri (Hummingbird) was produced by Airbus Helicopters, CATIC of the People's Republic of China (PRC), and Singapore Technologies Aerospace. It was one of the first rotorcraft to begin production under the Eurocopter name. Eurocopter was formed in the early 1990s by a merger of the Aerospatiale and MBB helicopter operations, and was renamed Airbus Helicopters in January 2014.

The 1.5-tonne-class, single-turbine-powered H120 rotorcraft was designed expressly for the commercial market. Particular emphasis was placed on low acquisition and operating costs and on the Asia/Pacific region.

An initial agreement was signed by Aerospatiale, CATIC, and Aerospace Technologies of Australia (ASTA) in early 1988, and detailed technical cooperation and work-sharing arrangements were to have been concluded at the end of that year. CATIC and Aerospatiale were each expected to assume a 35 percent program share, with ASTA taking a 30 percent stake. However, ASTA withdrew from the project in 1989, having had difficulty raising the necessary private financing and resolving ongoing disputes with Aerospatiale. Moreover, ASTA was concerned with what it considered to be overly optimistic sales projections for the P.120L (as the helicopter was then known). Later in 1989, Singapore Aerospace entered the picture, and the program was restructured in February 1990 to give Aerospatiale a 54 percent share, with CATIC and Singapore Aerospace taking 30 percent and 16 percent shares, respectively. Program shares were revised once more in 1992, with Eurocopter taking 61 percent, CATIC 24 percent, and Singapore Aerospace (later known as Singapore Technologies Aerospace) the final 15 percent.

Design Details. Aerospatiale/Eurocopter had a difficult time determining just how large (or small) the rotorcraft would be. Originally, it was intended to be in the 2,500-kilogram class and powered by two 450-600 shp class turboshaft engines. However, Aerospatiale later decided that the helicopter should be directly competitive with the new NOTAR-equipped MD900 Explorer of McDonnell Douglas Helicopter, so it was redesigned to fit below the MD900 at around 2 tonnes and have only a single engine.

In early 1993, Eurocopter and its partners again redesigned the helicopter and renamed it the EC 120. The three partners reduced the gross takeoff weight of the aircraft from 2.2 tonnes to 1.5 tonnes. A less capable rotor system with three rotor blades rather than four was incorporated. The partners also decided to produce only a single version (for civil missions) rather than the two (civil and military) that had earlier been planned.

The changes in the program were expected to reduce development costs by 20 percent and to result in a helicopter that cost 30 percent less to operate than Eurocopter's AS 350B2 Ecureuil.

Participant Shares. Airbus Helicopters had a 61 percent stake in the program, and acted as program manager. It was responsible for final assembly and for producing various components. CATIC (24 percent), through Hafei Aviation Industry Company Ltd (HAI), supplied the central and intermediate structure, the canopy, the upper cowlings, the standard cabin doors, and the fuel system. Singapore Technologies Aerospace (15 percent) produced the tailboom, the horizontal stabilizer, the Fenestron assembly, the instrument pedestal, and doors.

Program History. First flight of the initial EC 120 prototype occurred in June 1995 at Eurocopter's flight test facility in Marignane, France. This prototype (PT1) was used for airframe flying quality and vibration tests. The second prototype (PT2), which first flew in July 1996, was more lightly instrumented than PT1, and was used to refine low-weight tests and finalize development of such systems and components as the basic avionics package, the sliding door, and optional items such as the sand filter, the skids, the sling, and the air conditioning.

In June 1997, the EC 120 was certificated to JAR 27 standards by the European Joint Aviation Authorities (JAA). The first production aircraft made its initial flight in October 1997. Certification by the U.S. Federal Aviation Administration (FAA) was granted in January 1998. The initial delivery of an EC 120 occurred later that month, to Nozaki Aerospace of Japan.

In March 2015, the EC 120 was renamed the H120, in line with Airbus Helicopters' new H-labeled branding scheme.

The original final assembly line for the EC 120/H120 was located at Airbus Helicopters' facilities in Marignane, France. A second line was located in Harbin in the People's Republic of China, where HAI assembled H120s under the designation HC 120.

EC 120/H120s had also been assembled at Airbus Helicopters' Australian Aerospace subsidiary in Brisbane, Australia; Airbus Helicopters' Helibras

subsidiary in Itajuba, Brazil; and Airbus Helicopters Inc in Columbus, Mississippi.

Military Operators. The Spanish Air Force utilizes 15 H120s for ab initio pilot training. The H120 is particularly suited for military pilot training due to its size, its simple design, its large cabin visibility, and its ease of operability. In addition, it is possible to issue a report after each flight using information from the helicopter's Vehicle Engine Management Display (VEMD), an advantage for training flights.

The Indonesian Air Force operates 12 H120s, and the Indonesian Navy operates three. The Air Force's helicopters replaced Bell 47Gs in the training role. The Navy also uses its three H120s for training.

The Royal Singapore Air Force (RSAF) uses five H120s for pilot training. The helicopters are actually owned and maintained by Singapore Technologies Aerospace under the Public-Private Partnership (PPP) program of the Singapore Ministry of Defense. The Air Force itself conducts the training.

Thirty-six H120s are used for ab initio pilot training at the French Army Air Corps' light aviation flight school in Dax, France. The training is provided to pilots from all branches of the French armed forces, including the Gendarmerie Nationale.

The 36 H120s, deliveries of which were completed in October 2010, were acquired and are maintained by Helidax under a PPP initiative. Helidax is a joint venture of two companies, Defense Conseil International (DCI) and Babcock MCS France. The French government has an option to buy the H120s outright.

The Gabon Air Force acquired two H120s in 2012.

The Royal Malaysian Air Force took delivery of five H120s between late 2015 and mid-2017. The helicopters replaced Alouette IIIs in the basic rotary-wing training role. The five H120s are being leased for a period of six years from the Malaysian company Gading Kasturi Sdn Bhd, which also manages and maintains them.

The Myanmar Air Force commissioned four H120s in December 2016.

Diesel Power. In June 2011, Eurocopter teamed with Austro Engine and TEOS Powertrain Engineering on an effort to integrate a diesel engine on an H120 helicopter. The project was carried out under the auspices of the European Union's Clean Sky joint technology initiative.

Under the program, ground testing of a 442-hp diesel engine (called the AE440) began on an iron bird test article in November 2013. The iron bird, which was located at Airbus Helicopters' facilities in Marignane, incorporated an H120 airframe. Subsequently, an AE440 was installed on an H120 helicopter, and ground testing of the diesel-powered helicopter got underway in February 2015. Flight testing began in November 2015 and continued until July 2016.

Funding

All development financing was provided by the EC 120/H120 partners. Development costs had been estimated in 1991 (before the final redesign) at FRF915 million ($152 million).

Timetable

Month	Year	Major Development
	1988	Program announced
	1989	ASTA leaves program; Singapore Aerospace joins program; Program work shares/responsibilities assigned
	1989-1990	Feasibility and concept development studies conducted
Feb	1990	Three partners sign agreement on P.120L development
Sep	1991	Full-scale development begun
Jan	1993	EC 120 design revised to 1.5-tonne class
Jun	1995	First flight
Jun	1997	JAA certification awarded
Jan	1998	Initial delivery
Sep	2017	Production ends

Airbus Helicopters H120

Worldwide Distribution/Inventories

Military/Government Operators

(as of December 2017)

Operator	Designation	Quantity
China, People's Republic of, Army	HC 120	26
China, People's Republic of, Government	HC 120	1
France Army	H120	36
Gabon Air Force	H120	2
Germany Police	H120	6
Indonesia Air Force	H120	12
Indonesia Navy	H120	3
Lithuania Government	H120	2
Malaysia Air Force	H120	5
Mexico Federal Police	H120	5
Myanmar Air Force	H120	4
Nova Scotia Dept. of Natural Resources (Canada)	H120	1
Royal Canadian Mounted Police	H120	2
Singapore Air Force	H120	5
Spain Air Force	H120	15
Spain Police	H120	2
United States Customs and Border Protection	H120	20

Forecast Rationale

Airbus Helicopters ended production of the H120 in September 2017, after handing over the final aircraft that remained in the order backlog. The company is now focusing its efforts in the single-engine helicopter market on its larger H125 and H130 models. Airbus Helicopters will continue to support the global H120 fleet.

Production of the H120 in China by HAI, which builds the helicopter under the HC120 designation, is also being discontinued.

The H120 had faced intense competition in the entry-level segment of the light single turbine market. The Robinson R66 has dominated this sector in the past few years. Meanwhile, customer deliveries of Bell's new 505 Jet Ranger X began in March 2017. Further sales competition came from the Enstrom 480B and the Leonardo AW009. Customers in this portion of the rotorcraft market tend to be price-sensitive, and the H120 carried a higher price tag than those other four helicopters.

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