

## Denel Aviation AH-2 Rooivalk



### Description

Role: attack helicopter

Crew: 2 in tandem (pilot and weapon systems officer)

### Dimensions

Length: 18,731.64 mm (main rotor to tail rotor)

Fuselage length: 16.39 m

Height: 5.19 m

Rotor diameter: 15.58 m

### Weights

Empty: 5,190 kg

Maximum internal fuel: 1,469 kg

Maximum take-off: 8,750 kg

### Powerplant

Engines: 2 x Makila 1K2 turboshaft

Power: 1,716 kW (sea-level ISA) 30 s rating

### Performance

Maximum speed: 309 km/h

Combat range (internal fuel): 700 km

Ferry range (external fuel): 1130 km

Service ceiling: 20,000 ft

Maximum rate of climb: 13.3 m/s (twin-engined)

### Armament

Gun: 1 x 20 mm F2 dual-feed gas-operated cannon (400 or 700 high-velocity rounds)

Missiles: Includes 8 or 16 x [Mokopa](#) ZT-6 long-range anti-armour missiles, 4 x MBDA [Mistral Atam](#) air-to-air missiles, 36 or 72 x 70 mm [folding fin aerial rockets \(FFAR\)](#)

The **Denel Aviation AH-2 Rooivalk** is a latest generation attack [helicopter](#) manufactured by [Denel Aviation](#) of [South Africa](#). The name of the helicopter derives from the [Afrikaans](#) word for "Red Falcon".

The [South African Air Force](#) (SAAF) has ordered 12 Rooivalk AH-2As, the first of which entered service in July [1999](#). The helicopters are flown by [16 Squadron](#), which is based at [AFB Bloemspruit](#) near [Bloemfontein](#).

Due to the SAAF's decades of helicopter experience in the harsh African environment, the Rooivalk has been designed to operate in very basic surroundings for prolonged periods without sophisticated support. All that is needed to keep the Rooivalk flying is a medium transport helicopter equipped with a basic spares supply plus four groundcrew.

## **Missions**

The following types of missions are foreseen for the AH-2 Rooivalk:

- [Reconnaissance](#)
- Heliborne escort
- [Close air support](#)
- Deep penetration
- Anti-armour

## **External links**

- [Denel Aviation Official Rooivalk Site](#)
- [Aircraft.co.za - The Complete Aviation Reference](#)

## Eurocopter Colibri



**Eurocopter Colibri**

The **Eurocopter Colibri** (also designated as the Colibri EC 120 B) is a light (1.6 ton) single-engine [helicopter](#) manufactured by [Eurocopter](#).

The Colibri ([Spanish: \*hummingbird\*](#)) can carry up to 4 passengers in addition to the pilot, all in crash-resistant seats. It also has a crash-resistant fuel system.

The design of the Colibri's wide cabin (featuring excellent visibility) makes it suitable for wide variety of civilian and parapublic missions, such as utility transport, offshore transport, training, [law enforcement](#), casualty evacuation and corporate transport.

In the casualty evacuation role, the helicopter can carry one pilot and one stretcher patient as well as one or two medical attendants. For cargo carrying, the Colibri can carry one pilot plus 2.94 cubic meters of total useful load volume (cabin and hold).

The EC 120 B is mostly built from [composite materials](#) and has a Turbomeca Arrius 2F engine as well as a fenestron (shrouded) tail rotor, making it a particularly silent helicopter.

In addition to its civilian roles, the Colibri is also used by the military for training, observation and light utility missions. In the latter role, it can carry a sling load cargo of up to 700 kg.

The first EC 120 B was delivered in [1998](#) and by the end of [2002](#), Eurocopter had already delivered more than 300 Colibris to various customers.

[Official Eurocopter EC 120 B Website](#)

<b>Eurocopter Colibri EC 120 B</b>		
Eurocopter Colibri EC 120 B		
<b>Description</b>		
Role: light utility/transport helicopter		
Crew + passengers: 1/2 + 4/3		
<b>Dimensions</b>		
Length: 11.52 m (main rotor to tail rotor)		
Fuselage length: 9.60 m		
Height: 3.40 m		
Rotor diameter: 10.00 m		
<b>Weights</b>		
Empty: 960 kg		
Maximum internal fuel: 320.8 kg		
Maximum take-off: 1,715 kg		
<b>Powerplant</b>		
Engine: 1 x Turbomeca Arrius 2F turbine engine		
Power: 335 kW		
<b>Performance</b>		
Maximum speed: 150 kt (280 km/h)		
Maximum range (internal fuel): 771 km		
Service ceiling: >20,000 ft (6,100 m)		
Maximum rate of climb: 7.36 m/s		
<b>Payload</b>		
Maximum useful payload: 755 kg		
Maximum payload on external sling: 700 kg		

## Eurocopter Cougar



AS 532 Cougar

The **Eurocopter Cougar** is a twin-engined, medium-weight, multipurpose [helicopter](#) manufactured by Eurocopter.

The Cougar is a further development and upgrade of the [Aérospatiale Puma](#) in its militarized form. (Its civilian counterpart is the [Eurocopter Super Puma](#).)

### History

The AS 332 Super Puma, designed as a growth version to replace the [SA 330 Puma](#), first flew in [September 1977](#). It was fitted with two 1330kW [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.

### Variants

The current variants of the Cougar are:

#### AS 532 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 25 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 machine-guns.

#### AS 532 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 the following tasks:

- [Anti-surface unit warfare](#) (ASUW), fitted with AM 39 [Exocet](#) missiles.
- [Anti-submarine warfare](#) (ASW), fitted with a variable-depth sonar and torpedoes.
- Search and rescue.
- Sea patrols.

For deck landing, this variant can be fitted with a harpoon for quick securing.

### AS 535

French Army [Combat Search and Rescue](#) (CSAR or *RESCO* in French) version.

### EC 725

The EC725 is a long-range helicopter, powered by two Turbomeca [Makila 2A](#) turboshaft engines, that accommodates 2 crew members up to 29 troops.

Improvements on the EC725 in comparison with earlier models include modular design of the mechanical assemblies, use of composite materials, state of the art avionics, and a Vehicle Monitoring System.

Note: When Aérospatiale became part of Eurocopter, the following new designations were added:

- EC 225: Super Puma (civilian versions).
- EC 725: Cougar (military versions).

## Eurocopter Dauphin



The **Eurocopter Dauphin** ([Dolphin](#)) is a medium-weight multipurpose twin-engine helicopter manufactured by [Eurocopter](#) (originally by [Aérospatiale](#)).

The Dauphin is one of Eurocopter's most successful designs and is widely used as a corporate transport, police, news media, emergency medical services and search & rescue helicopter.

The military version of the Dauphin is the [Eurocopter Panther](#). The Dauphin is also used by the [United States Coast Guard](#) under the designation [HH-65 Dolphin](#).

The Dauphin is also manufactured in [China](#) under licence as the [Harbin Z-9 Haitung](#).

One of the distinctive features of the Dauphin is its fenestron tail rotor.

## History and Variants

The single engine SA 360 Dauphin and the twin engine SA 365C Dauphin 2 were developed by [Aérospatiale](#) as a replacement for its [Alouette III](#).

(Regarding the naming of the different variants, it should be noted that, until January [1990](#), the AS 365 models were designated as SA 365.)

### SA 360

The first prototype SA 360 A first flew on [2 June 1972](#) and was fitted with a 730 kW Turboméca Astazou XVI turboshaft. After 180 development flights, the engine was changed to a more powerful 785 kW Astazou XVIIIA. In order reduce vibration and to eliminate ground resonance, weights were also fitted to the rotor tips.

The first production aircraft - designated the SA 360 C - first flew in April [1975](#).

### SA 361

This version of the SA 360 was developed for so-called "hot and high" circumstances and was a more powerful variant with improved performance and a greater payload capability. The SA 361 was never series-produced, although some prototypes were built.

Prototypes of a military variant of the SA 361, the SA 361 H (equipped with up to eight HOT anti-tank missiles) were also built, but the type was likewise never series-produced.

### SA 365 C

This twin-engined version of the Dauphin, designated as the Dauphin 2, was announced in early [1973](#). The first flight of the first prototype took place on [24 January 1975](#), with production model deliveries starting in December [1978](#).

In comparison with the earlier model, the SA 365 C features twin Arriel turboshafts with a new engine fairing, a Starflex main rotor hub and a higher maximum takeoff weight.

Production of both the SA 360 and SA 365 C ceased in 1981, by which time approximately 40 SA 360s and 50 SA 365 Cs had been built. Both types were replaced by the SA 365 N1 (later designated the AS 365 N1).

### AS 365 N1

This is a much improved version of the SA 365C Dauphin 2, the first prototype flying on [31 March 1979](#). Deliveries of the production model began in [1982](#).

This version introduced the more powerful Arriel 1C turboshafts, enlarged tail surfaces, revised transmission, main rotor, rotor mast fairing and engine cowling as well as a retractable [tricycle undercarriage](#).

### **AS 365 N2**

(This version is currently still in production.)

This version introduced the upgraded Arriel 1C2 turboshafts, an improved gearbox, increased maximum take-off weight, redesigned cabin doors and a revised interior.

Deliveries of this version started in 1990.

### **AS 365 N3**



US Coast Guard Dolphin

(This version is currently still in production.)

This version was developed for so-called "hot and high" circumstances and has Arriel 2C turboshafts equipped with fully automated digital electronic control (FADEC). Production deliveries began in December [1998](#).

In [Australia](#), the [Victoria Police](#) Air Wing operates a number of Dauphin AS 365 N3's as well as SA 365C's.

### **EC 155 B1**

(This version is currently still in production.)

This version was originally known as the AS 365 N4, and was announced at the 1997 Paris Airshow.

As with the N3 version, it has twin Arriel 2Cs turboshafts equipped with FADEC as well as a five blade Spheriflex main rotor and a 40% larger main cabin (achieved with bulged doors).

The first flight of the first prototype took place on [17 June 1997](#).



## HH-65A Dolphin

The SA 366 G1 Dauphin version was selected by the [United States Coast Guard](#) (USCG) in the early 1980s as its new air-sea rescue helicopter and given the designation HH-65 Dolphin. In total 99 helicopters, optimised for the USCG's search and rescue role tasks, were acquired.

Some engineering changes were required to comply with U.S regulations, the most drastic probably being substituting the Turboméca engines by Textron (Avco Lycoming) LTS 101 units, in order to comply with local content (in terms of value) regulations.

## Military versions

For a more detailed discussion of the military versions of the Dauphin, see: [Eurocopter Panther](#).

Military AS 365 Ns are designated as AS 565 Panthers and are available in the following versions:

- AS 565 UA/UB: utility versions.
- AS 565 AA/AB: attack versions.
- AS 565 MA/MB: naval search & rescue versions.
- AS 565 SA/SB: ASW (Anti Submarine Warfare) versions.

## Production figures

More than 650 AS 365/366/565 versions have been produced or ordered, with the 500th Dauphin (counting all models) having been delivered in 1991. More than 20 EC 155s have been ordered.

## [Eurocopter Dauphin](#)



a Dauphin SA365F and some Alouette III of the 23S wing of the [French Navy](#) in the hangar of the St Mandrier base.



Dauphin SA365N SP (Public Service) of the detachment in Hyères of the 32F wing of the [French Navy](#)



Dauphin rescue helicopter on the deck of the [FS Charles de Gaulle](#) carrier (5th of June 2004)



[CHC Helicopter Dauphin](#)



## Eurocopter EC 135

The **EC 135** is a twin-engine civil helicopter produced by [Eurocopter](#), widely used amongst police and ambulance services, and for executive transport. It is capable of flight under [instrument flight rules](#) (IFR).

### Specifications (EC 135)

#### General characteristics

- **Crew:** one pilot
- **Capacity:** up to seven passengers
- **Length:** 12.16 m (39 ft 11 in)
- **Main rotor diameter:** 10.20 m (33 ft 6 in)
- **Height:** 3.62 m (11 ft 11 in)
- **Main rotor area:** 81.7 m<sup>2</sup> (880 ft<sup>2</sup>)
- **Empty:** 1,465 kg (3,230 lb)
- **Loaded:** 2835 kg ( lb)
- **Maximum takeoff:** 2,835 kg (5,997 lb)
- **Powerplant:** 2x [Turboméca Arrius 2B](#) turboshafts, 435 kW (583 shp) each or 2x Pratt & Whitney 206B turboshafts.

#### Performance

- **Maximum speed:** 259 km/h (162 mph)
- **Range:** 595 km (372 miles)
- **Service ceiling:** 3,045 m (10,000 ft)
- **Rate of climb:** 457 m/min (1,500 ft/min)
- **Main rotor loading:** kg/m<sup>2</sup> ( lb/ft<sup>2</sup>)
- **Power/Mass:** kW/kg ( hp/lb)

#### External link

- [EC 135 on manufacturer's website](#)
- [EC 135 in aeromedical services](#)

#### Related content

Related development: [MBB Bo 108](#)

Comparable aircraft: [Bell 427](#) - [MD Helicopters Explorer](#)

Designation sequence:

## Eurocopter Ecureuil



### Eurocopter Ecureuil AS 350 B2

#### Description

Role: light transport/utility helicopter

Crew + passengers: 1 + 6

#### Dimensions

Length: 12.94 m (main rotor to tail rotor)

Fuselage length: 10.93 m

Height: 3.34 m

Rotor diameter: 10.69 m

<b>Weights</b>
Empty: 1,220 kg
Maximum take-off: 2,250 kg
<b>Powerplant</b>
Engines: 1 x Turbomeca Arriel 1D1 turboshafts
Power: 546 kW
<b>Performance</b>
Maximum speed: 287 km/h
Range (internal fuel): 476 km
Service ceiling: 6,100 m
Maximum rate of climb: 11.1 m/s
<b>Payload</b>
Maximum payload: 2,500 kg
Maximum external payload on sling: 1,160 kg

The **Eurocopter Ecureuil** ([Squirrel](#)) is a single-engine helicopter manufactured by [Eurocopter](#). The North American version with Lycoming engines is named the **AStar**.

A twin-engined version was developed which is known as the **Ecureuil 2** or **Twin Squirrel** or in North American version the **Twin Star**.

Both single and twin-engined versions have been licenced built in Brazil.

### Variants (single-engined)

- **AS 350B**, powered by one [Turbomeca Arriel 1B](#) engine.
- **AS 350B1**, powered by one [Turbomeca Arriel 1D](#) engine.
- **AS 350B2**, higher gross weight version powered by one [Turbomeca Arriel 1D1](#) engine.
- **AS 350B3**, a high-performance version, is powered by a [Turbomeca Arriel 2B](#) engine equipped with a [Full Authority Digital Engine Control](#) (FADEC) system. On [May 14, 2005](#) an AS 350B3 landed and took off on [Mt. Everest](#) at the altitude of 8850 metres breaking the previous world record for highest altitude landing and take-off.
- **AS 350BA**, powered by a [Turbomeca Arriel 1B](#) engine.
- **AS 350BB**
  - **Eurocopter Squirrel HT1**, a military version of the *AS 350BB* for the British [RAF](#) as a training helicopter.
  - **Eurocopter Squirrel HT2**, a military version of the *AS 350BB* for the British [Army Air Corps](#) as a training helicopter.
- **AS 350C**, powered by one [Lycoming LTS-101-600A2](#) engine for the North American market as the *AStar*.
- **AS 350D**, powered by one [Lycoming LTS-101](#) engine for the North American market as the *AStar*.
- **AS 350L1**, military variant.
  
- **HB 350B Esquilo**, licence built in Brazil by Helibras.
- **AS 550C2 Fennec**, military version.
- **AS 550U2 Fennec**, militart version.

### Variants (twin-engined)

- **AS 355**, prototype known as **Ecureuil 2** or **Twin Squirrel**.
- **AS 355E**, North American version known as **Twin Star**.
- **AS 355F**
- **AS 355F1**
- **AS 355F2**
- **AS 355N** is fitted with two [Turbomeca Arrius 1A](#) engines and a FADEC system.
- **Eurocopter Twin Squirrel HCC1**, powered by Two [Allison 250-C20R](#) turboshafts, a military version of the *AS 355N* for the British [RAF](#) as a light transport helicopter.
- **AS.555N Fennec**, military version.
- **AS.555AF Fennec**, military version.
- **AS.555AN Fennec**, military version.
- **AS.555SN Fennec**, military version.
- **AS.555UN Fennec**, military version.
- **HB.355F Ecureuil 2**, licence built in Brazil by Helibras.

## Eurocopter Panther



The Panther helicopter of the *Cassard* frigate transferring a light load to the *Meuse*



Maneuvering of a *Panther* helicopter on the *Cassard* frigate

The **Eurocopter Panther** is the military version of the [Eurocopter Dauphin](#) medium-weight multipurpose twin-engine [helicopter](#) and is manufactured by [Eurocopter](#) (originally by [Aérospatiale](#)).

The Panther is a militarized version of the AS 365 N and has the type number AS 565.

## Versions

The Panther is available in the following versions:

- AS 565 UA/UB: utility versions. (Currently in production.) These versions are powered by two Turbomeca Arriel 2C [turbine engines](#), which are equipped with an full authority digital electronic control (FADEC). The main missions of this version are: transport of 8 to 10 fully-equipped troops, casualty evacuation and logistic support.
- AS 565 AA/AB: attack versions. (Not currently in production.)
- AS 565 MA/MB: naval search & rescue versions. (Currently in production.) This is the navalized version of the Panther and is also powered by two Turbomeca Arriel 2C turbine engines equipped with FADEC. The main missions of this version are: [anti-surface vessel warfare](#) (ASuW), [anti-submarine warfare](#) (ASW) and [search and rescue](#) (SAR). This version is fitted with the quick-securing "Harpoon" device that allows it to land and take off on board ships whatever the relative wind direction.
- AS 565 SA/SB: ASW (Anti Submarine Warfare) versions. (Not currently in production.)
- AS 565 CA: Anti-tank version, armed with HOT missiles.

## Armament

The armament of the various versions can include:

- Giat M621 20 mm cannon pods.
- Matra [Mistral](#) air-to-air [missiles](#).
- [HOT](#) anti-tank missiles.
- 68 mm and 70 mm unguided [rockets](#).
- AS.15TT anti-surface missiles.
- Anti-submarine warfare [torpedoes](#).

## Eurocopter Super Puma



Eurocopter Super Puma operated by [CHC Helicopter](#)

The [Eurocopter Super Puma](#) (originally built by [Aérospatiale](#)) is a [helicopter](#) marketed for civil and military use. It is an enlarged and re-engined version of the original [Aérospatiale Puma](#) and first flew on [September 13 1978](#).

The type has proved immensely successful, chosen by 37 military forces around the world, and some 1,000 civil operators. The Super Puma has proved especially well-suited to the North Sea oil industry, where it is used to ferry personnel and equipment to and from oil platforms. In civilian configuration it can seat approximately 18 passengers and two crew. The world's largest civilian fleet (48) of Super Puma helicopters is operated by [CHC Helicopter Corporation](#).

A wide variety of specialised military variants are in use, including dedicated [SAR](#) and [ASW](#) versions. Since [1990](#), military Super Pumas have been marketed as the [Cougar](#).

### Specifications (AS 332L1)

### General Characteristics



📏 Eurocopter Super Pumas of [Cougar Helicopters](#)

- **Crew:** one or two pilots
- **Capacity:** up to 24 passengers
- **Length:** 16.29 m (53 ft 5 in)
- **Main rotor diameter:** 15.6 m (51 ft 2 in)
- **Height:** 4.6 m (15 ft 1 in)
- **Main rotor area:** 191 m<sup>2</sup> (2,056 ft<sup>2</sup>)
- **Empty:** 4,460 kg (9,812 lb)
- **Loaded:** kg ( lb)
- **Maximum takeoff:** 8,600 kg (18,940 lb)
- **Powerplant:** 2x [Turboméca Makila](#) 1A1 turboshaft engines, 1,357 kW (1,819 shp) each

## Performance

- **Maximum speed:** 278 km/h (174 mph)
- **Range:** 831 km (519 miles)
- **Service ceiling:** 7,200 m (19,750 ft)
- **Rate of climb:** 492 m/min (1,614 ft/min)
- **Main rotor loading:** kg/m<sup>2</sup> ( lb/ft<sup>2</sup>)
- **Power/Mass:** kW/kg ( hp/lb)



## Eurocopter Tiger

Description	
Role	Attack helicopter
Crew	2 (pilot & weapon systems officer)
Dimensions	
Length	15.80m (main rotor to tail rotor)
Fuselage length	14.08 m
Height	3.83 m (HAP); 5.20 m inc. mast-mounted sight (UHT)
Rotor diameter	13.00 m
Weights	
Empty	3,060 kg
Max. internal fuel	1,080 kg
Max. take-off	6,000 kg
Powerplant	
Engines	2 x Rolls-Royce / Turboméca / MTU <a href="#">MTR390</a> turboshafts
Power	873 kW
Performance	
Max. speed	280 km/h

Combat range (internal fuel)	800 km
Ferry range (external fuel)	1300 km
Service ceiling	4,000 m
Max. rate of climb	10.7 m/s
<b>Armament</b>	
Guns	1 x 30 mm cannon in chin turret (HAP,HAD,ARH) 1 x 12.7 mm or 20 mm gun in pod (UHT)
Missiles	8 x <a href="#">Trigat</a> and/or <a href="#">HOT3</a> (UHT,HAD) or <a href="#">Hellfire II</a> (ARH) Antitank-missile 4 x <a href="#">Stinger</a> Air-Air-missile (UHT,ARH) outside 4 x <a href="#">Mistral</a> Air-Air-missile (HAP,HAD) outside
Rockets	2 pods of 19 70mm unguided missile <a href="#">SNEB</a> (UHT,HAD) or <a href="#">Hydra</a> (ARH) inside 2 pods of 22 68mm unguided missile <a href="#">SNEB</a> (HAP) inside 2 pods of 7 70mm unguided missile <a href="#">SNEB</a> (HAD) or <a href="#">Hydra</a> (ARH) outside 2 pods of 12 68mm unguided missile <a href="#">SNEB</a> (HAP) outside

The **Eurocopter Tiger** is an attack [helicopter](#) manufactured by the [Eurocopter Group](#). In [Germany](#) it is known as the **Tiger**; in [France](#) it is called the **Tigre**. It is also designated the **EC 665** or **PAH-2**.

## History

In [1984](#) the [French](#) and [German](#) governments issued a requirement for an advanced multi-role battlefield [helicopter](#). A joint venture consisting of [Aerospatiale](#) and [MBB](#) was subsequently chosen as the preferred supplier.

Due to high costs, the program was canceled in [1986](#), but was relaunched during [1987](#).

Subsequently, in [November 1989](#), Eurocopter received a contract to build 5 prototypes. Three were to be unarmed testbeds and the other two armed prototypes: one for the German anti-tank variant and the other for the French escort helicopter variant.

The first prototype first flew in [April 1991](#). When Aerospatiale and MBB, among others, merged in [1992](#) to form the Eurocopter Group, the Tiger program was transferred as well.

The helicopter's first major public appearance was in the [1995 James Bond](#) film [GoldenEye](#), where the theft of a prototype was a major plot point.

Serial production of the Tiger began in [March 2002](#) and the first flight of the first production Tiger HAP for the French Army took place in March [2003](#). The delivery of the first of the eighty helicopters ordered by the French took place in [September](#) 2003.

The deliveries of the 80 UHT version combat support helicopters ordered by Germany also began at the end of 2003 to the Federal Office of Defense Technology and Procurement.

In [December 2001](#) Eurocopter was awarded the contract for the Australian Army's "Air 87 Requirement", which was for 22 helicopters of the Tiger ARH (Armed Reconnaissance Helicopter) version. The first Tiger ARH is scheduled to enter service in [2004](#). Some local assembly and production will also take place.

In September 2003, Spain selected a variant of the Tiger HAP combat support helicopter - the Tiger HAD - for its army. The 24 helicopters of this type that have been ordered will be armed with the [Trigat](#) and [Mistral](#) missile systems. They will also have an updated Enhanced MTR390 engine and a heavier payload. Deliveries are scheduled for [2010](#) - [2014](#). France opted to upgrade most of its HAP Helicopter to HAD; so the HAC-Variant will never build.

## Versions

It should be noted that, while the Tiger has a conventional helicopter gunship configuration of the two crew sitting in tandem, it is somewhat unusual in that the pilot is in the front seat and the gunner is in the back, unlike all other production attack helicopters. As a consequence, the seats are offset to opposite sides of the centerline to improve the view forward for the gunner in the back.

## Tiger HAP

The Tiger HAP/HCP (i.e. *Helicoptere d'Appui Protection* or *Helicopter for Close Protection*) is a medium-weight air-to-air combat and fire support helicopter built for the French Army.

It is fitted with a 30 mm chin-mounted gun turret and 68 mm [SNEB](#) unguided rockets for the fire support role as well as [Mistral](#) air-to-air missiles.

## UH Tiger

The UHT (i.e. *Unterstützungshubschrauber Tiger*) is a medium-weight multi-role fire support helicopter built for the German Army.

The UHT can carry [Trigat](#) "fire and forget" and/or [HOT3](#) anti-tank missiles as well as 70 mm [SNEB](#) air-to-ground fire support rockets. 4 [AIM-92 Stinger](#) missiles (2 on each side) are mounted for air-to-air combat. Unlike the HAP/HCP version it has no integrated gun turret, but a 12.7 mm gunpod can be fitted if needed. The [Bundeswehr](#) decided against the GIAT cannon (french 30mm cannon that is used on other Tiger versions), because of too much recoil. Probably the UHT's will be upgraded later with a recoilless 30mm auto-cannon by Rheinmetall (RMK 30).

Another noticeable difference with the HAP version is the use of a mast-mounted sight which has a second-generation infrared channel and a TV channel. Countermeasures include radar/laser/missile launch/missile approach warning receivers and decoy launchers.

## Tiger ARH

The Tiger ARH (Armed Reconnaissance Helicopter) is the version used by the Australian Army. The Tiger ARH is a modified and upgraded version of the Tiger HAP with upgraded MTR390 engines as well as a laser designator incorporated in the Strix sight for the firing of [Hellfire II](#) air-to-ground missiles. Instead of the [SNEB](#) unguided missile, the ARH use the [Hydra](#) unguided missile of the Apache.

## Tiger HAD

The Tiger HAD version is essentially identical to the HAP version, but with 14% more engine power available due to the upgraded Enhanced MTR390 engines and a better ballistic protection. It can also be equipped with the [Trigat](#) anti-tank missiles that were originally developed for the German UHT version.

The helicopter is suited for a support and fire suppression role and has been selected to equip the Spanish Army. The French Army Air Corps (ALAT) decide to upgrade most of their HAP Helicopter to the HAD-Variant and so the formerly HAC Variant (i.e. *Hélicoptère Anti-Char* or Helicopter Anti-Tank) was cancelled.

## Users and Cost

The Tiger is used or will be used by the following countries:

- [Germany](#): 80 aircraft - all of the UHT version.
- [France](#): 80 aircraft - 40 HAP and 40 HAD
- [Spain](#): 24 aircraft of the HAD version.
- [Australia](#): 22 aircraft of the ARH version.

The system cost (helicopter, armament, support) depends on number and version: 2002 Spain was submitted an offer about 28/20 helicopters.

- Tiger HAP 35/39 Mio Dollar
- Tiger ARH 36 Mio Dollar
- Tiger HAD 44/48 Mio Dollar
- Tiger UHT 38/43 Mio Dollar
- (Comparison [Apache Longbow](#) 48/52 Mio Dollar)

## *Eurocopter Tiger*

Australian Army



## Eurocopter BO 105



[Canadian Coast Guard](#) BO-105 helicopters

The German **BO 105** is a light twin engine multi purpose utility [helicopter](#) initially developed by Bölkow, and then built by Messerschmidt-Bölkow-Blohm (MBB) which is now belonging to the [Eurocopter Group](#).

Being the first light twin-engined helicopter in commercial service, it gained widespread use over rural areas ([police](#) and [EMS](#) / [medevac](#)) as well as offshore.

The four-blade hingeless main [rotor](#) with composite blades ensures high maneuverability. All main systems (hydraulics, electric, fuel, lubrication) were designed to be fully redundant.

Military variants include light transport, reconnaissance and antitank versions and were (and/or still are) used by [Germany](#), [Spain](#), [Indonesia](#), [Netherlands](#), [Philippines](#), [Brunei](#), [Mexico](#), [Sweden](#), [Peru](#), [Nigeria](#) and others.

The variants used by the German Army are the Bo105-P and Bo105-M.

**Bo105-P** with its army designation "PAH-1" and "PAH-1A1" for the upgraded version (PAH=**P**anzer**a**bwehr**h**ubschrauber; 'Tank-defence helicopter'), is an anti-tank helicopter armed with wire-guided HOT ATGMs (HOT2 for the upgraded A1 version). Most of them are being replaced with the new UH Tiger multirole attack helicopter, some will still stay in service till the end of their life span. The outphased PAH's are going to be disarmed and downgraded to the VBH version.

**Bo105-M** with its army designation "VBH" (**V**er**b**indungs**h**ubschrauber; 'connection chopper'), is a light transport and surveillance helicopter. They were outphased and replaced by disarmed and modified PAH1.

## Euromil Mi-38

The **Euromil Mi-38** is a cargo helicopter designed by [Mil](#) but being developed and marketed by an international consortium. It was originally intended as a replacement for the [Mi-8](#) and partly [Mi-6](#). It is being marketed in both military and civil versions. Flew for the first time on the 22nd of december 2003.

### Specifications (Mil-38)

#### General characteristics

- **Crew:** two
- **Capacity:** 32 passengers or 6,000 kg (13,200 lb) of cargo
- **Length:** 19.70 m (64 ft 8 in)
- **Main rotor diameter:** 21.10 m (69 ft 3 in)
- **Height:** 5.13 m (16 ft 10 in)
- **Main rotor area:** 349.5 m<sup>2</sup> (3,762 ft<sup>2</sup>)
- **Empty:** 8,300 kg (18,300 lb)
- **Loaded:** 14,200 kg (31,300 lb)
- **Maximum takeoff:** 15,600 kg (34,400 lb)
- **Powerplant:** 2x [Pratt & Whitney Canada PW127](#) turboshafts, 1,865 kW (2,500 shp) each

#### Performance

- **Maximum speed:** 275 km/h (171 mph)
- **Range:** 1,300 km (811 miles)
- **Service ceiling:** 6,500 m (21,320 ft)
- **Rate of climb:** m/min ( ft/min)
- **Main rotor loading:** 41 kg/m<sup>2</sup> (8.3 lb/ft<sup>2</sup>)
- **Power/Mass:** 0.26 kW/kg (0.16 hp/lb)

#### External links

- <http://www.aviation.ru/Mi/#38>

[\[edit\]](#)

#### Related content

Related development:

Comparable aircraft: [EH Industries EH101](#) - [Sikorsky S-92](#)

Designation sequence: [Mi-34](#) - [Mi-35](#) - [Mi-36](#) - **Mi-38** - [Mi-40](#) - [Mi-42](#) - [Mi-44](#)

## Focke-Wulf Fw 61



The Focke-Wulf Fw 61.

The **Focke-Wulf Fw 61** was the first fully controllable [helicopter](#). It first flew in [1934](#).

Prof. Heinrich Focke and engineer Gerd Achgelis started the design for this helicopter in 1932. The airframe was based on that of a well-tried training aircraft. A single engine drove twin rotors, to the left and right of the fuselage. Only a prototype was produced (by [Focke-Wulf](#)). In 1936 it was demonstrated by [Hanna Reitsch](#) in [Berlin, Germany](#). It achieved an altitude of nearly 8000 feet (2400 m), a speed of 76 mph (122 km/h) a flight duration of 80 minutes and a distance of over 50 miles (80 km).

### Specifications (Fw 61)

### External links

- <http://www.return2style.de/swingaring/amifw61.htm>
- [Virtual Aviation Museum](#)
- [Warbirds Resource Group](#)



## H-19 Chickasaw



### Description

Role	Multi-purpose helicopter
Crew	2 (pilot, copilot) + 12 troops or 8 litters

### Dimensions

Length	62 ft 7 in (overall) 42 ft 2 in (fuselage)	19.1 m 12.85 m
Width (Fuselage)		
Height	13 ft 4 in	4.07 m
Rotor diameter	53 ft	16.16 m

### Weights

Empty	4,795 lb	2,177 kg
Loaded	7,200 lb	3,266 kg
Maximum take-off	7,900 lb	3,587 kg

### Powerplant

Engines	1 <a href="#">Pratt &amp; Whitney R-1340-57</a> radial piston	
Power	600 hp	450 kW

### Performance

Maximum speed	101 mph	163 km/h
Combat range		
Ferry range	405 mi	652 km
Service ceiling	10,500 ft	3,200 m
Rate of climb	700 ft/min	213 m/min

### Armament

Guns	
Bombs	

The **Sikorsky UH-19 Chickasaw** (formerly known as **H-19**, outside the US by its manufacturer's designation as **S-55**) was a multi-purpose [helicopter](#) used by the [United States Army](#). It was also licensed to [Westland Aircraft](#) and manufactured as the [Westland Whirlwind](#) in the [United Kingdom](#). [US Navy](#) and [Coast Guard](#) models were designated **HRS**, while those of the [Marine Corps](#) were **HO4S**.

The H-19's first flight was on [November 10, 1949](#) and it entered operations in [1950](#). Over 1,000 of the helicopters were manufactured by [Sikorsky](#) for the [United States](#). An additional 550 were manufactured by licensees of the helicopter including Westland Aircraft, [Sud-Est](#) in [France](#) and [Mitsubishi](#) in [Japan](#).

The helicopter was widely exported, used by many other nations, including [Israel](#), [Chile](#) and [Turkey](#).



H-19 at [National Museum of the United States Air Force](#), showing unusual mounting of engine

### Combat Experience

The H-19 underwent live service tests during the [Korean War](#) beginning in [1951](#). Undergoing tests such as [medical evacuation](#), tactical control and front-line cargo support, the helicopter succeeded admirably in surpassing the capabilities of the [H-5 Dragon Fly](#) which had been used throughout the Korean conflict by the Army.

The H-19 was also used in the early days of the [Vietnam War](#) before being supplanted by the [H-34 Choctaw](#), which was based on the H-19.

### Civilian use

[New York Airways](#), founded in [1949](#), used modified Sikorsky S-55 to carry mail and cargo. Later they used helicopters designed specifically for the civilian market.

Related content	
<b>Related Development</b>	
<b>Similar Aircraft</b>	
<b>Designation Series</b>	<a href="#">H-16</a> - <a href="#">H-17</a> - <a href="#">H-18</a> - <b>H-19</b> - <a href="#">H-20</a> - <a href="#">H-21</a> - <a href="#">H-22</a> <a href="#">S-52</a> - <a href="#">S-53</a> - <a href="#">S-54</a> - <b>S-55</b> - <a href="#">S-56</a> - <a href="#">S-57</a> - <a href="#">S-58</a>

## H-23 Raven



The four-place **Hiller H-23 Raven** light observation [helicopter](#) was based on the [United States Navy](#) UH-12, which was first flown in [1948](#). The H-23 Raven performed as a utility, observation, and MedEvac helicopter during the [Korean war](#). Model numbers ranged A through D, F and G. The H-23A had a sloping front windshield. The H-23B was used as a primary helicopter trainer. Beginning with the UH-23C, all later models featured the "Goldfish bowl" canopy similar to the Bell model 47, and also featured the Bell-designed short weighted gyro-stabilizer bar. The OH-23 had a speed of 97 mph (84 knots). The Raven had a two-bladed main rotor, a metal two-bladed tail rotor. Both the OH-23B and the OH-23C were powered one O-335-5D engine.

The OH-23D was a purely military version with a O-435-23C engine and a more reliable transmission. Most OH-23Ds were replaced by the OH-23G, the most common version of the Raven, with a more powerful Lycoming O-540-9A six-cylinder, horizontally opposed, air cooled 305 hp engine. The OH-23G could seat four. The MedEvac version carried two external skid-mounted litters or pods. The Raven saw service as a scout during the early part of the Vietnam war before being replaced by the OH-6A Cayuse in early 1968. The Raven could be armed with twin M37C .30 Cal. machine guns on the XM1 armament subsystem or twin M60C 7.62mm machine guns on the M2 armament subsystem. The XM76 sighting system was used for sighting the guns.

## SH-3 Sea King



*Several UH-3 Sea Kings taking off*

### Description

Role	Multi-role helicopter
Crew	4 (2 pilots, 2 <a href="#">ASW</a> systems operators)

### Dimensions

Length	54 ft 9 in (fuselage)	16.7 m
Width		
Height	16 ft 10 in	5.13 m
Rotor diameter	62 ft	19 m

### Weights

Empty	11,865 lb	5,382 kg
Loaded (ASW)	18,626 lb	8,449 kg
Maximum take-off	22,050 lb	10,000 kg

### Powerplant

Engines	2 <a href="#">General Electric</a> T58-GE-10 turboshaft	
Power	1,400 shp (each)	

### Performance

Maximum speed	166 mph	267 km/h
Combat range		
Ferry range	621 mi	1,000 km
Service ceiling	14,700 ft	4,481 m
Rate of climb	1,310-2,220 ft/min	400-670 m/min

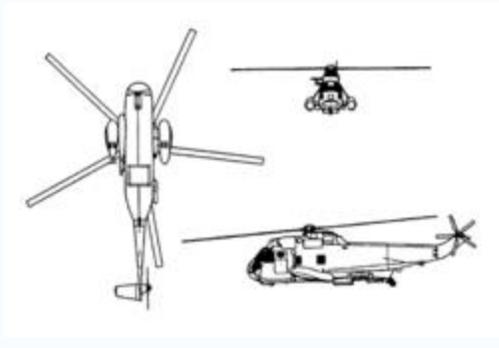
### Armament

Guns	Some variants with door guns
Torpedoes	2 Mk 46 <a href="#">torpedoes</a> (on SH-3H)
Defensive	Chaff Pod (on SH-3H)

The **Sikorsky UH-3 Sea King** (also known as **Sikorsky S-61**) is a twin-engined multi-purpose [helicopter](#). It served with the [United States Navy](#) and other forces, and in many countries around the world.

## Overview

Designed by [Sikorsky](#), the Sea King first flew in [1959](#), and was operational with the [United States Navy](#) in [June 1961](#) as the **HSS-2**. The designation for the aircraft was changed with the introduction of the unified aircraft designation system in [1962](#) to the **H-3**. It was intended from the start to be used for shipboard operations (e.g., the five-bladed rotors can be folded for easy stowage). It was used primarily for [anti-submarine warfare](#), but also served in anti-ship, [search and rescue](#), transport, communications, executive transport and [Airborne Early Warning](#) roles. In the US Navy it was replaced in the ASW and S&R roles by the [SH-60 Sea Hawk](#) during the [1990s](#), but continues in service for other roles, for ASW in the reserves, and around the world. All H-3 aircraft still in U.S. Navy service are used in the logistics support, range support, Search and Rescue, test, and VIP transport roles.



The [Westland Sea King](#) variant was manufactured under license by [Westland Helicopters](#), Ltd. in the [United Kingdom](#), who developed a specially modified version for the [Royal Navy](#). It is powered by a pair of British [Rolls-Royce](#) Bristol Gnome turbines, and has British avionics and ASW equipment. This variant first flew in [1969](#), and entered service the next year. It was also used by the [Royal Air Force](#) and has been sold round the world. Aircraft were also manufactured under license in Japan.

Countries to which the Sea King has been exported include [Argentina](#), [Australia](#), [Belgium](#), [Brazil](#), [Canada](#), [Egypt](#), [Germany](#), [India](#), [Japan](#), [Malaysia](#), [Norway](#), [Pakistan](#), [Peru](#), [Qatar](#), [Spain](#) and the [United Kingdom](#).

Armaments and equipment of Sea Kings vary widely with their role. Typical armaments can be four torpedoes, four depth charges or two anti-ship missiles ([Sea Eagle](#) or [Exocet](#)). A large [Chaff](#) Pod was sometimes carried for anti-ship missile defense of the [Carrier Battle Group](#). ASW equipment included a dipping [sonar](#), [sonobouys](#), [Magnetic Anomaly Detector](#), and [Data link](#). In the Search and Rescue role the cabin can accommodate 22 survivors or nine stretchers and two medical officers. In the troop transport role 28 soldiers can be accommodated.

Due to its [amphibious hull](#), the Sea King has the ability to land on [water](#). However, this is a risky maneuver and used only in [emergencies](#), as the hull can only remain [watertight](#) for a few minutes. The sponsons were fitted with deployable airbags to enhance floatation.

A "Sea King" is used as the official helicopter of the [President of the United States](#), operated by the [United States Marines](#). It is known as "[Marine One](#)" when The Chief is actually aboard.

## Canadian Experience



Canadian Navy CH-124 Sea King

The [Royal Canadian Navy](#) was authorized to purchase 41 Sea King models in [1963](#), designating them **CH-124**. The helicopters at that time were state of the art and served well, being well liked by crews. The RCN developed a technique for landing the huge helicopters on small ship decks, using a 'hauldown' winch (called a 'bear trap'), earning aircrews the nickname of 'Crazy Canucks'. In [1968](#), the RCN, [RCAF](#) and [army](#) unified to form the [Canadian Armed Forces](#); air units were dispersed throughout the new force structure until [Air Command](#) (AIRCOM) was created in [1975](#).

As the Sea Kings' air frames, engines and avionics systems aged over their years of service in the RCN, and later AIRCOM, they became increasingly unreliable and harder to maintain. Twelve have crashed, killing ten personnel. Each Sea King now requires over 30 hours of maintenance for every hour of flying time, a figure described by the Canadian Naval Officers Association as 'grossly disproportionate' [\[1\]](#). The helicopters are unavailable for operations 40% of the time and due to the fact that the airframes are 10-15 years older than other Sea Kings flying in allied air forces, AIRCOM is frequently forced to have spare parts custom-made as Sikorsky's supplies are either overly expensive or no longer exist. AIRCOM's Sea Kings are now widely perceived as unreliable, outdated and expensive to maintain, by observers both inside and outside the Canadian Forces. In late [2003](#) the entire fleet was grounded (except for essential operations) for several weeks after two aircraft coincidentally lost power within a few days of each other.

Efforts by AIRCOM to find a replacement for the helicopters have been hampered by political considerations. In [1987](#) the [Progressive Conservative](#) government announced the purchase of 48 [EH-101](#) helicopters to replace both the *CH-124 Sea King* and [CH-113 Labrador](#) fleets at a cost of \$4.4 billion (CAD). Two variants of the EH-101 were being considered, with 33 *CH-148 Petrel* ship-borne anti-submarine models and 15 *CH-149 Chimo* variants for maritime and Arctic search and rescue. In [1992](#), just as the contract was to be finalised, the same government announced that the actual order was being reduced to 28 Petrels and 15 Chimos.

However, following a change of government in [October 1993](#) the incoming [Liberals](#) ordered AIRCOM to immediately cancel the entire order, forcing the payment of cancellation fees of \$500 million (CAD). When it subsequently became clear that new helicopters were still desperately needed to replace AIRCOM's *CH-124 Sea King* fleet, the Liberal government began a tortured procurement process that critics have accused of being deliberately tailored to prevent the EH-101 from being chosen as a candidate. The Liberal leader, [Prime Minister Jean Chrétien](#) had disparagingly referred to the EH-101 as a 'Cadillac' during a time of government restraint and deficit fighting.



[CHC Helicopter](#) Sikorsky S-61N

It was only after Chrétien's retirement in [December 2003](#) that the competition was finally re-opened. In [July](#) of [2004](#), it was announced that the Sea Kings will be replaced by the new [Sikorsky H-92](#), carrying a [General Dynamics](#) mission package, with the first of 28 models designated the *CH-148 Cyclone* scheduled for delivery in [2008](#).

There has been some controversy with the choice of the H-92. After the original EH-101 order was cancelled, AIRCOM was still desperate for a replacement for the *CH-113 Labrador* as a maritime/Arctic search-and-rescue helicopter, as these airframes were of a similar age to the *CH-124 Sea King* fleet and there had been several high-profile fatalities among aircrew. As search and rescue aircraft were much more palatable to the peaceable ideological leanings of Chrétien's administration during a time of zealous budget cuts to the [Department of National Defence](#), the government authorized AIRCOM to acquire 15 civilian EH-101s that lacked the warfighting capability of the ship-borne anti-submarine version of the EH-101; in other words a very similar model to the original *CH-149 Chimo* proposal from [1987](#) and [1992](#) respectively, however these 15 EH-101s have been carefully renamed the *CH-149 Cormorant* to avoid reference to the original EH-101 controversy.

The fact that the EH-101 air frame won this much smaller competition for replacing the *CH-113 Labrador* caused considerable embarrassment for the Liberal government because AIRCOM had selected the very aircraft which the government had claimed was too extravagant while an opposition party, and which they had cancelled at a cost of \$0.5 billion CAD shortly after assuming power as the government.

Critics have also claimed that by selecting the smaller two-engine H-92 to replace the *CH-124 Sea King*, as opposed to the supposedly more capable three-engine EH-101, for its ship-borne anti-submarine helicopters, Canada has lost the opportunity to have a single air frame, engine model and avionics package for land-based search and rescue and shipborne anti-submarine operations. Advantages would have included elimination of duplicate aircrew and maintenance training for multiple airframe models, as well as standardising parts supplies.



[Irish Coast Guard](#) S-61 (operated by [CHC Helicopter](#))

Canadian Sea King pilots have composed a 'theme song' for their service, sung to the tune of the [1970s](#) pop hit [Seasons in the Sun](#) beginning

Goodbye papa, please pray for me  
My helicopter's crashing in the sea.

The chorus runs

We had joy, we had fun, we had Sea Kings in the sun  
But the engines are on fire and the Sea Kings must retire.

### H-3 Variants



An H-3 Sea King during [Apollo 17](#) recovering operations, with the [USS Ticonderoga](#) in the background

- S-61 -- Company designation for the H-3 Sea King.
- AS-61 -- Company designation for the H-3 Sea King built under licence in Italy by Agusta.
- S-61A -- Military transport, search and rescue helicopter. Export version of the SH-3A Sea King.
- S-61A-4 Nuri -- Military transport, search and rescue helicopter for the Royal Malaysian Air Force. It can seat up to 31 combat troops.
- AS-61A-4 -- Military transport helicopter, search and rescue helicopter. Built under licence in Italy by Agusta.
- S-61B -- Company designation for the SH-3 [anti-submarine warfare](#) helicopter.
- S-61D-4 -- Export version for the Argentine Navy.
- S-61L -- Non-amphibious civil transport version. It can seat up to 30 passengers.
- S-61L Mk II -- Improved version of the S-61L helicopter.
- S-61N -- Amphibious civil transport version.
- S-61N Mk II -- Improved version of the S-61N helicopter.
- S-61R -- Military transport helicopter. Designated *CH-3C* by the US Air Force.
- AS-61R (HH-3F Pelican) -- Long-range search and rescue helicopter. Built under licence in Italy by Agusta.
- AS-61VIP -- VIP transport helicopter. Built under licence in Italy by Agusta.
- ASH-3A (SH-3G) -- Utility transport helicopter. Built under licence in Italy by Agusta.
- HH-3A -- Search and rescue helicopter for the US Navy.



- RH-3A -- Minesweeper helicopter for the US Navy.
- SH-3A (HSS-2) -- [Anti-submarine warfare](#) helicopter for the US Navy.
- VH-3A -- VIP transport helicopter for the US Marine Corps.
- CH-3B -- Military transport helicopter for the US Air Force.
- CH-3C -- Long-range military transport helicopter for the US Air Force.
- ASH-3D -- [Anti-submarine warfare](#) helicopter. Built under licence in Italy by Agusta.
- SH-3D (HSS-2A) -- [Anti-submarine warfare](#) helicopter for the US Navy.
- VH-3D -- VIP transport helicopter for the US Marine Corps.
- CH-3E -- Long-range military transport helicopter for the US Air Force.
- HH-3E Jolly Green Giant -- Long-range search and rescue helicopter for the US Air Force.
- HH-2F Pelican -- Long-range search and rescue helicopter for the US Coast Guard.
- SH-3G -- Cargo, utility transport helicopter for the US Navy.
- ASH-3H -- [Anti-submarine warfare](#) helicopter. Built under licence in Italy by Agusta.
- SH-3H (HSS-2B) -- [Anti-submarine warfare](#) helicopter for the US Navy.
- UH-3H -- cargo
- ASH-3TS -- VIP, [executive transport mission](#) helicopter. Built under licence in Italy by Agusta.
- CH-124 -- [Anti-submarine warfare](#) helicopter for the Canadian Armed Forces.
- YHSS-2 -- Prototype and trials aircraft. Seven helicopters were built for the US Navy.
- XHSS-2 -- The one and only prototype of the H-3 Sea King.

### H-3 Specifications



[Royal Navy](#) Sea King

### Accommodation

- SH-3H/D -- Crew of four (two pilots, two sensor operators) and three passengers
- UH-3H/SH-3G -- Up to 15 passengers

### Armament

- 2 x MK-46/44 anti-submarine torpedoes
- Various sonobouys and pyrotechnic devices
- [B-57](#) Nuclear depth charge

## Performance

- SH-3D/H helicopters are capable of airspeeds up to 120 KIAS for 3.5-5.5 hours, 12+ hours with inflight (hover) refueling from escort ships.

## Powerplant

- SH-3H/UH-3H: 2 x [General Electric](#) T-58-GE-402 turboshaft engines -- 1,500 shaft horsepower (1100 kW) each.
- SH-3D: 2 x General Electric T58-GE-10 turboshaft engines -- 1,400 shaft horsepower (1000 kW) each.
- SH-3G: 2 x General Electric T58-GE-8F turboshaft engines -- 1,250 shaft horsepower (900 kW) each.
- Westland: two Rolls Royce Gnome (Mks. 1 & 2 H1400-1, Mk. 4 onwards H1400-2) free power turbines - 1200 kW (1,600 shaft horsepower each).

## External links

### Sikorsky H-34 Choctaw



The **Sikorsky H-34 Choctaw** (also known as Sikorsky S-58) was a helicopter originally designed for the [US Navy](#) for service in the [ASW](#) role. It was developed from the [Sikorsky UH-19 Chickasaw](#). It is a utility transport helicopter, with no armament on board.

It was powered by a single [Wright R-1820-84 radial engine](#), and could carry 12 to 16 troops, or eight [stretchers](#) if utilized in the [MedEvac](#) role.

The aircraft first flew on [March 8, 1954](#). Initially designated HSS *Seabat* by the Navy and HUS *Seahorse* by the [Marines](#), in [1962](#) all services adopted the [Army](#) designation, H-34 *Choctaw*. In 1962 under the unified system, the *Seabat* was redesignated **SH-34**, the *Seahorse* as the **UH-34**, and the *Choctaw* as the **CH-34**.

It was also built and developed under license in the [United Kingdom](#) by [Westland](#) as the [Wessex](#). US production ceased in [1970](#) with 1,800 built.

### Specifications (H-34 Choctaw)

- Max Speed: 107 kt / 123 mph
- Max Range: 293 km / 182 miles
- Dimensions: main rotor diameter 17.07 m / 56 ft 0 in, length 17.28 m / 56 ft 8.5 in, height 4.85 m / 15 ft 11 in
- Weight: empty 3,583 kg / 7,900 lb, maximum take-off 6,350 kg / 14,000 lb

### HAL Dhruv



Description		
Role	Multi-role Military and Civilian Helicopter	
Crew	one or pilots	
Manufacturer	Hindustan Aeronautics Limited ( <a href="#">HAL</a> )	
Dimensions		
Length	12.89 m	42 ft 3 in
Height	3.76 m	12 ft 4 in
Main rotor diameter	8.20 m	26 ft 11 in
Main rotor area	137 m <sup>2</sup>	1,472 ft <sup>2</sup>
Weights		
Maximum takeoff	5,500 kg	12,100 lb
Empty	2,580 kg	5,690 lb
Powerplant		
Option 1	2x Turboméca TM 333 2B	
Power	747 kW	1,000 shp
Option 2	2x <a href="#">Turboméca</a> & <a href="#">HAL</a> Ardiden 1H (Shakti)	
Power	900 kW	1,200 shp
Performance		
Maximum speed	280 km/h	175 mph
Range	640 km	530 miles
Service ceiling	7,000 m	23,000 ft
Rate of climb	540 m/min	1,771 ft/min
Armament		
Guns	1x 20 mm 8 anti-tank guided missiles OR 4 AAMs OR 4 x 68mm rocket pods (Air-Force & Army) 2 torpedoes, depth charges OR anti-ship missiles	
Other		
Customers	<a href="#">Indian Coast Guard</a> , <a href="#">Indian Navy</a> , <a href="#">Indian Air Force</a> , <a href="#">Indian Army</a> , <a href="#">Nepal</a> and <a href="#">Israel</a>	

for details). The **HAL Dhruv** (Sanskrit:"[Pole Star](#)") is a multi-role advanced [helicopter](#) made by [Hindustan Aeronautics](#) Ltd. (HAL). It is currently being supplied to the [Indian](#) Armed forces ([Indian Coast Guard](#), [Indian Navy](#), [Indian Air Force](#), [Indian Army](#)), a civilian variant is also available. It has also been exported to [Israel](#),[Chile](#) and [Nepal](#). Specialised military variants will eventually include [ASW](#) machines and [helicopter gunships](#).

## Development

Hindustan's **ALH** programme (Advanced Light Helicopter) was first announced in November [1984](#), but progress was slow. Even after the first prototype flew in August [1992](#), problems arose due to the changing demands of the Indian military, funding, and contractual issues with [MBB](#), which was the consultant for design. Further obstacles were created by the US sanctions after Indian Nuclear Tests in 1998, which embargoed the engine originally intended to power the helicopter.

Deliveries of the 300 machines on order finally commenced in [2002](#), a full ten years after the prototype's first flight, and nearly twenty years after the programme was initiated.

## HH-43 Huskie



*HH-43 Huskie*

### Description

Role	Firefighting/rescue helicopter
Crew	4 (2 pilots, 2 firefighter/rescue specialists)

### Dimensions

Height	17 feet, 2 inches	5.23 m
Rotor diameter	47 ft	14.3 m

### Weights

Empty	11,865 lb	5,382 kg
Loaded	9,150 lbs. max.	
Maximum take-off	9,150 lb	4,150 kg

### Powerplant

Engines	Lycoming T-53 or Pratt & Whitney R-1340-48
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### Performance

Maximum speed	120 mph	193 km/h
Range	185 mi	298 km
Service ceiling	25,000 ft	7,620 m

The [Kaman HH-43 Huskie](#) is a [helicopter](#) that was used by the [United States Air Force](#), the [United States Navy](#) and the [United States Marine Corps](#) in the [1950s](#) thru [1970s](#). It was primarily used for aircraft [firefighting](#) and rescue.

The Huskie had an unusual inter-meshing twin-rotor arrangement with control effected by servo-flaps. The first prototype flew in [1947](#) and was adopted by the U.S. Navy with a piston-engined version. It was later adopted by the Air Force in a [turboshaft](#) B and F versions.

This aircraft saw use in the [Vietnam War](#) before being replaced by newer aircraft in the early [1970s](#).

## External links

- [HH-43 page at the National Museum of the United States Air Force](#)
- [KensAviation.com page on the HH-43](#)
- [Museum of Aviation HH-43 page](#)

## HH-60 Jayhawk



HH-60 Jayhawk

The **HH-60 Jayhawk** is a twin-engine medium-range [search and rescue](#) (SAR) [helicopter](#), based on the airframe of the [Sikorsky S-70](#). Besides SAR, it is used for drug interdiction, cargo lift, and special operations. It was developed for the [United States Coast Guard](#) to replace the aging [Sikorsky HH-3F Pelican](#) in [1986](#).

### Development

The Jayhawk is manufactured by Sikorsky Aircraft Corporation, 42 were built with 35 in operation and another 7 in storage or support roles. The 6,460 lb (2930 kg) fuel capacity allows the Jayhawk to operate for 7 hours within a 300 nautical mile radius. The rescue hoist can handle 600 lb (272 kg), but the helicopter is not able to perform water landings as its predecessor the Pelican was.

### Specifications (HH-60J)

#### General characteristics

- **Crew:**
- **Capacity:**
- **Length:** 65 ft (19.8 m)
- **Rotor diameter:** 54 ft (16.5 m)
- **Height:** 17 ft (5.2 m)
- **Empty:** 14,500 lb (6580 kg)
- **Loaded weight:** kg ( lb)
- **Maximum gross takeoff weight:** 21,884 lb (9926 kg)
- **Powerplant:** 2x [General Electric T700](#)-GE-401C [gas turbines](#), 1980 hp (1476 kW) each



HH-60 Jayhawk lowering a rescue swimmer

## Performance

- **Maximum speed:** 180 knots (330 km/h)
- **Cruise speed:** 140 knots (260 km/h)
- **Range:** 700 nautical miles (1,300 km)
- **Service ceiling:** 5000 ft (1520 m) (hovering)
- **Maximum rate of climb:** ft/min ( m/s)
- **Power/mass:** hp/lb ( kW/kg)

## Deployment

HH-60J Air Stations

- CGAS [Astoria, Oregon](#)
- CGAS [Clearwater, Florida](#)
- CGAS [Cape Cod, Massachusetts](#)
- CGAS [Elizabeth City, North Carolina](#)
- CGAS [San Diego, California](#)
- CGAS [Sitka, Alaska](#)
- CGAS [Kodiak, Alaska](#)
- CGAS/ATC [Mobile, Alabama](#)

## References

- [HH-60 Jayhawk](#). URL accessed on [October 19, 2005](#).
- [HH-60 Jayhawk specifications](#). URL accessed on [October 19, 2005](#).



## HH-60 Pave Hawk



A New York Air National Guard HH-60G



Air Force HH-60G Pave Hawk helicopter

The primary mission of the **Sikorsky HH-60G Pave Hawk [helicopter](#)** is to conduct day or night operations into hostile environments to recover downed aircrew or other isolated personnel during war. Because of its versatility, the HH-60G may also perform peace-time operations. Such tasks include civil search and rescue, emergency aeromedical evacuation ([MEDEVAC](#)), disaster relief, international aid, counterdrug activities and NASA space shuttle support.

### Design

The Pave Hawk is a highly modified version of the Sikorsky [UH-60 Black Hawk](#) helicopter, manufactured by [United Technologies](#) and [Sikorsky Aircraft Corporation](#) and first deployed in [1982](#). It features an upgraded communications and navigation suite that includes an integrated [inertial navigation/global positioning/Doppler](#) navigation systems, satellite communications, secure voice, and have quick communications. Pave Hawks cost an estimated \$15.8 million (U.S. dollars, [1998](#)) each to construct.

All HH-60Gs have an automatic flight control system, [night vision](#) goggles lighting and forward looking infrared system that greatly enhances night low-level operations. Additionally, Pave Hawks have color weather [radar](#) and an engine/rotor blade anti-ice system that gives the HH-60G an all-weather capability.

Pave Hawk mission equipment includes a retractable [in-flight refueling](#) probe, internal auxiliary fuel tanks, two crew-served 7.62 mm [machine guns](#) and an 8,000 pound (3,600 kg) capacity cargo hook. To improve air transportability and shipboard operations, all HH-60Gs have folding rotor blades.

Pave Hawk combat enhancements include a radar warning receiver, infrared jammer and a [flare/chaff countermeasure](#) dispensing system.

HH-60G rescue equipment includes a hoist capable of lifting a 600 pound (270 kg) load from a hover height of 200 feet (60 m), and a personnel locating system that is compatible with the PRO-112 survival radio and provides range and bearing information to a survivor's location.

A limited number of Pave Hawks are equipped with an over-the-horizon tactical data receiver that is capable of receiving near real-time mission update information.

## Operation

The Pave Hawk is a twin-engine medium-lift helicopter operated by Air Force Special Operations Command (AFSOC), Pacific Air Forces, Air Education and Training Command, Air National Guard and Air Force Reserve Command.

During Operation [Desert Storm](#) Pave Hawks provided combat search and rescue coverage for coalition Air Forces in western [Iraq](#), [Saudi Arabia](#), coastal [Kuwait](#) and the [Persian Gulf](#). They also provided emergency evacuation coverage for [U.S. Navy](#) sea, air and land ([SEAL](#)) teams penetrating the Kuwaiti coast before the invasion.

During Operation [Allied Force](#), the Pave Hawk provided continuous combat search and rescue coverage for [NATO](#) air forces, and successfully recovered two [U.S. Air Force](#) pilots who were isolated behind enemy lines.

In [March 2000](#), three Pave Hawks deployed to Hoedspruit Airforce Base in [South Africa](#), to support international flood relief operations in [Mozambique](#). The HH-60Gs flew 240 missions in 17 days and delivered more than 160 tons of humanitarian relief supplies.

## General characteristics

- **Crew:** 4 (2 pilots, flight engineer, gunner)
- **Capacity:**
- **Length:** 17.1 m (64 ft 10 in)
- **Height:** 5.1 m (16 ft 8 in)
- **Rotor diameter:** 14.1 m (53 ft 8 in)
- **Empty:** kg (16000 lb)
- **Loaded weight:** kg (21000 lb)
- **Maximum gross takeoff weight:** 9,900 kg (22,000 lb)
- **Powerplant:** 2x [General Electric T700](#)-GE-700 (or T700-GE-701C) [turboshafts](#), 1220 kW (1630 hp) each (1450 kW each for 701C engine)

## Performance

- **Maximum speed:** 294 km/h (193 kt)
- **Cruise speed:** km/h ( mph)
- **Range:** 811 km (445 [nautical miles](#), 504 [statute miles](#)), unlimited with air refueling
- **Service ceiling:** m ( ft)
- **Maximum rate of climb:** m/s ( ft/min)
- **Power/mass:** hp/lb ( kW/kg)

## Armament

- 2x 7.62 mm or .50 caliber [machine guns](#)

## HUP Retriever

The [Piasecki HUP Retriever](#) was a twin-rotor utility [helicopter](#) designed for the [US Navy](#), which first flew in March [1948](#). It entered service with the Navy and [USMC](#) from the following year.

It also served with the [US Army](#) as the **H-25**, a designation adopted by the other services in [1962](#). The final units were withdrawn from US service in [1964](#).

It also served with the [French Navy](#) from [1953](#) to [1965](#).

### Specifications (HUP-3 Retriever)

#### General characteristics

- **Crew:** two pilots
- **Capacity:** 4 passengers
- **Length:** 56 ft 11 in (17.35 m)
- **Main rotor diameter:** 35 ft 0 in (10.67 m)
- **Height:** 12 ft 6 in (3.81 m)
- **Main rotor area:** 1,924 ft<sup>2</sup> (179 m<sup>2</sup>)
- **Empty:** 3,928 lb (1,782 kg)
- **Loaded:** 5,750 lb (2,608 kg)
- **Maximum takeoff:** 6,100 lb (2,767 kg)
- **Powerplant:** 1× [Continental R-975](#)-46A radial, 550 hp (410 kW)

#### Performance

- **Maximum speed:** 105 mph (169 km/h)
- **Range:** 340 miles (547 km)
- **Service ceiling:** 10,000 ft (3,048 m)
- **Rate of climb:** 100 ft/min (305 m/min)
- **Main rotor loading:** 3 lb/ft<sup>2</sup> (15 kg/m<sup>2</sup>)
- **Power/mass:** 0.09 hp/lb (0.16 kW/kg)

#### Related content

Related development:

Comparable aircraft:

Designation sequence: [YH-22](#) - [OH-23](#) - [YH-24](#) - **H-25** - [XH-26](#) - [H-27](#) - [XH-28](#)

## Helicopter gunship

To meet Wikipedia's [quality standards](#), this article or section may require [cleanup](#).

See rationale on the [talk page](#), or replace this tag with a [more specific message](#). [Editing help](#) is available.

(Tagged November 2005)

A [helicopter gunship](#) is a military helicopter armed for attacking targets on the ground, using [automatic cannon](#) and [machinegun](#) fire, [rockets](#), and precision guided [missiles](#) such as the [Hellfire](#). Many attack helicopter are also capable of carrying [air to air missiles](#), though mostly for the purposes of self defense. The Attack Helicopter has two main roles: first, to provide direct and accurate close air support for ground troops, and second, to destroy enemy armor behind enemy lines.

### History

The Helicopter Gunship dates back to the 1960s when the [French](#) armed [Piasecki H-21s](#) with rockets in the [Algerian War of Independence](#).

The first systematic use of the helicopter gunship was during [Vietnam](#). With the increasing use of the helicopter as a transport, the US saw a need for Helicopters to be used as aerial artillery to support ground troops, closer to the battle. The US Army used a [UH-1](#), and put machine guns, and folding fin rockets on struts parallel with the fuselage. This configuration worked well, but the Army felt that they needed a purpose built aircraft that could deliver more firepower, and the [AH-1](#) was developed with a slender fuselage to make the aircraft a small target, among other improvements.

During the same period [Russia](#), then the [Soviet Union](#), saw the same need and equipped [Mil Mi-8](#)'s in a similar configuration as the US Army UH-1's. This was eventually developed into the famous [Mi-24 Hind](#).

During the late 70's the US Army saw the need of more sophistication within the attack helicopter corps, allowing them to operate in all weather conditions. With that the Advanced Attack Helicopter program was started. From this program the Hughes YAH-64 came out as the winner. The Russians watching US aircraft development, saw the need of a more advanced helicopter also. Military officials asked Kamov, and Mil to submit designs. The Ka-50 officially won the competition, but Mil decided to continue development of the Mil-28 that they submitted.

The 1990's could be considered the proving ground for the Gunship Helicopter for the US. The [AH-64](#) were used extensively during [Operation Desert Storm](#) with great success. AH-64's were used the fire the first shots of the war, destroying [SAM](#) sites, with their Hellfire missiles. They were later used successfully in both their operational roles, as direct attack against enemy armor, and as aerial artillery in support of group troops.

The gunship was developed to its current form, in particular the AH-64D which some feel is the pinnacle of a high technology gunship, at least until stealth technology is fully brought over to rotary wing aviation. The Russians are currently deploying the Ka-50, and Mi-28, but at a command and control system level, they aren't as linked with ground troops as current American equipment. Many feel that this is a requirement since they are considered support elements by most of the Armies of the world.

In the last 20 years USSOCOM has been developing the armed special forces gunship using the MH-60. To be used as an attack element, with Special Operators to do the clean up, or to deliver the operators, and support them on the ground. They were used successfully (to the chagrin of CINC CENTCOM) during the Scud Hunt.

The US Army typically uses observation helicopters (such as the OH-58, and H-6) in support of gunship helicopters. But it is starting to fall out of favor as the gunships are getting as sophisticated, or better systems than the observation helicopters deployed to support them.

## Models

Modern examples include:

- [AH-1 Cobra](#)
- [Mil Mi-24](#)
- [AH-64 Apache](#)
- [Eurocopter Tiger](#)
- [Mil Mi-28 Havoc](#)
- [Kamov Ka-50](#)
- [Kamov Ka-52 Alligator](#)
- [Westland Lynx](#)

## Huey II

The **Huey II** is an modified and re-engined [Bell Helicopter UH-1H](#) utility [helicopter](#), significantly upgrading its performance and cost-effectiveness. Currently offered by the manufacturer, [Bell Helicopter](#), Incorporated to all present users of the type.

AH-6 Little Bird	
Description	
Role	<a href="#">Assault</a>
Crew	2
First Flight	
Entered Service	
Manufacturer	<a href="#">Hughes Helicopters</a> and <a href="#">McDonnell Douglas</a>
Dimensions	
Length	9.8 m
Height	2.6 m
Weights	
Empty	896 kg
Loaded	kg
Maximum takeoff	1,610 kg
Capacity	
Powerplant	
Engines	One <a href="#">Allison</a> T63-A-5A or T63-A-700 <a href="#">Turboshaft</a>
Power	317 hp 236 kW
Performance	
Maximum speed	mph 282 km/h
Combat range	miles 430 km
<a href="#">Service ceiling</a>	ft 4,875 m
Rate of climb	ft/min 63 m/min
Power/Mass	hp/lb kW/kg
Avionics	
<a href="#">Avionics</a>	
Armament	
<a href="#">Guns</a>	Two <a href="#">M-60</a> 7.62 mm <a href="#">machine gun</a> ; Two .50 cal (12.7 mm) MG pods
<a href="#">Bombs</a>	
<a href="#">Missiles</a>	Two <a href="#">TOW</a> missile pods; Two <a href="#">Hellfire ATGM</a> ; Two <a href="#">Stinger AAM</a>
<a href="#">Rockets</a>	Two 2.75 in (70 mm) Hydra 70 rocket pods
Other	Two 40 mm <a href="#">grenade launchers</a>

The [Hughes H-6](#) is a family of light utility civilian (Hughes 500) and assault [helicopters](#) of the [United States Army](#) (OH-6). Hughes developed the first variant, the **OH-6 Cayuse**, as a scout and utility [aircraft](#) for the [Vietnam War](#). It was the original winner of the LOH Light Observation Helicopter competition, and was dubbed "Loach" in the Vietnam conflict. The losers in that competition were Fairchild Hiller, which faded away in helicopters, and Bell Helicopter with an entry that would later sprout a slick looking pointy nose and dominate the civilian midrange helicopter market as the [Bell 206 Jetranger](#). Reason for the Jetranger's dominance may have to do with the space in a stretched cabin, or simply sharper looks. The latest version of the [OH-58](#) has a 4-bladed rotor.

The Hughes helicopter is noted for high performance, low noise due its 5 bladed rotor, and small size. The OH-6 would act as scouts to draw fire and spot enemy positions, while only lightly armed with a fixed minigun, teamed with AH-1 HueyCobra gunships and UH-1 Huey troop ships.

The Army would later adopt the OH-58 militarized version of the Jetranger in a second round LOH competition, despite criticism from pilots that the OH-6 was a better performer. Indeed, after the division was purchased by [McDonnell Douglas](#) it would be used by special forces as the **AH-6** and [MH-6 Little Birds](#), dubbed "Killer Eggs".

The Little Bird is flown by units of the [U.S. Army's 160th Special Operations Aviation Regiment](#) (SOAR) at [Fort Campbell](#).

The AH-6 assault variant can carry a pod on either side of the [fuselage](#) fitted with various guns, missiles or rockets. In lieu of pods, the MH-6 troopship variant is rigged with a slick platform on either side for carrying up to six men on the outside of the helicopter. It can cruise at speeds of 160 mph (257 km/h).

The NOTAR no-tail rotor version is popular with law enforcement because of its very low noise levels. A jet exhaust is directed out the tail boom instead of a tail rotor.

### Japanese OH-6

In Japan, 387 OH-6s were produced under licence by [Kawasaki Heavy Industries](#) and used at [Japan Ground Self-Defense Force](#) (JGSDF), Japan Maritime Self-Defense Force (JMSDF), Japan Coast Guard, and other civilian operators. Since 2001, OH-6s at JGSDF are being replaced by Kawasaki's new observation helicopter, OH-1s.

### Television and Films

OH-6s were used in the movie [Capricorn One](#). Other movies that feature H-6s include [Blue Thunder](#), [Outbreak](#), [Fire Birds](#), [Black Hawk Down](#) and [Apocalypse Now](#). A cartoon show "skyhawks" also featured a Hughes 500. Perhaps its most famous role was in the television show [Magnum P.I.](#), albeit the example used on the show was of a more advanced variant (which also incorporates a redesigned tailpiece)-- the McDonnell Douglas [MD500 Defender](#).

A stretched and improved MD500, the MD600N, with a [NOTAR](#) tail is seen in the James Bond film [Die Another Day](#).



OH-6A Cayuse

The type holds the official [world record](#) for the longest flight by a helicopter, set on [April 6, 1966](#) by Robert Ferry in a [prototype](#) YOH-6. He flew from [California](#) to [Florida](#), covering a total of 1,923.08 [nm](#) (3,561.55 [km](#)).

## IAR 316



IAR 316B military version

The **IAR 316** the Romanian version, built under licence, of [Aerospatiale SA 319B](#) Alouette III light utility [helicopter](#). **IAR 316** is used for both military and civil purposes. The production started in [1970](#) at the [IAR](#) plant near [Braşov](#). More than 230 units were built, some of them were exported to countries like [Iran](#), [Pakistan](#), [Angola](#) and [Guinea](#). The helicopter is still operational with the [Romanian Air and Air Defense Forces](#) and as a utility helicopter. A light attack helicopter ([IAR 317](#)) was also developed based on **IAR 316** but only 14 units have been built.

### Technical data & Performance

- **Powerplant:** Engines: 1 x [Turbomeca](#) Artouste IIIB turboshaft driving a three blade main rotor and three blade tail rotor, 1 x 570 shp (425 kW)
- **Crew:** 2 + 5 passengers
- **Length:** 12.82 m (42 ft)
- **Height:** 2.97 m (9 ft 9 in)
- **Width:** 2.6 m (8 ft 6 in)
- **Rotor diameter:** 11.02 m (36 ft 2 in)
- **Empty weight:** 1,050 kg (2,315 lb)



- **Max takeoff weight:** 2,200 kg (4,850 lb)
- **Max fuel weight** 550 kg (1,210 lb)
- **Max speed:** 210 km/h (130 miles)
- **Range:** 540 km (335 miles)
- **Ceiling:** 3200 m (10,500 ft)
- **Max climb rate:** 260 m/s (850 ft/s)

## Related content

Related development: [Aerospatiale SA 319B](#)

Comparable aircraft:

Designation sequence: [IAR 99](#)- [IAR 316](#) - [IAR 317](#) - [IAR 330](#)

### IAR 330



IAR 330 Puma

The **IAR 330** is the Romanian built version of Aerospatiale [SA 330](#) Puma. More than 163 helicopters have been built for domestic use, out of which 104 were destined for military usage. 57 helicopters have been produced for export. Also a SAR (search and rescue) version, fitted with inflatable floaters for emergency landing on the sea, had been built in a small batch. Production is still ongoing at [IAR Ghimbav](#) plant near [Brasov](#). 24 helicopters have been recently upgraded to [IAR 330L Socat](#).

## Technical data & Performance

- **Powerplant:** 2 Romanian built TURMO IV B turboshafts (2x1400hp)
- **Length:** 15.0 m (49 ft 2 in)
- **Height:** 4.6 m (15 ft 1 in)
- **Width:** 3.38 m (11 ft 1 in)
- **Rotor diameter:** 16.2 m (53 ft 1 in)
- **Empty weight:** 3,615 kg (7,970 lb)
- **Max TO weight:** 7,400 kg (16,300 lb)
- **Max speed:** 263 km/h (164 miles)
- **Range:** 550 km (342 miles)

- **Ceiling:** 4800 m (15,750 ft)

## Armament

- 1 x [23 mm GSh-23L](#) cannon (some versions are equipped with 2 cannons)
- [Malyutka](#) wire guided ATGM
- [LPR 57](#) rocket launcher
- 2 x 7.62mm caliber mobile machine guns

**Comparable aircraft:** [Aérospatiale Puma](#)- [Eurocopter Cougar](#)- [Eurocopter Super Puma](#)- [IAR 330L Socat](#)

**Designation sequence:** [IAR 316](#) - [IAR 317](#) - [IAR 330](#) - [IAR 330L Socat](#)

## Jesus nut

The **Jesus nut**, also called the **Jesus pin**, is the hexagonal [nut](#) that holds the main rotor to the mast of some [rotary-wing aircraft](#), such as the [UH-1 Iroquois](#) helicopter. It is a slang term first coined by American soldiers in [Vietnam](#); the technical term is **main rotor retaining nut**.

The origin of the term is the idea that, if the Jesus pin were to fail in flight, the helicopter would detach from the rotors and the only thing left for the crew to do would be to pray to [Jesus](#). Real examples of the Jesus pin failing are few and far between, although in 2002, a civilian helicopter of the Mercy Air Services suffered a "main rotor blade separation", with the death of all those on board. The exact cause was never determined, but it is likely that the Jesus nut failed for reasons unknown [1](#). Some more recent helicopter systems do not have a Jesus nut.

More recently, it has come to be a generic [engineering](#) term, referring to any single component of a system whose failure would cause catastrophic failure of the whole system.