

The [A-B Helicopters A/W 95](#) is a tiny single-seat open-framework helicopter designed for [home-building](#), based on the [Adams-Wilson Hobbycopter](#) of the 1950s.

Specifications (A/W 95, typical)

General Characteristics

- **Crew:** one pilot
- **Length:** 15 ft 0 in (4.57 m)
- **Main rotor diameter:** 19 ft 6 in (5.94 m)
- **Height:** 6 ft 5 in (1.96 m)
- **Main rotor area:** 299 ft² (28 m²)
- **Empty:** 272 lb (123 kg)
- **Loaded:** 490 lb (222 kg)
- **Maximum takeoff:** lb (kg)
- **Powerplant:** various - [Rotax 583](#) or similar

Performance

- **Maximum speed:** 85 mph (136 km/h)
- **Range:** miles (km)
- **Service ceiling:** ft (m)
- **Rate of climb:** ft/min (m/min)
- **Main rotor loading:** 1.6 lb/ft² (8 kg/m²)
- **Power/Mass:** varies

AEG (*Allgemeine Elektrizitäts-Gesellschaft*) (English Translation: [General Electricity Company](#)) is a [German](#) producer of [electronics](#) and electrical equipment. AEG was founded in [1883](#) by [Emil Rathenau](#) who had bought some patents from [Thomas Edison](#). AEG manufactured a range of aircraft from 1910 to 1918. During WWII AEG engineers played a significant role in developing the magnetic audio tape recorder.

In [1967](#) AEG joined with [Telefunken](#) and in [1969](#) they started working with [Siemens AG](#). In [1985](#) AEG was bought by [Daimler-Benz](#). The Household Appliances business was sold to [Electrolux](#) in [1996](#). The Transportation business was reorganized into [Adtranz](#) which was sold to Bombardier later.

Models

- [AEG B.I](#)
- [AEG B.II](#)
- [AEG B.III](#)
- [AEG C.I](#)
- [AEG C.II](#)
- [AEG C.III](#)
- [AEG C.IV](#)
- [AEG C.V](#)
- [AEG C.VIII](#)
- [AEG D.I](#)
- [AEG DJ.I](#)

- [AEG Dr.I](#)
- [AEG F.1](#)
- [AEG G.I](#)
- [AEG G.IV](#)
- [AEG J.I](#)
- [AEG J.II](#)
- [AEG R.I](#)

AEG helicopter

The [AEG helicopter](#) was an unusual German aircraft project, intended to create a portable observation post in the form of a tethered helicopter. It achieved lift by use of two [contra-rotating](#) rotors powered by an electric motor that was supplied with power from the ground. The device could be folded for transportation on the back of a truck. An observer's cabin was suspended underneath the rotor assembly, and could be blown clear by an explosive charge in case of emergency. Development commenced in [1933](#), but it was never put into service by the military.

Specifications (AEG helicopter)

General Characteristics

- **Crew:** one, observer
- **Main rotor diameter:** 7.92 m (26 ft 0 in)
- **Height:** m (ft in)
- **Main rotor area:** 98.5 m² (1,060 ft²)
- **Empty:** kg (lb)
- **Loaded:** kg (lb)
- **Maximum takeoff:** 1,225 kg (2,695 lb)
- **Powerplant:** 1x [AEG electric motor](#), 150 kW (200 hp)

Performance

- **Service ceiling:** 1,000 m (3,280 ft)
- **Rate of climb:** m/min (ft/min)
- **Main rotor loading:** kg/m² (lb/ft²)
- **Power/Mass:** kW/kg (hp/lb)

AH-1 Cobra



AH-1W SuperCobra

Description

Role	Attack
Crew	2 — one pilot, one co-pilot/gunner (CPG)

Dimensions

Length	13.6 m (44 ft 7 in)
Height	4.1m (13 ft 5 in)

Weights

Empty	AH-1S: 2,993 kg (6,598 lb)
	AH-1Z: 5,398 kg (11,900 lb)
Max take-off	AH-1S: 4,535 kg (10,000 lb)
	AH-1Z: 8,392 kg (18,500 lb)

Powerplant

Engines	AH-1G: 1x Avco Lycoming T53-L-13 turboshaft, 1,800 shp (1,300 kW)
	AH-1Q, AH-1S: 1x Avco Lycoming T53-L-703 turboshaft
	AH-1J, AH-1T: 2x Pratt & Whitney Canada PT6T (T400) turboshaft
	AH-1T, AH-1W, AH-1Z: 2x General Electric T700-GE-401 turboshaft, 1,723 shp each

Performance

Maximum speed	AH-1S: 195 km/h (105 knots)
	AH-1Z: 411 km/h (222 knots)
Combat range	AH-1S: 507 km (315 miles)
Service ceiling	AH-1S: 3,720 m (12,200 ft)
Rate of climb	AH-1S: 494 m/min (1,620 ft/min)

AH-1 Cobra Helicopter

The **AH-1 Cobra**, called the "Huey Cobra", "Cobra", or "Snake", is an attack [helicopter](#), designed by [Bell Helicopter Textron](#). It shares a common [engine](#), [transmission](#) and [rotor](#) system with the [UH-1](#). It is now fully replaced by the [AH-64 Apache](#) in [US Army](#) service, but upgraded versions continue to fly with [US Marine Corps](#) and several other users.

Early history

Closely related with the development of the Bell AH-1 is the story of the [Bell UH-1](#) – predecessor of the modern helicopter, icon of the [Vietnam War](#) and still one of the most numerous helicopter types in service today.

Bell's XH-40 prototype first flew on 22 October [1956](#) and entered production in the same year as the HU-1A. The "HU" designation spawned the famous "Huey" nickname, although the realignment of US service designations in [1962](#) changed it into the familiar UH-1. The UH-1 made the theory of air [cavalry](#) practical, as the new tactics called for US forces to be highly mobile across a wide area. Unlike before, they would not stand and fight long [battles](#), and they would not stay and hold positions. Instead, the plan was that the troops carried by fleets of Hueys would range across the country, to fight the enemy at times and places of their own choice.

It soon became clear that the unarmed UH-1 troop helicopters were not able to make opposed troop drops in the landing zones, but that heavy firepower would be needed to clear the [Viet Cong](#) and [NVA](#) troops out of the way.

By 1962 a small number of armed HU-1As (UH-1As) were escorting [H-21](#) (CH-21) troop transports in and out of the landing zones, but the strict [rules of engagement](#) at the time prevented the gunships from operating effectively, as they could not fire until fired upon.

The massive expansion of [American](#) military presence in Vietnam opened a new era of war from the air. The linchpin of US Army tactics were the helicopters, and the protection of those helicopters became a vital role.

Sioux Scout

In December 1962 Bell had initiated a private venture purpose-built gunship to US forces in Vietnam. The role of this new helicopter was to protect the troopships and to wield a full combat capability of its own. Bell's first design was built around a modified [Model 47](#), leading to the sleek Model 207 Sioux Scout which first flew in July [1963](#).

The Sioux Scout had all the key features of a modern helicopter gunship – a tandem [cockpit](#), stub [wings](#) for weapons, and a chin-mounted gun [turret](#). After evaluating the Sioux Scout in early [1964](#), the Army was impressed, but also believed the Sioux Scout was too small, underpowered, unsophisticated, and fragile to be of practical use.

AAFSS

Army's solution to the shortcomings of the Sioux Scout was to launch the Advanced Aerial Fire Support System (AAFSS) competition.

The AAFSS requirement would give birth to the [Lockheed AH-56 Cheyenne](#) – a heavy battlefield helicopter that would prove to be over-ambitious, over-complex and over-budget, before being cancelled 10 years later in [1972](#). The Cheyenne programme developed future technology and demonstrated some impressive performance, but was never made to work as a functional gunship. It served to underline an important rule of the combat helicopter – survival would be ensured only by the right mix of speed, agility and weapons.

Model 209

At the same time, despite the Army's preference for the AAFSS – for which Bell Helicopter was not selected to compete – Bell stuck with their own idea of a smaller and lighter gunship. In January [1965](#) Bell invested \$1 million to proceed with a new design. Mating the proven transmission, rotor system, and the T53 turboshaft of the UH-1 with the design philosophy of the Sioux Scout, Bell produced the Model 209.

In Vietnam, events were also advancing in favour of the Model 209. Attacks on US forces were increasing, and by the end of June [1965](#) there were already 50,000 US ground troops in Vietnam.

1965 was also the deadline for AAFSS selection, but the programme was stuck in technical difficulties and political bickering. The US Army needed an interim gunship for Vietnam and it asked five companies to provide a quick solution. Submissions came in for armed variants of the [Boeing-Vertol CH-47A](#), [Kaman UH-2](#), Piasecki 16H Pathfinder, [Sikorsky S-61](#), and Bell 209.

On 3 September 1965 Bell rolled out the prototype, and four days later she made her maiden flight, only eight months from the go-ahead. After the Model 209 had faced an evaluation against the other rival helicopters, in April [1966](#) the US Army signed the first production contract for 110 aircraft.

Delivery

By June [1967](#), the first AH-1G HueyCobras had been delivered. Originally designated as UH-1H, the “A” for attack designation was soon adopted and when the improved UH-1D became the UH-1H, the HueyCobra became the AH-1G.

Bell built 1,116 AH-1Gs for the US Army between 1967 and [1973](#), and the Cobras chalked up over a million operational hours in Vietnam.



Army AH-1G with fearsome nose art

Operations

The Cobra is simpler to maintain than the Apache, and has a smaller shipboard footprint, two main reasons it remains in service with the Marine Corps. Its main usage is against armored targets. The Cobra's narrow front gives it a defensive advantage making it a harder target to acquire.

Combat Experience



U.S. Marines AH-1W Super Cobra refueling during [Operation Iraqi Freedom](#).

The AH-1 Cobras were in use during Tet (1968) and extensively by the Army through the end of the [Vietnam War](#). During the [1983 invasion of Grenada](#), the HueyCobra supported [Marine](#) operations on the island.

During [Operation Desert Storm](#), the Cobras and SeaCobras deployed in a support role. Approximately 78 Marine Cobras flew 1,273 sorties with no combat losses and only one noncombat loss.

Cobra [helicopter gunships](#) were also used widely by the [Israeli Air Force](#) in [Operation Peace for Galilee](#) to destroy [Syrian](#) armor and fortification. IAF Cobras destroyed dozens of Syrian [armored fighting vehicles](#), including many of the modern Soviet [T-72 main battle tanks](#).

Iraqi [Mi-24s](#) participated in air combat with [Iranian](#) AH-1J SeaCobras on several separate occasions during the [Iran-Iraq War](#), ending favorably for the Iraqis with ten AH-1Js downed by Mi-24s compared to six Mi-24s downed by AH-1Js.

AH-1 Cobras are still used by the US military [to this day](#), most notably in the ongoing [Conflict in Iraq](#). AH-1 Cobras are also still used by the [Israeli Air Force](#), with highly favorable reviews.

Variants

Single engined

- **AH-1G HueyCobra**
- **JAH-1G HueyCobra** (one armament test helicopter)
- **TH-1G HueyCobra** (dual-control trainers)
- **Z.14 HueyCobra** (Spanish navy designation of the AH-1G)
- **AH-1Q**
- **AH-1R**
- **AH-1S**
- **AH-1P** (redesignated Step 1 production standard AH-1S)
- **AH-1E** (redesignated Step 2 up-gunned AH-1S)
- **AH-1F** (redesignated Step 3 modernized AH-1S)
- **Model 249**

Twin engined

- **AH-1J SeaCobra**
- **AH-1T Improved SeaCobra**
- **AH-1W SuperCobra** ("Whiskey Cobra")
- **AH-1Z SuperCobra** ("Zulu Cobra")

Users

- [Bahrain](#)
 - AH-1E (12 in use)
 - TAH-1P combat trainer (6 in use)
- [Iran](#)
 - AH-1J (202 delivered)
- [Israel](#)
 - AH-1S "Tzefa" עפצ (approx. 50 in use)
- [Japan](#)
 - AH-1S (licence-manufactured by [Fuji Heavy Industries](#), 89 delivered)
- [Jordan](#)
 - AH-1F (33 in use)
- [Republic of Korea](#)
 - AH-1S (42 delivered)
 - AH-1F (20 delivered)
- [Pakistan](#)
 - AH-1F (18 in use)

- [Taiwan \(Republic of China\)](#)
 - AH-1W (63 delivered)
- [Thailand](#)
 - AH-1F (3 in use)
- [Turkey](#)
 - AH-1W (9 in use)
 - AH-1P/S (32 delivered)
- [United States](#)
 - [Marine Corps](#)
 - AH-1W (approx. 269 delivered)
 - [Navy](#)
 - AH-1W (7 in use)

Specifications

Armament



Chin Turret with M197 20-mm cannon

- **AH-1G**
 - M134 7.62-mm [minigun](#) and M129 40-mm grenade launcher mounted in an Emerson M28 nose turret. Twin M134s or twin M192s could also be fitted in the turret.
 - 7.62-mm gun pods and 2.75-in rocket pods mounted on the stub wings
- **AH-1Q**
 - Added capability for [BGM-71 TOW](#) anti-tank missiles
- **AH-1E (AH-1S Step 2)**
 - M28 turret replaced by an [M197](#) 20-mm cannon mounted in the M97A1 Universal Turret
- **AH-1W**
 - Added capability for laser-guided [AGM-114 Hellfire](#) anti-tank missiles, [AIM-9 Sidewinder](#) air-to-air missiles and [AGM-122 Sidearm](#) anti-radiation missiles

AH-56 Cheyenne

The **AH-56** was designed as a replacement for the [AH-1 Cobra](#) attack helicopter. It was intended to correct the Cobra's deficiencies in speed, survivability and firepower. The Cheyenne was an interesting project in that it is not a true helicopter. The AH-56 has a substantial wing and a rigid main rotor. Thrust was provided by a pusher-prop at the rear of the aircraft. Because the main rotor is not relied on for the full amount of lift (thanks to the wings) or thrust (thanks to the pusher prop), the Cheyenne was able to reach very high speeds, in excess of 200kts. (Because of the design, the Cheyenne is a compound aircraft, and unable to qualify for speed records in helicopter categories) The Cheyenne also featured an advanced navigation and fire control suite. The development of these new technologies led to many cost and time overruns, and an adjustment in the Army's specification led to the Cheyenne's demise in favor of the [AH-64 Apache](#).

Probably the oddest feature of the AH-56 was the gunner's station. Like the [AH-1 Cobra](#), the AH-56 had two crewmembers, a pilot and a gunner. Unlike the AH-1, the Cheyenne's gunner sat in the rear. The AH-56 sported a turret in the middle of its underbelly with a 360° firing arc (contrasted to the limited forward arc of the AH-1's chin turret). On the Cheyenne, the gunner's entire station—seat, consoles, everything—rotated along with the turret to keep the gunner facing the same direction as the guns! This was despite the fact that the gunner couldn't see out of the Cheyenne in the rear 120° or so! The gunner actually had a sight that gave him the view directly from the turret. (Oddly enough, the somewhat-contemporaneous [MBT-70](#) tank prototype had a similar feature: the driver sat in a counter-rotating seat in the turret, so that whichever way the turret rotated, he always faced the front of the tank!)

[Adams-Wilson Hobbycopter](#)

The [Adams-Wilson Hobbycopter](#) (later named the **Choppy**) is a tiny single-seat open-framework [helicopter](#) designed for [home-building](#), to be powered by a [motorcycle](#) engine. Plans were first marketed in [1958](#) and have been revised and revived by various designers many times over the years.

Specifications (Choppy, typical)

General characteristics

- **Crew:** one pilot
- **Length:** 15 ft 0 in (4.57 m)
- **Main rotor diameter:** 21 ft 6 in (6.55 m)
- **Height:** 6 ft 0 in (1.83 m)
- **Main rotor area:** 363 ft² (34 m²)
- **Empty:** 300 lb (136 kg)
- **Loaded:** 600 lb (183 kg)
- **Maximum takeoff:** lb (kg)
- **Powerplant:** various - typically a 4-stroke triumph motorcycle engine

Performance

- **Maximum speed:** 85 mph (136 km/h)
- **Range:** miles (km)
- **Service ceiling:** 8,500 ft (2,590 m)
- **Rate of climb:** 950 ft/min (290 m/min)
- **Main rotor loading:** 1.7 lb/ft² (5.3 kg/m²)
- **Power/mass:** varies

AH-64 Apache



AH-64 Apache Helicopter

Boeing AH-64 Apache

Description

Role	Attack
Crew	2 — one pilot, one co-pilot/gunner (CPG)

Dimensions

Length	17.7 m (58.3 ft) with rotors
Wingspan	4.9 m (16.3 ft)
Height	3.87 m (12.7 ft)
Wing area	5.227 m (17.15 ft)

Weights

Empty	5165 kg (11,387 lb)
Loaded	8006 kg (17,650 lb)

Powerplant	
Max take-off	9525 kg (21,000 lb)
Engines	2 × GE T701C Turboshafts
Power	1238 kW (1,660 shp)
Performance	
Maximum speed	365 km/h (197 kt)
Combat range	482 km (260 n miles)
Ferry range	1,900 km (1,025 n miles)
Service ceiling	6400 m (21,000 ft)
Rate of climb	760 m/min (2,500 ft/min)
Armament	
Guns	M230 30mm automatic cannon , 1200 rds
Missiles	Hellfire / Hellfire II , AIM-92 Stinger , AGM-122 Sidearm , AIM-9 Sidewinder .
Rockets	Hydra 70 , FFAR

The [Boeing IDS AH-64 Apache Helicopter](#) is the [US Army](#)'s principal attack [helicopter](#), the successor to the [AH-1 Cobra](#).

History

The [US Army](#) issued a request for proposals (RFP) in [1972](#) for an Advanced Attack Helicopter (AAH). From an initial list of 5 manufacturers [Hughes Aircraft](#)'s [Toolco Aircraft Division](#) (later [Hughes Helicopters](#)) and [Bell](#) were selected as finalists. Hughes' **Model 97/YAH-64** was selected over Bell's Model 409/YAH-63 in [1976](#). First flight of a development prototype occurred on [September 30, 1975](#) but it was not until [1982](#) that a production contract was signed. In [1983](#) the first production helicopter was rolled out at Hughes Helicopter's facility at

[Mesa, Arizona](#). In [1984](#) Hughes Helicopters was purchased by [McDonnell Douglas](#) for \$500 million. This became Boeing Helicopters with the merger of McDonnell Douglas and Boeing in [1996](#).

Two major models of AH-64 Apache are in service in the US Army; **AH-64A** and **AH-64D**. B- and C-variants were manufactured but never entered service. A number of other models have been derived from both AH-64A and AH-64D for export. The British built [Westland WAH-64](#) is based on the AH-64D with several improvements.

Built to endure front-line environments, it can operate during the day or night and in adverse weather using the integrated helmet and display sight system. The Apache is also equipped with some of the latest avionics and electronics, such as the [Target Acquisition Designation Sight, Pilot Night Vision System](#) (TADS/PNVS), Black Hole passive infrared countermeasures, nap-of-earth navigation, and [GPS](#).

MOS's 15X/15Y (Apache armament electrical systems repairer) and MOS 15R (AH-64 Attack Helicopter Repairer) are easily the keystone to any successful AH-64 combat operation.



[AGM-114 Hellfire](#) and [Hydra 70](#)

AH-64D

The advanced model, the **AH-64D Apache Longbow**, is equipped with an improved sensor suite and weapon systems. The key improvement over the A-variant is the [Longbow Fire Control Radar](#) dome installed over the main rotor which houses a millimeter-wave Fire Control Radar (FCR) target acquisition system. The elevated position of the radome allows detection and (arc)ing missile engagement of targets even when the helicopter itself is concealed by an obstacle (e.g. terrain, trees or buildings). Further, a radio [modem](#) integrated with the sensor suite allows a D-variant Apache to share targeting data with other AH-64Ds and AH-64As that do not have a line-of-sight to the target. In this manner a group of Apaches can engage multiple targets but only reveal the radome of one D-variant Apache.

Also the aircraft was updated with T700-GE-701C engines, and a fully-integrated cockpit. In addition, the aircraft receives improved [survivability](#), [communications](#), and [navigation](#) capabilities. Most existing capabilities of the AH-64A Apache are retained.

Combat Operations

United States

Apache was first used in combat during the [1989](#) invasion of [Panama](#), [Operation Just Cause](#). Apache AH-64 and AH-64Ds have played important roles in several [Middle Eastern](#) wars, including the [Gulf war](#), [Operation Enduring Freedom](#) in [Afghanistan](#), and [Operation Iraqi Freedom](#) in [Iraq](#). The Apaches were proven to be excellent [tank](#) hunters and also destroyed hundreds of armored vehicles (mainly of the [Iraqi army](#)).

Recent reports indicate that the helicopter is vulnerable to ground forces in certain environments. Enduring Freedom witnessed as high as 80% of Apaches badly damaged by ground fire in mountainous regions with disparate enemy forces. Similarly, the Apache has been shown to be vulnerable to infantry when operating in urban terrain. During the Second Gulf War, Iraqi ground troops and insurgents were able to damage propulsion and flight control systems with ground-fire, sometimes obligating immediate emergency landings. During the Operation Iraqi Freedom, many Apaches were damaged or destroyed in urban combat areas. In 2003 one Apache Longbow was captured by Iraqi troops and paraded on international TV.

There are various factors that contribute to these occurrences. First, Apaches were designed to engage and destroy armor at safe ranges, where they could not be fired upon. Secondly, infantry are less easily detected than armor. In Iraq, the close-quarters, and ample cover afforded by the urban environment make it easy for ground forces to attack at close ranges (50 - 850 m). This environment brought out the Apache's vulnerability to close range attacks from heavy caliber machine guns (0.5 inch). Also, since the Apache is only capable of firing at a single target at a time, it is vulnerable when attacked from several dispersed positions. Combat utility helicopters like the [UH-60 Black Hawk](#) may not suffer this disadvantage, as they have multiple manned side armaments, adding extra protection in certain tactical situations. However, the relative effectiveness of utility helicopters is debatable when taking into account other factors like the Apache's superior maneuverability, armament, and speed. In either case, the Apache's use in both attack and support roles in urban environments has proven effective. Apaches have been successful working in support roles with ground troops, and as an observation platform for directing artillery. Despite the Apache's weaknesses, it is currently rated as the most survivable of all military helicopters. The vast majority of Apache helicopters that have taken heavy combat damage have been able to continue their assigned missions and return safely to their bases.

Israel

The [Israeli Air Force](#) uses the Apaches as a [high-tech](#) platform to perform precision strikes with [guided missiles](#) against various targets. The AH-64A attacked and destroyed dozen of [Hizbullah](#) outposts in [Lebanon](#) during the [1990s](#), attacking in all weather conditions - day and night. During the [al-Aqsa Intifada](#), the IAF used the Apaches to target senior [Hamas](#) figures, such as [Ahmed Yasin](#) and [Adnan al-Ghoul](#) with guided missiles.

Cost and Users

The original unit cost for the AH-64A was about US\$14.5 million. In [September 2003](#), [Greece](#) ordered 12 AH-64D for a total cost of \$675 million (presumably including weapons and support), indicating a gross unit cost for the AH-64D of \$56.25 million. [Singapore](#) purchased a total of 20 AH-64D Longbow Apache aircraft in two batches between 1999 and 2001.

In addition to the U.S., Greece, and Singapore, countries which use the Apache include [Japan](#), [Egypt](#), the [Netherlands](#), [Bahrain](#), [Saudi Arabia](#), the [United Arab Emirates](#), and [Israel](#), and Jordan first, USA. The [United Kingdom](#) is using 67 WAH-64 which will operate alongside amphibious forces as necessary and have a folding blade assembly for carrier operations.

Films and media

The Apache made an appearance in several movies over the years, as it is the US's main attack helicopter. It can be seen in the following movies.

- [Fire Birds](#) (or *Wings of the Apache*) starring [Nicholas Cage](#), [Tommy Lee Jones](#), and [Sean Young](#).
- The American remake of [Godzilla](#), in which the AH-64 was modified by the movies designers to carry weapon systems not implemented by the US Army, in particular the Sidewinder missile.
- [In The Army Now](#) starring [Pauly Shore](#).
- [Toy Soldiers](#)
- Steven Spielberg's [War of the Worlds](#) starring Tom Cruise, seen attacking a Tripod.
- Stephen King adaptation [Dreamcatcher](#).
- The AH-64 appears in the Anime OVA "Read or Die".
- The helicopter has also been featured in numerous [video games](#), such as [Desert Strike](#) and [Battlefield 2: Special Forces](#).
- The AH-64 Apache has been featured in the Ace Combat Video Game series (as non-flyable aircraft)
- The Apache has also appeared in the videogame [Mercenaries: Playground of Destruction](#). The Apache in the game is a technologically advanced model with additional hardpoints, an explosive nose cannon, bigger engines and a better radar dome to track enemies' movements. This advanced model was christened the YAH-56.
- The AH-64D Longbow is the featured attack helicopter in the Janes Longbow Series of aircraft simulations. Namely Janes AH-64D Longbow and Janes Ah-64D Longbow 2.

See also

- [U.S. Army Aviation and Missile Command](#)
- [Israeli Air Force](#)
- [Royal Saudi Air Force](#)

External links

- [Janes' AH-64 page](#)
- [Apache AH-64 Peten](#) ([Israeli Air Force](#) website)
- [Apache AH-64 crashed/shot over Albania, during 1999 Kosovo war](#)
- [Footage of an AH-64 cannon engagement during the second Gulf War](#)

Agusta A109M



U.S. Coast Guard MH-68A Stingray

Description

Role	lightweight multipurpose helicopter
Crew + passengers	1/2 + 7/6

Dimensions

Length	13.04 m (main rotor to tail rotor)
Fuselage length	11.45 m
Height	3.50 m
Rotor diameter	11.00 m

Weights

Empty	1,576 kg
Maximum internal fuel	
Maximum take-off (int./ext. load)	2,850/3,000 kg

Powerplant

Engines	2 x Pratt & Whitney 206C or 2 x Turbomeca Arrius 2K1
Power	2 x 423 kW or 2 x 426 kW

Performance

Maximum speed	285 km/h
Combat range (internal fuel)	965 km/h
Ferry range (external fuel)	
Service ceiling	5,974 m
Maximum rate of climb	9.8 m/s

Armament

Gun	possibilities include 12.7 mm machine gun (250 rounds) in pod, pintle mounted 7.62 mm machine gun, door gunner post 12.7 mm machine gun
Missiles	possibilities include 2 x TOW missile launchers (2 or 4 missiles each), unguided rockets in pods (2.75" or 81 mm rockets with 7 or 12 tubes per pod), rocket/machine gun pod (70 mm x 3 rockets and 12.7 mm machine gun (200 rounds))

The **Agusta A109** is a [helicopter](#) manufactured by [Agusta](#) (now [AgustaWestland](#)) of [Italy](#). It is a light-weight, twin engine, eight seat multipurpose helicopter.

Variants

- A109A: The first production model, powered by two Allison 250-C20 turboshaft engines. It made its first flight on 4 August 1971.
 - A109A EOA "Hirundo": Military Version for the [Italian Army](#).
- A109A Mk II: Upgraded civilian version of the A109A.
- A109B: Unbuilt military version.
- A109C Hirundo (Swallow): Eight-seat civil version, powered by two Allison 250-C20R-1 turboshaft engines.
- A109K: Military version.
- A109K2: Civilian police, search and rescue version, for high altitude and high temperature operations.
- A109M: Military version.
- A109MAX: Aeromedical evacuation version.
 - A109KM: Military version for high altitude and high temperature operations.
 - A109CM: Standard military version.
 - A109LUH: Version created for the [South African Air Force](#)
 - A109HA : Version created for the [Belgian Army](#).
- A109E Power: Upgraded civilian version.
- A109S Grand: Lengthened upgraded civilian version with P&W 207 engines.
- A119 Koala: Wide-body single-engine civilian version.

The Agusta A109 is also used by the [United States Coast Guard](#) [HITRON](#) as a short range armed interdiction helicopter under the designation MH-68A Stingray.

Scandal

The sale of the Agusta A109 to the Belgian armed forces gave rise to a bribing scandal when it was revealed the company had given the Belgian Socialists over 50 million francs to get the sale. This scandal led to the resignation and conviction of NATO Secretary General [Willy Claes](#).



[Italian Army Aviation](#) A109A EOA "Hirundo"



South African Air Force A109LUH

Agusta A129 Mangusta



Description

Role: attack helicopter

Crew: 2 (pilot and weapon systems officer)

Dimensions

Length: 14.54 m (rotors turning)

Fuselage length: 12.62 m

Height: 3.35 m

Rotor diameter: 11.90 m

Weights

Empty: 2,530 kg

Maximum take-off: 5,100 kg

Powerplant

Engines: 2 x LHTEC-CTS800-2 turboshafts

Power: 2 x 946 kW

Performance

Maximum speed: 278 km/h

Combat range (internal fuel): 561 km

Ferry range (external fuel): over 1,000 km

Service ceiling: 4,725 m

Maximum rate of climb: 12.1 m/s

Armament

Gun: one three-barrel 20 mm gatling-type cannon (500 rounds)

Missiles: includes 8 x Hellfire or TOW anti-tank missiles, four pods with 81 mm (38 total) or 70 mm (2.75 in) (76 total) unguided rockets, 4/8 x Stinger or Mistral anti-aircraft missiles

The **Agusta A129 Mangusta** ([Mongoose](#)) is an attack [helicopter](#) manufactured by [Agusta](#) (part of [AgustaWestland](#)) of [Italy](#). It has the distinction of being the first attack helicopter to be designed and produced wholly in [Europe](#).

Design of the A129 began in [1978](#). The first of five Mangusta prototypes performed its initial official flight on [15 September 1983](#), and the fifth prototype first flew in March [1986](#).

The A129 Mangusta was developed to provide an anti-tank attack helicopter for the [Italian Army](#). Specifically for the export market, the A129 International was developed, this provides a more flexible and lower cost helicopter with added firepower and upgraded avionics.

The A129 can be used in the anti-armour, armed reconnaissance, ground attack, escort, fire support and anti-aircraft roles.

In the anti-armour role, the helicopter can carry either [Hellfire](#) or [TOW](#) missiles, or a mixture of both. The A129 can also be equipped with 81 mm or 70 mm (2.75 in) in unguided rockets and has a three-barrel 20 mm cannon in a turret mounted under its nose.

For the anti-aircraft role, [Stinger](#) or [Mistral](#) missiles can be carried.

The A129 is equipped with autonomous navigation and night vision systems in order to provide both day/night and all-weather combat capabilities.

It is interesting to note that the new 15-passenger [Bell/Agusta AB139](#) utility helicopter is designed around the transmission of the A129.

Users

The Italian Army is currently ([2004](#)) the sole A129 operator and is equipped with 45 A129 Mangusta versions and has ordered another 15 A129 International versions. In Italian service, the latter is referred to as the Agusta A129 CBT (combat configuration) version, the first of which was delivered in [October 2002](#).

In January 2002, [AgustaWestland](#) was awarded a contract to upgrade the first 45 A129 Mangusta versions to the multi-role Agusta A129 CBT standard.

In Italian service, the Mangusta has successfully deployed with UN missions to former Yugoslav [Republic of Macedonia](#), [Somalia](#) and [Angola](#). Three helicopters are now deployed in [Iraq](#).

Versions

- **A129 Mangusta:** Original production version, powered by two Rolls-Royce Gem 2 turboshafts.
- **A129 International:** Upgraded version with five-bladed rotor, nose turret, support for Hellfire and Stinger missiles, advanced avionics equipment and two LHTEC-CTS800-2 turboshafts.
- **A129 CBT:** Upgraded version for the Italian army that incorporates the same advances as the A129 International version, but retains the original Gem turboshaft engines

(although an uprated transmission system is fitted). It is reported that the cockpit layout is simpler than that of the A129 International.

- **A129 LBH:** A multipurpose assault helicopter version with a structure completely different from the standard A129s, having space for carrying eight soldiers in addition to the two crew. (The acronym LBH stands for Light Battlefield Helicopter.)
- **A129 Tonal:** In [1986](#), the governments of [Britain](#), Italy, the [Netherlands](#) and [Spain](#) signed a memorandum of understanding to investigate an improved version of the A129, called the *Joint European Helicopter Tonal*. (The designation "Tonal" was derived from the name of an Aztec deity.) The Tonal was to have more powerful engines, a new rotor system, retractable landing gear, improved sensors and more powerful armament. However, the project collapsed in [1990](#) when Britain and the Netherlands decided to obtain the [AH-64 Apache](#) instead.

[AgustaWestland](#) EH101

The [AgustaWestland](#) EH101 is a medium-lift [helicopter](#) originally developed as a joint venture between [Westland Helicopters](#) in the [UK](#) and [Agusta](#) in [Italy](#) for military applications but also marketed for civil use.



AgustaWestland EH101

Development

In [1977](#), the UK Ministry of Defence issued a requirement for a new [anti-submarine warfare](#) (ASW) helicopter to replace the [Royal Navy's](#) [Westland Sea Kings](#). Westland responded with a

design called the **WG.34** that was approved for development. Meanwhile, the [Marina Militare](#) (Italian Navy) was also seeking a replacement for its (Agusta-built) Sea Kings, leading Agusta to a series of discussions with Westland about the possibility of a joint development. This culminated in the joint venture being finalised in November [1979](#) and a new company (EH Industries) being formed to manage the project the following year. EH is an abbreviation for *Elicottero Helicopter*, incorporating both the English and Italian words for "helicopter." As the design studies progressed, EHI became aware of a broader market for an aircraft with the same broad capabilities required by the British and Italian navies, leading to a more generalised design that could be customised for specific customers and applications. After a lengthy development, the first prototype flew on [October 9 1987](#). EH Industries no longer exists, having been incorporated into the parent when the two companies merged.

The aircraft was manufactured at the [AgustaWestland](#) factory in [Yeovil](#).

Operators

UK



Royal Navy Merlin HM.1

The Royal Navy's final order was for 44 ASW machines, originally designated **Merlin HAS Mk.1** but soon changed to **Merlin HM Mk.1**. The first fully operational Merlin was delivered on [May 17 1997](#), entering service on [June 2 2000](#). All aircraft were delivered by the end of [2002](#).

The [Royal Air Force](#) ordered 22 transport helicopters designated **Merlin HC3**, the first of which entered service on [December 11 2000](#).

The UK is considering the Merlin as a replacement for the [Westland Sea King ASaC7](#) in the Airborne Early Warning (AEW) role.

Italy

The first Italian Navy production helicopter (M.M.I. 01) was first flown on the 4th October 1999 and it has been officially presented to the Press on the 6th December 1999 at the Agusta factory. The delivery to Italian Navy started at the beginning of 2001. The Italian Government has signed a contract to procure 16 EH101 helicopters that will be delivered to Italian Navy in the following variant: 8 anti-surface and anti-submarine (ASW) aircraft; 4 aerly-warning (AEW) aircraft; 4 utility aircraft. (see [\[1\]](#))

Canada



Canada CH-149 Cormorant

Canada has had a troubled history with the EH101. Following the lead of the UK and Italy, the Canadian government placed a [\\$4.4 billion \(CAD\)](#) order in [1987](#) for 48 (later 42) EH101s to replace the [Canadian Armed Forces's CH-124 Sea Kings](#) and [CH-113 Labradors](#). These were to be assembled in Canada under the designations **CH-148 Petrel** (33 originally, reduced to 28) and **CH-149 Chimo** (15) in the anti-submarine warfare (ASW) and air/sea search and rescue (SAR) roles respectively. The whole programme was cancelled, however, after a change of government in [1993](#), leading to the payment of \$0.5 billion in cancellation penalties.

In [1998](#), the Canadian government announced that the CH-113s would now be replaced by a new search-and-rescue variant of the EH101, carrying the designation **CH-149 Cormorant**. Unlike the Petrel/Chimo contract, these fifteen aircraft were to be built entirely in Europe. The first two aircraft arrived in Canada in September [2001](#) and entered service the following year.

When it became obvious that the Sea Kings were in need of immediate replacement, the EH101 was again part of a Canadian competition (the Maritime Helicopter Project), versus the [Sikorsky H-92](#), for a total price tag of [\\$5 billion](#). The Sikorsky entry won the competition on [July 23, 2004](#); it is to be known as the **CH-148 Cyclone**.

United States of America

Also in 2001 AgustaWestland signed a deal with [Lockheed Martin](#) to market the aircraft in the [US](#) under the designation **US101**. It competed for and won the VIP and "[Marine One](#)" Presidential transport roles currently carried out by [H-3 Sea King](#) or the smaller [UH-60 Black Hawk](#). The US101 will be built in the United States and fitted with largely American systems and equipment, [General Electric](#) turboshafts for example.

On [28 January 2005](#), the US101 was announced as the winner of the contest to supply the next Marine One helicopter for the transportation of the President and other VIPs. In doing so, it beat the [Super Hawk](#), [Sikorsky's](#) contending entry, and became the first non-Sikorsky helicopter to fulfill the Marine One role since [1957](#). The order is for 23 aircraft, to equip the Marine One squadron, [HMX-1](#).

Japan

The Tokyo Police became the first civil customer for the type when they purchased a single example in 1998. In 2003, the [Japan Maritime Self-Defense Force](#) ordered for 14 aircraft to use in the MCM (Mine Cleaning Mission) and transport role. **MCH-101**, JMSDF's temporary name, is going to replace MH-53E, for MCM and S-61, for support of the Japanese Antarctic observations.

Portugal

The [Portuguese Air Force](#) acquired 12 such aircraft in three different versions: 6 in SAR, 4 in CSAR and 2 in SIFICAP (Fisheries Control) configurations. All versions are NVG capable, the CSAR versions adding a "Defensive Aids Suite" (DAS), weapons carriage and "Air to Air Refueling" (AAR), while the SIFICAP carries the APS-717P radar.

Others

In 2001 the [Denmark](#) announced the purchase of the EH101 for SAR duties.

Specifications (Merlin HM.1)

General Characteristics

- **Crew:** four
- **Capacity:** 30 seated or 45 standing troops, or medics and 16 stretchers
- **Length:** 74 ft 10 in (22.81 m)
- **Main rotor diameter:** 61 ft 0 in (18.59 m)
- **Height:** 21 ft 10 in (6.65 m)
- **Main rotor area:** 2,992 ft² (271 m²)
- **Empty:** 23,150 lb (10,500 kg)
- **Loaded:** lb (kg)
- **Maximum takeoff:** 32,188 lb (14,600 kg)
- **Powerplant:** 3x [Rolls-Royce/Turbomeca RTM322-01 turboshafts](#), 2,312 shp (1,725 kW) each

Performance

- **Maximum speed:** 192 mph (309 km/h)
- **Range:** miles (km)
- **Service ceiling:** ft (m)
- **Rate of climb:** ft/min (m/min)
- **Main rotor loading:** lb/ft² (kg/m²)
- **Power/Mass:** hp/lb (kW/kg)

Armament

- 2x [general purpose machine guns](#)
- 960 kg (2,116 lb) of bombs and rockets

External links

- [Lockheed-Martin/Augusta-Westland/Bell-Textron Team US101 website](#)
- [Lockheed-Martin Official US101 website](#)
- [RAF page](#)
- [Canadian Air Force page](#)
- [manufacturer website](#)
- [Portuguese Air Force Official Website](#)
- [Area Militar - Unofficial PALOP Military Website](#)

Related content

Related development:

Comparable aircraft: [NHI NH90](#) - [Sikorsky S-92](#)

Designation sequence:

See also:

- [European defence procurement](#)

Ansats

The **Ansats** is a [Russian](#) light multipurpose [helicopter](#) manufactured by [Kazan Helicopters](#).

Development

Kazan Helicopters in [Kazan](#) has been one of main Russian manufacturers of helicopters of [Mikhail Mil](#) bureau design. In [1990s](#), the management realized, that there would be need for light helicopters in Russia, as the fleet of standard [Mi-2](#) was getting older, and design itself became obsolete. The Mi-2 was the lightest helicopter mass-used in the former [USSR](#), despite it was twice bigger, than light Western helicopters. First Kazan Helicopters wanted to develop a helicopter basing on the [AS 350 Ecureuil](#) in cooperation with [Eurocopter](#), but it failed.

As a result, in [1993](#) Kazan Helicopters organized its own design bureau, in order to create a new helicopter (the bureau was officially certified by the Russian authorities in January 1997). The helicopter was named **Ansats** (meaning "light" in [Tatar language](#)). Since there were no proper Russian engines available, the designers decided to use Western ones. In [1998](#), the first prototype for ground static tests was completed. The second prototype (no. 02, then 902) first flew on August 17, [1999](#), but the first official flight was made on October 6, 1999. It was powered by two engines [Pratt & Whitney Canada PW206](#). Another prototype, with longer and slimer fuselage, and powered with [PW207K](#) engines, flew on December 27, [2001](#) (no. 03, then 904). The third prototype introduced side doors of transport compartment opening upwards and downwards, instead of sliding ones. It was offered as a military trainer variant **Ansats-UT** with dual controls.

The Ansat-UT won a contest for a trainer helicopter for the [Russian Air Force](#) in 2001, and there are planned orders. Serial Ansat-UT's are to be fitted with wheeled [landing gear](#), instead of skis.

As for [2005](#), apart from the fourth prototype, Ansat has not been built in any bigger quantity. From 2002, it undergoes certification process. It is offered by Kazan Helicopters for Russian and foreign market, and for the Russian Air Force. Estimated price is about 2-2.5 million USD.

There are projected Ansat variants: Ansat-M [air ambulance](#) for two [stretchers](#) and Ansat-UM military [medevac](#) for 4 stretchers.

Basing on Ansat technology, there are also projected further helicopters under Ansat brand: [Ansat-2RC](#) - a light military reconnaissance helicopter with narrow fuselage and two-men crew in tandem, and [Ansat-3](#) Maximum - medium transport helicopter for 17 passengers.

Technical description

Helicopter of a classic construction. It takes a pilot and 10 passengers (one of them seats next to the pilot). A fuselage has a pair of doors in pilot's cab, and a pair of upwards and downwards opening side doors in transport compartment. After dismounting seats, it can take 1000 kg of cargo inside. On external hook, it can take 1300 kg of load. Powered with two [turboshaft](#) engines [Pratt & Whitney Canada PW207K](#), 630 shp. Four-blade main rotor. Two-blade rear rotor.

Specifications

General Characteristics

- **Crew:** one pilot
- **Capacity:** 10 passengers
- **Length (with main rotor):** 13.64 m (ft in)
- **Length (fuselage):** 11.18 m (ft in)
- **Main rotor diameter:** 11.50 m (ft in)
- **Height:** 3.50 m (ft in)
- **Main rotor area:** m² (ft²)
- **Empty:** kg (lb)
- **Loaded:** 3,000 kg (lb)
- **Maximum takeoff:** 3,300 kg (lb)
- **Powerplant:** 2x PW207K [turboshaft](#), 630 shp

Performance

- **Maximum speed:** 280 km/h (mph)
- **Range:** 635 km (mph)
- **Service ceiling:** 5,700 m (ft)
- **Rate of climb:** 16 m/s (ft/min)
- **Main rotor loading:** kg/m² (lb/ft²)
- **Power/Mass:** kW/kg (hp/lb)

Atlas Alpha XH-1



Alpha XH-1

The **Alpha XH-1** was a prototype attack helicopter built by [Atlas Aviation](#) (now [Denel Aviation](#)) of [South Africa](#), which used it as a concept demonstrator for the then-planned Rooivalk project.

It was developed from an [Alouette III](#) airframe, retaining that helicopter's engine and dynamic components, but replacing the original cockpit with a stepped tandem one, adding a 20mm cannon on the nose and converting the undercarriage to tail-dragger configuration.

The XH-1 first flew on [3 February 1985](#), and soon embarked on a rigorous flight test program to examine the feasibility of a dedicated attack helicopter in southern [African](#) conditions. The results were ultimately good enough to convince Atlas and the [South African Air Force](#) to go ahead with the development of a dedicated attack helicopter - the [Rooivalk](#). It should be noted however that the XH-1 and Rooivalk are completely different aircraft and share no components (the Rooivalk was developed from the later XH-2 prototype).

The sole XH-1 was retired sometime in the late 1980s and was handed over to the [South African Air Force Museum](#), where it remains to this day.

Specifications (XH-1)

General Characteristics

- **Crew:** two, pilot and gunner
- **Fuselage length:** 10.56 m (34.64 ft)
- **Main rotor diameter:** 11.02 m (36.15 ft)
- **Height:** 2.73 m (8.6 ft)
- **Main rotor area:** m² (ft²)
- **Empty:** 1,400 kg (3,086 lb)
- **Loaded:** kg (lb)
- **Maximum takeoff:** 2,200 kg (4,850 lb)
- **Powerplant:** 1 x [Turbomeca Artouste III](#)B turboshaft, 410 kW (550 shp)

Performance

- **Maximum speed:** 200 km/h (124 mph)
- **Range:** 550 km (344 miles)
- **Service ceiling:** m (ft)
- **Rate of climb:** m/min (ft/min)
- **Main rotor loading:** kg/m² (lb/ft²)
- **Power/Mass:** kW/kg (hp/lb)

Armament

- 1x [Vektor GA-1 Rattler](#) cannon in a chin turret with 1000 rounds

Related content

Related development: [Aérospatiale Alouette III](#)

Atlas Oryx



Oryx M2

The **Atlas Oryx** (named after the [Oryx antelope](#)) is a medium-sized utility [helicopter](#) manufactured by the Atlas Aircraft Corporation (now Denel Aviation) of [South Africa](#). It is an upgraded and remanufactured version of the [Aérospatiale Puma](#), equivalent to the [Eurocopter Super Puma](#), and offers a performance improvement over the original, in addition to cutting the operating costs by 25 to 30%.

The Oryx is currently in service with several squadrons of the [South African Air Force](#), with about 44 being available.

It can carry up to 20 fully equipped troops or 6 wounded on stretchers with 4 attendants or 3,000 kg freight carried in the cabin or 4,500 kg freight on an external sling.

There is also an [electronic warfare](#) (stand-off communications jamming/radar jamming) version of the Oryx that is equipped with the Grinaker Systems Technologies (GST) GSY 1501 jamming system, among others.

Two Oryx helicopters have also been modified for operations in the [Southern Ocean](#) and the [Antarctic](#), for which they have been painted in the red and white colour scheme as illustrated in the photograph accompanying this article. These two aircraft have been given the designation of **Oryx M2**.

Specifications

General Characteristics

- **Crew:** 3
- **Capacity:** 20 fully-equipped troops
- **Length:** 18.74 m (main rotor to tail rotor)
- **Fuselage length:** 15.45 m
- **Height:** 5.14 m
- **Rotor diameter:** 15.6 m
- **Empty:** 3,600 kg
- **Loaded:** 6000 kg
- **Maximum takeoff:** 8000 kg
- **Engines:** 2 x Turbomeca Makila IA1 turboshafts, 1400 kW each

Performance

- **Maximum speed:** 165 kts (306 km/h)
- **Combat range (internal fuel):** 303 nm (561 km)
- **Ferry range (external fuel):** 1080 nm (2000 km)
- **Service ceiling:** 23 500 ft (7 162 m)
- **Rate of climb:** 3000 ft/m (915 m/min)

Armament

- **Guns** 2 x door-mounted 7.62mm machine guns (optional)

Aérospatiale Alouette II



Alouette II

Description

Role	light helicopter
Crew	1 pilot, four passengers
First Flight	1955
Entered Service	1957
Manufacturer	Sud Aviation

Dimensions

Length	9.70 m
Rotor diameter	10.20 m
Height	2.75 m
Wing area	81.7 m ²

Weights

Empty	895 kg
Loaded	kg
Maximum takeoff	1 600 kg

Powerplant

Engines	1 x Turboméca Artouste IIC6 turboshaft, 410 kW (550 hps)
Thrust	kN

Performance	
Maximum speed	185 km/h
Combat range	565 km
Ferry range	km
Service ceiling	2 250 m
Rate of climb	252 m/min
Wing loading	kg/m ²
Thrust/Weight	N/kg
Missiles	

The **Alouette II** is a light [helicopter](#) originally manufactured by [Sud Aviation](#) and later [Aérospatiale](#) of [France](#). The Alouette II has the honour of being the first helicopter that used a gas turbine instead of a conventional heavier piston engine.

It was mostly used for military purposes in observation, photography, air/sea rescue, liaison and training but it has also carried anti-tank missiles and homing torpedoes. As a civilian helicopter it was put to use as a casualty evacuation (with two external stretcher panniers), crop-spraying and flying crane (with a 500kg external sling load).

History

Although Sud-Est's previous helicopter design, the [SE.3120 Alouette](#), broke helicopter speed and distance records in July [1953](#), it was too complex an aircraft to market successfully. With the records falling, the French government started showing interest but with their financial backing the state gave an ultimatum that within 2 years a helicopter had to be in production otherwise all activities around rotary wings would cease! SNCASE came up with 7 turbo-engine helicopters designs: X.310A - X.310G. Earlier [Joseph Szydlowski](#), the founder of [Turboméca](#) had successfully managed to develop the [Artouste](#), a 260 hp single shaft turbine engine derived from his [Orédon](#) turbine. The X.310G design was chosen and together with the Artouste engine was fast tracked towards production as the **SE.3130 Alouette II**.

The SE-3130, first flew on [March 12 1955](#) and within 3 months a pre-series Alouette II flown by [Jean Boulet](#) set a new helicopter altitude record of 8,209 m on [June 6](#) then on [June 13](#) pushed the record even further to 10,984 m.

The Alouette II made the news on [July 3 1956](#) when it became the first helicopter to perform a mountain-rescue by evacuating a mountaineer who had suffered from cardiac arrest at over 4,000 m and again on [January 3 1957](#) the Alouette II was called upon to rescue the crew of a crashed [Sikorsky S-58](#) which was searching for missing mountaineers Jean Vincendon and François Henry on [Mont Blanc](#).

The Alouette II gained its domestic certificate of airworthiness on [May 2 1957](#).

Production started initially to fulfil orders from the French armed forces and civilian customers, but by the time production ended in [1975](#) with over 1500 Alouette II's had been built and in use in over 80 countries including 47 armed forces. It is also licence built in [Sweden](#), [India](#) and in the [United States](#).

In [1963](#) the Alouette II became the first commercially operated turbine helicopter in the USA.

Versions



SE.3130 Alouette II - After [1967](#) called **SA.313B Alouette II**

- **SE.3131 Gouverneu** - VIP version which led up to the [Alouette III](#)
- **SE.3140 Alouette II**
- **HKP 2 Alouette II** - [Swedish](#) licence version of the SE.3130
- **SE.3150 Alouette Astazou** - It has a 550 shp Turboméca Astazou IIA shaft turbine (derated to 360 shp) and strengthened transmission system of the [Alouette III](#)
- **SE.3180 Alouette II** - After [1967](#) called **SA.318C Alouette II** derived from the SE.3150
- **HAL Chetak** - [Indian](#) licence version of the SE.3180
- **SA-315B Lama** - Derived from the SE.3150, it was designed for high altitude operations using a 650kW (870shp) Turboméca Astazou IIIB turboshaft, derated to 410kW (550shp). This derivative still holds the absolute altitude record for all types of helicopters since 1972: 12,442 m.
- **HAL Cheetah** - Indian licence version of the SA.315B Lama
- **HAL Lancer** - modified and updated version of Cheetah.

Users

[Austria](#) (16), [Belgium](#) (39), [Cambodia](#) (8), [Congo](#) (3), [Côte d'Ivoire](#) (2), [Dominican Republic](#) (2), [France](#) (363), [Germany](#) (267), [India](#), [Indonesia](#) (3), [Israel](#) (4), [Laos](#) (2), [Lebanon](#) (3), [Mexico](#) (2), [Morocco](#) (7), [Netherlands](#) (8), [Peru](#) (6), [Portugal](#) (7) and [South Africa](#) (7), [Sweden](#) (25), [Switzerland](#) (30), [Tunisia](#) (8), [United Kingdom](#) (17)

Related content

Related development:

Comparable aircraft:

Designation sequence: [SE.310](#) - [SE.311](#) - [SE.312](#) - **SE.313** - **SE.314** - [SE.315](#) - [SE.316](#) - **SA.318** - [SA.319](#) - [SA.320](#) - [SA.321](#)

See also:

- [List of civil aircraft](#)

Aérospatiale Alouette III

The **Aérospatiale Alouette III** is a general purpose, single-engined light utility [helicopter](#) originally manufactured by [Aérospatiale](#) of [France](#) (now [Eurocopter](#)). It was mostly used for military purposes, although civilian versions also flew. It is recognised for its mountain rescue capabilities and adaptability. The Alouette III is powered by a Turbomeca Artouste 3B Turbo-Shaft. The Alouette III first flew in 1959 and entered in service with the French Armed forces in 1960.

History

The Alouette ([skylark](#)) III is the successor to the [Aérospatiale Alouette II](#), compared to which it is larger and has more seating. In turn, both of these helicopters can trace their ancestry back to the [Sud-Est Aviation SE-3120 Alouette](#) piston powered prototypes, the first of which flew for the first time on [31 July 1951](#).

The first version of the Alouette III, the SE-3160 prototype, first flew on [28 February 1959](#), powered by the Turboméca Artouste turboshaft. The SA-316A (SE-3120) was the first production model, it remained in production until [1969](#), when it was replaced by the SA-316B.

The SA-316B had a strengthened transmission and a greater maximum takeoff weight, but retained the Turboméca Artouste turboshaft.

The SA-319B entered production in [1968](#), powered by the Turboméca Astazou XIV turboshaft, which had a better "hot and high performance" and improved fuel economy.

The SA-316B and the SA-319B both remained in series production up to the early 1980s, when the main production line in France was closed down. However, [HAL](#) of India continues to licence-build Alouette IIIs as the [Chetak](#). Versions of the Alouette III were also either licence-built or assembled by ICA in Romania, F+W Emmen in Switzerland and by [Fokker](#) and Lichtwerk in the [Netherlands](#).

Production numbers are as follows:

- France: ca. 1500
- India: 300+ (Still in production.)
- Romania: 200
- Switzerland: 60

Users

- Albania (SA 319)
- Argentina (SA 316)
- Austria (SA 316)
- Austria (SA 319)
- Belgium (SA 319)
- Burundi (SA 316)
- Cameroon (SA 319)
- Chad (SA 316)
- Chile (SA 316)
- Congo, Democratic Republic of the (SA 316)
- Congo, Republic of the (SA 316)
- Ecuador (SA 316)

- Ethiopia (SA 316)
- France (SA 316)
- France (SA 319)
- Ghana (SA 316)
- Greece (SA 319)
- Guinea-Bissau (SA 316)
- India (SA 319)
- Indonesia (SA 316)
- Iraq (SA 316)
- Ireland (SA 316)
- Jordan (SA 316)
- Lebanon (SA 316)
- Libya (SA 316)
- Malaysia (SA 316)
- Malta (SA 316)
- Mexico (SA 319)
- Pakistan (SA 316)
- Pakistan (SA 319)
- Peru (SA 319)
- Portugal (SA 319)
- Romania (SA 319)
- Rwanda (SA 316)
- South Africa (SA 316)
- Suriname (SA 316)
- Switzerland (SA 316)
- Tunisia (SA 316)
- Venezuela (SA 316)
- Zimbabwe (SA 316)

Versions

While the SA-316B has a 425 kW (570 shp) Turboméca Artouste IIIB turboshaft driving a three blade main rotor and three blade tail rotor, the SA-319B has a 450 kW (600 shp) derated Turboméca Astazou XIV turboshaft. The SA-316B was built under licence in India as the HAL Chetak, and again under licence in Romania as the [IAR-316B](#). The SA-316C was powered by a Turbomeca Artouste IIID turboshaft engine. When used as an aerial ambulance, the Alouette III can accommodate a pilot, two medical attendants and two stretcher patients. Sadly on June 2004, the Alouette III was retired from the French Air Force after 32 years of successful service. It will be replaced by the Eurocopter Ec -155 Twin Squirrel. In the same year, the Swiss Armed Forces announced the retirement of the Alouette III, from the front line by 2006, and entirely by 2010. Venezuelan Air forces retired the Alouette III in the late 90's.

See also

- [List of civil aircraft](#)



South African Air Force
Aérospatiale Alouette III



An **Alouette III** on
the [frigate La Motte-
Picquet](#).



Close-up of the
turbine of an
Alouette III



An **Alouette III** of the 22S
wing of the [French Navy](#)
on the landing pad of Lanvéoc
base



The landing bridge of
the [Jeanne d'Arc](#) with
Alouette III helicopters

Aérospatiale Gazelle



The **Gazelle** is a [helicopter](#) developed as part of an [Anglo-French](#) venture between the [Westland](#) and [Aérospatiale](#) companies in 1968.

One of the fastest helicopters ever built, it served with all branches of the British armed forces - the [Royal Air Force](#), [Royal Navy](#) including [Royal Marines](#) and the [British Army](#) in a variety of roles. It served with other forces worldwide. Four versions of the Gazelle were used by the British Forces. The **SA341D** became the **Gazelle HT.3** in RAF service, equipped as a helicopter pilot trainer (hence HT). The **SA 341E** was used for communications duties and [VIP](#) transport and as the **Gazelle HCC.4**. The **SA 341C** was purchased for as the **Gazelle HT.3** pilot trainer for the [Royal Navy](#). The **SA 341B** was equipped to a specification for the [Army Air Corps](#) as the **Gazelle AH.1** (from **Attack Helicopter Mark 1**).

It has served the British in combat in the [Falkland Islands](#), [Kuwait](#), [Iraq](#) and [Kosovo](#). In French ALAT service, variants are also equipped with the Mistrale air-to-air missile and a 20 mm cannon.

It was used for anti-tank helicopter operations and also for a wide variety of supporting roles - Air Observation Post (AOP) for directing artillery fire, Airborne Forward Air Controller (ABFAC) directing ground-attack aircraft, casualty evacuation, liaison, and command and control, and communications relay.

Gazelles were also manufactured in [Egypt](#) by [ABHCO](#) and in [Yugoslavia](#) by [SOKO](#).

A Gazelle starred as a modified high-tech attack helicopter in the 1982 action-thriller film [Blue Thunder](#). Also, was seen in [Rambo III](#) as a light attack [Russian](#) helicopter.

Specifications (SA 341)

General Characteristics

- **Crew:** two
- **Length:** 9.53 m (31 ft 3 in)
- **Main rotor diameter:** 10.50 m (34 ft 5 in)
- **Height:** 3.18 m (10 ft 5 in)
- **Main rotor area:** 87 m² (932 ft²)
- **Empty:** 998 kg (2,196 lb)
- **Loaded:** kg (lb)
- **Maximum takeoff:** 1,800 kg (3,960 lb)
- **Powerplant:** 1x [Turbomeca Astazou](#) IIIB [turboshaft](#), 590 shp (440kW) each

Performance

- **Maximum speed:** 310 km/h (193 mph)
- **Range:** 670 km (419 miles)
- **Service ceiling:** 4,100 m (13,448 ft)
- **Rate of climb:** 732 m/min (2,400 ft/min)
- **Main rotor loading:** kg/m² (lb/ft²)
- **Power/Mass:** kW/kg (hp/lb)

External links

- [British Army Gazelle page](#)
- [British Army Air Corps? Helicopter Display Team](#)

Related content

Related development:

Comparable aircraft:

Aérospatiale Puma



SA 330 Puma

Description

Role	Medium transport/utility helicopter
Crew	3
First Flight	
Entered Service	
Manufacturer	

Dimensions

Length	ft in	18.15 m
Rotor Diameter	ft in	15.0 m
Height	ft in	5.14 m

Weights

Empty	lb	3,770 kg
Loaded	lb	Kg
Maximum Takeoff	lb	7,400 kg
Capacity		16 passengers

Powerplant

Engines	2 x Turbomeca Turmo IVC turboshafts	
Power	hp	2 x 1,175 kW

Performance

Maximum Speed	mph	258 km/h
Combat Range	309 nautical miles	km
Ferry Range	miles	km
Service Ceiling	ft	4,800 m
Rate of Climb	ft/min	552 m/min
Thrust/Weight Power/Mass	hp/lb	kW/kg

Avionics

Avionics

Armament

Guns	Various, including co-axial 7.62 mm machine guns and side-firing 20 mm cannon
Bombs	
Missiles	
Rockets	
Other	

The **Aerospatiale Puma** is a medium-sized twin-engined transport/utility [helicopter](#) originally manufactured by [Aerospatiale](#) of [France](#). It is also known under the designation SA 330.

History

The SA 330 Puma was originally developed by Aerospatiale to meet a requirement of the French Army for a medium-sized all-weather helicopter. The helicopter also had to be capable of operating by day and night as well as in a wide variety of climates.

In 1967, the Puma was also selected by the [Royal Air Force](#) (RAF) and given the designation *Puma HC Mk. 1*. As a result of this decision, the SA 330 was included in a joint production agreement between Aerospatiale and [Westland](#) Helicopters of the UK.

The first of two Puma prototypes flew on [15 April 1965](#). Six pre-production models were also built, the last of which flew on [30 July 1968](#).

The first production SA 330 Puma flew in September [1968](#). On [25 April 1978](#) the SA 330J Puma achieved the distinction of becoming the first helicopter outside the (then) Soviet Union to be certificated for all-weather operations, including icy conditions.

Production of the SA 330 Puma by Aerospatiale ceased in 1987, by which time a total of 697 had been sold. The Puma was then replaced by an upgraded and improved version, the AS 332 [Eurocopter Super Puma](#).

Variants of this helicopter were also manufactured, assembled or licence-built by the Atlas Aircraft Corporation of South Africa, ICA of Romania and IPTN of Indonesia.

Users

The SA 330 Puma is one of the most widely used helicopter types in the world. Versions of this helicopter are or were in service with the armed forces of the following countries:

- [Argentina](#)
- [Brazil](#)
- [Cameroon](#)
- [Chile](#)
- [Côte d'Ivoire](#)
- [Ecuador](#)
- [Ethiopia](#)
- [France](#)
- [Gabon](#)
- [Indonesia](#)
- [Iraq](#)
- [Kenya](#)
- [Kuwait](#)
- [Lebanon](#)
- [Malawi](#)
- [Mexico](#)
- [Nepal](#)
- [Nigeria](#)
- [Pakistan](#)
- [Portugal](#)
- [Romania](#)
- [Senegambia](#)
- [South Africa](#)
- [Spain](#)
- [Sudan](#)
- [Togo](#)
- [United Arab Emirates](#)
- [United Kingdom](#)
- [Zaire](#)

The Puma is also operated by several civilian operators.

Versions



Westland Puma HC1 of the RAF

Aerospatiale versions

- SA 330 A: Prototypes, originally called "Alouette IV".
- SA 330 B: Initial production version.
- SA 330 "Orchidee": SA 330 modified to carry an "Orchidee" surveillance system for the French Army.
- SA 330 C: Initial export production version.
- SA 330 E: Version produced by Westland Helicopters for the RAF under the designation HC Mk 1.
- SA 330 F: Initial civilian export production version with Turbomeca Turmo IIIC4 turboshaft engines.
- SA 330 G: Upgraded civilian version with Turbomeca Turmo IVC engines and composite main rotor blades.
- SA 330 H: Upgraded French Army and export version with Turbomeca IVC engines and composite main rotor blades.
- SA 330 J: Upgraded civil transport version.
- SA 330 L: Upgraded version for so-called "hot and high" conditions.
- SA 330 Z: Prototype with "fenestron" tail rotor.

Versions by other manufacturers

- Atlas Aircraft Corporation [Oryx](#): This is a remanufactured and upgraded SA 330 Puma built for the [South African Air Force](#).
- ICA IAR 330 L: This is a licence-built version of the SA 330 Puma manufactured by ICA of [Romania](#). Designated as the SA 330 L by Aerospatiale.
- IPTN NAS 330 J: This is a version that was assembled by IPTN of [Indonesia](#) under the local designation NAS 330 J and the Aerospatiale designation of SA 330 J. Eleven units were produced.
- Westland Puma HC Mk. 1: This is the SA 330 E version assembled by Westland Helicopters for the RAF.

Aérospatiale Super Frelon



Aérospatiale Super Frelon

The **Aérospatiale Super Frelon** was a heavy transport helicopter produced by [Aérospatiale of France](#), now out of production.

Both civilian and military versions of the Super Frelon were created, with the military variants being the most numerous by far, entering service with the French military as well as being exported to [Israel](#), [South Africa](#), [Libya](#), [China](#) and [Iraq](#).

Three military variants were produced; military transport, anti-submarine and anti-ship.

The transport version is able to carry 38 equipped troops, or alternatively 15 stretchers for casualty evacuation tasks.

The Naval anti-submarine and anti-ship variants are usually equipped with a navigation and search [radar](#) (ORB-42), and a 50 metre rescue cable. They are most often fitted with a 20 mm cannon, counter-measures, night vision, a laser designator and a Personal Locator System. It can also be refueled in flight.



A *Super Frelon* taking off from the flying deck of the [Clémenceau](#)



A *Super Frelon* helicopter of the 35F wing of the [French Navy](#)



A *Super Frelon* helicopter of the 32F wing, landing on the *Ouragan*



A *Super Frelon* helicopter n°165 of the 32F Wing flying over Portsmouth



A *Super Frelon* on the landing deck of the [Jeanne d'Arc](#)

Specifications (Naval variant)

General characteristics

- **Crew:** 5
- **Capacity:** 27 passengers/15 stretchers
- **Length:** 23.03 m (75 ft 6.7 in)
- **Main rotor diameter:** 18.90 m (62 ft)
- **Height:** 6.66 m (22 ft 2.1 in)
- **Empty:** 6,863 kg (15,130 lb)
- **Loaded:** kg (228,660 lb)
- **Maximum takeoff:** 13,000 kg (lb)
- **Powerplant:** 3 Turboméca 3C III turbines, 1,171 kW (1,570 hp)

Performance

- **Maximum speed:** 248 km/h (154 mph)
- **Range:** 1,000 km (miles)
- **Service ceiling:** m (ft)
- **Rate of climb:** 300 m/min (ft/min)
- **Endurance:** 4 hours

Armament

- **Gun:** 1x 20 mm cannon
- **Missiles/Torpedoes:** Four homing torpedoes in the ASW role or two [Exocet](#) missiles in the anti-ship role