

## **AH-1W / AH-1Z SUPER COBRA ATTACK HELICOPTER, USA**



**AH-1Z COMPLETES ITS FIRST TEST FLIGHT 7TH DECEMBER 2000.**

The AH-1W Super Cobra is the US Marine's attack helicopter. It is supplied by Bell Helicopter Textron and entered service in 1985. As well as the US Marine Corps, the Super Cobra is operational with the Turkish Land Forces and the armed forces of Taiwan. The AH-1W was deployed in support of Operation Iraqi Freedom in March 2003.

### **AH-1Z UPGRADE PROGRAMME**

A major upgrade of the Bell Super Cobra, known as the H-1 Program, is underway. The program calls for the remanufacture of the US Marine Corps fleet of 180 AH-1W Super Cobra and 100 UH-1N utility helicopters to an advanced four-bladed configuration. The existing two-bladed semi-rigid, teetering rotor system is being replaced with a four-bladed, hingeless, bearingless rotor system. First flight of the AH-1Z took place in December 2000. The AH-1W entered Low Rate Initial Production (LRIP) in October 2003. Three AH-1W helicopters were remanufactured to AH-1Z standard and are in flight testing at NAS Patuxent River, Maryland. Sea trials in May 2005 included the first shipboard landing on USS Bataan, Wasp Class amphibious assault ship. One AH-1Z was delivered to the USMC in October 2005 to begin Operational Evaluation (OPEVAL) in early 2006. Full-rate production is scheduled for 2006 with initial operating capability in June 2009. The improvement in flight characteristics provided by the four-bladed configuration has led to increases in flight envelope, maximum speed, vertical rate-of-climb, payload and rotor vibration level.

The Turkish Army selected the AH-1Z King Cobra in July 2000 with a request for 50 out of a total requirement for 145 helicopters. In May 2004, it was announced that the acquisition was to be cancelled. The helicopters were to be built in Turkey by Tusas Aerospace Industries (TAI).

### **COCKPIT**

Northrop Grumman has developed the Integrated Avionics Systems for the AH-1Z. The systems include two mission computers and an automatic flight control system with four-axis stability control augmentation system. Each crew station has two 8in x 6in multifunction displays and one 4.2in x 4.2in dual function display, based on active matrix liquid crystal colour technology.

The communications suite combines the new US Navy RT-1824 integrated radio, UHF/VHF, COMSEC and modem in a single unit. The navigation suite includes an Embedded GPS Inertial (EGI), a low airspeed air data subsystem which allows weapons delivery when hovering and digital map.

In June 2002, Thales Avionics' TopOwl helmet-mounted display system was chosen for the USMC AH-1Z. The first system was delivered in January 2003. TopOwl, also fitted on Tiger, NH90 and Rooivalk helicopters, has integrated Gen IV image intensifier and FLIR capability and provides transition from day to night use at the push of a button.

## **WEAPONS**

The Super Cobra can carry both TOW and Hellfire anti-armour missiles and is being qualified to carry the Maverick missile. The Raytheon BGM-71 TOW missile has a range of more than 3km and semi-automatic command-to-line-of-sight guidance. The AGM-114 Hellfire missile is manufactured by Lockheed Martin. It is equipped with a semi-active laser seeker and has a range of 7km. The Super Cobra has fire-and-forget capability when firing the Hellfire missile in co-operative mode with laser target illumination.

The Super Cobra was the first attack helicopter to qualify both the Sidewinder air-to-air missile and the Sidearm anti-radiation missile. Both missiles can use the same LAU-7 rail launcher. Sidearm has a range of more than 15km. AIM-9L Sidewinder is an all-aspect short-range air-to-air missile produced by Lockheed Martin and Raytheon. The missile has a range of 15km.

The Super Cobra can fire the Advanced Precision Kill Weapon System (APKWS), formerly known as Hydra, family of guided and unguided 70mm rockets or the larger 127mm Zuni rocket bombs.

The Super Cobra carries a three-barrel 20mm Gatling gun for close range (up to 2km) engagement and 750 rounds of ammunition. With the gun in a fixed forward position, the pilot can aim by maneuvering the helicopter. Either crew member can slave the turret to the helmet-mounted sight, and aim the gun by looking at the target.

The AH-1Z for the USMC will be armed with: 16 Hellfire missiles, six AIM-9 Sidewinder air-to-air missiles, 70mm rocket pods (7- and 19-shot), as well as the 20mm gun.

## **SENSORS**

Targeting for the AH-1W is provided by the Night Targeting System (NTS), jointly produced by Tamam Division of Israel Aircraft Industries Ltd and Kollsman. NTS integrates a Forward Looking Infrared (FLIR) which provides automatic target tracking with a laser designator / rangefinder and video recorder.

Lockheed Martin is developing a longer range Target Sight System (TSS) for the AH-1Z to replace the NTS. TSS includes a third-generation four field-of-view FLIR based on a 3-5 micron staring array, CCD colour TV, eye safe laser rangefinder / designator and multi-target auto tracker.

Longbow International (a joint venture of Lockheed Martin and Northrop Grumman) is developing the Cobra Radar System for the AH-1Z, based on the Longbow millimetre wave radar on the AH-64D Apache. Cobra is a pod-based radar that can be mounted on a wingtip or in a stores position. Cobra can automatically search, detect, classify and prioritise multiple moving and stationary targets. It has a range of 8km against moving and 4km against stationary targets.

## COUNTERMEASURES

The H1 Super Cobra upgrade includes provision of a new electronic warfare suite. A new radar warner, the AN/APR-39(XE2) from Lockheed Martin replaces the Lockheed Martin AN/APR-39(V)2 pulse radar warner and the AEL Industries AN/APR-44 continuous wave radar warner. The ATK AN/AAR-47 missile warning system has been included in the upgrade suite. AN/AAR-47 uses infrared detectors to detect the missile plume. The Goodrich (formerly Raytheon) AN/AVR-2A laser warning receiver has also been added. The infrared countermeasures system is the AN/ALQ-144A developed by BAE Systems IEWS (formerly Sanders, a Lockheed Martin company). The helicopter is equipped with the AN/ALE-39 chaff and infrared flare dispenser manufactured by BAE Systems Integrated Defense Solutions (formerly Tracor) and Lockheed Martin Tactical Defense Systems.

## ENGINES

Twin General Electric T700-GE-401 turboshaft engines provide a total of 2,410kW or 3,380shp (shaft horsepower). In standard conditions, with an air-to-air ordnance load the Super Cobra can take off and climb out at more than 4.1m/sec on only one engine. It can hover Out of Ground Effect (OGE) at 914m with a load of four TOW and four Hellfire missiles, full turret ammunition and rockets.

## SPECIFICATIONS - AH-1W / AH-1Z SUPER COBRA ATTACK HELICOPTER, USA

### Dimensions

Length	13.9 metres
Height	4.02 metres
rotor diameter	14.63 metres

**Powerplant** 2 general electric T700-401 rated at 1,625 shp

### Weight

empty weight	12,200 lbs (10,920 lbs)
maximum gross weight	16,800 lbs (14,750 lbs)
internal fuel	2755 lbs(2,086 lbs)
maximum ordnance	3,914 lbs (1,661 lbs)
hovering out of ground effect (HOGE) gross weight	16,600 lbs (10,300 lbs)

### Performance

maximum airspeed	210 knots (170 knots)
cruise speed at altitude 3,000 ft and 91.5 deg F	148 knots (137 knots)
cruise speed at altitude 4,000 ft and 95 deg F	137 knots (131 knots)
maximum range with 20 minutes reserve fuel	350 nautical miles
endurance with 20 minutes reserve fuel	3 hours 30 minutes (2 h 48 min)
maximum g-load	+3.2 g (+2.5g)

minimum g-load	-0.5 g (+0.5g)
vertical rate of climb at altitude 3,000 ft	1,740 ft/minute (645 ft/minute)
vertical rate of climb at altitude 4,000 ft	1,386 ft/minute (315 ft/minute)
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**The Super-Cobra AH-1W is the United States Marine's attack helicopter.**





**2 Super Cobra AH-1W Attack Helicopters.**



**The H-1 program upgrades the US Marine Corps fleet of AH-1W Super-Cobra and the UH-1N utility helicopters.**



**Super Cobra firing the AGM-65 Maverick air-to-surface missile.**



**AH-1W Super Cobra is amongst the world's most versatile Attack Helicopters.**





**A new glass cockpit has been developed for the Super Cobra**



**A Super Cobra AH-1F armed with TOW missiles.**