RAH-66 Comanche

Description		
Role	Reconnaissance/Attack	
Crew	2	
Dimensions		
Length	13.22 m	
Wingspan	11.90 m	
Height	3.39 m	
Wing area		
Weights		
Empty	3402 kg	
Loaded		
Maximum take-off	7790 kg	
Powerplant		
Engines	2 × Turboshaft engine - LHTEC T800	
Power	2688 hp	2,004 kW
Performance		
Maximum speed	328 km/h	
Combat range		
Ferry range		
Service ceiling		
Rate of climb	360 m/min (6 m/s)	
Armament		
Guns	XM301 three-barrel 20 mm cannon, 500 rounds	
Missiles	Internal bay: 4 Hellfire + 2 Stinger (ATAS); Total: 14 Hellfire / 28 Stinger	
Rockets	Total: 56 Hydra 70 70 mm air-to-ground rds	

The **Boeing-Sikorsky RAH-66 Comanche** was an advanced U.S. Army military helicopter intended for the armed reconnaissance role, incorporating stealth techniques. Had it entered service, it would have been the first U.S. helicopter specifically designed for the all-weather armed scout mission and the first 'stealth' helicopter, but it was cancelled in February 2004.

Development

The Army currently has an armed scout helicopter in its fleet — the OH-58D Kiowa Warrior – but that aircraft is an upgraded version of a Vietnam-era observation helicopter. In contrast, the Comanche was specifically tailored to the role of armed scout. It is smaller and lighter than the Apache gunship -- 43 feet (13.1 m) long and 7,700 pounds (3,500 kg) vs. 51 feet (15.5 m) and 11,400 pounds (5,200 kg) – and its composite material airframe incorporated stealth features to avoid detection, such as retractable weapon stations and main gun, faceting and RAM. Its noise signature was also noticeably small compared with other helicopters on its class.

The Comanche's very sophisticated detection and navigation systems were intended to allow it to operate at night and in bad weather, which the Kiowa Warrior cannot do effectively. Its airframe was designed to fit more easily than the Apache into transport aircraft or onto transport ships, enabling it to be deployed to hot spots quickly. If transport assets were not available, the Comanche's ferry range of 1,260 nautical miles (2,330 km) would even allow it to fly to battlefields overseas on its own.

The Army planned to purchase almost 1,300 Comanches to fill the scout and light attack roles, with the first craft to be brought into the Army in 2004. The Army conducted flight qualification tests and evaluated the eight prototypes that it planned to build. The first of those prototypes was rolled out of the Sikorsky Aircraft Corporation's helicopter production facility in May 1995 and was scheduled for its first flight in December 1995.

However, on February 23, 2004, the U.S. Army announced their decision to cancel the Comanche helicopter program in view of the growing popularity in the military of using unmanned aerial vehicles (UAVs) for reconnaissance purposes – in addition to tests, UAVs had proved their worth in the American War on Terrorism against Afghanistan and Iraq. About US$8 billion had already been invested in the Comanche program at the time of its termination and an additional US$450-680 million was required in contract termination fees to main program partners Sikorsky and Boeing Integrated Defense Systems.

Technology developed for the Comanche will be integrated into the Apache and other U.S. military helicopter developments.

RAH-66 COMANCHE RECONNAISSANCE / ATTACK HELICOPTER, USA

The Comanche RAH-66 reconnaissance and attack helicopter was being developed by Boeing and Sikorsky for the US Army. The first flight of the Comanche took place on 4 January 1996. The program entered Engineering and Manufacturing Development (EMD) in June 2000, which required the construction of nine aircraft in addition to the two prototypes by 2006. Critical design review of the overall weapon system was completed in June 2003 and was to be followed by low rate initial production of 78 helicopters in three batches in 2007.

In February 2004, the US Army announced that it plans to cancel further research, development and planned purchases of the RAH-66 Comanche stealth helicopter. It considers that the helicopter will

not meet the requirements of changing operational environments. An amendment to Congress will be submitted for the 2005 budget request that would allow the Army to terminate the Comanche program and reallocate funds to restructure Army aviation programs. The Army plans to buy approximately 800 more aircraft and upgrade another 400 with the diverted Comanche funds.

The armed reconnaissance Block I version was scheduled for initial operating capability in 2009 and heavy attack Block II version in 2011. The US Army requirement was for 650 Comanche helicopters.

Production of the Comanche would have taken place at Sikorsky's new site in Bridgeport, Connecticut. Boeing was responsible for manufacturing and assembling the composite tail section and rotor blades and Sikorsky for manufacture of the main fuselage and gearbox and for integration and final assembly of the airframe.

In an armed reconnaissance mission, Comanche can recognise and identify targets and digitally transmit the information to the battlefield commander in near real-time, select the optimum force deployment and co-ordinate the attack.

DESIGN

The airframe is crashworthy and ballistically tolerant to 23mm gunfire. The radar cross section has been minimised, primarily by the precisely shaped fuselage and internal weapons configuration. The helicopter has a composite five-bladed bearingless main rotor and an enclosed composite fantail tailrotor for increased anti-torque capability. The rear rotor is able to withstand impact by 12.7mm rounds and provides a 180° turn in 4.7 seconds in hover mode and an 80 knot snap-turn-to-target in 4.5 seconds.

COCKPIT

The Comanche has two identical cockpits for the pilot and the co-pilot, which are sealed and have a positive pressure air system for protection against chemical and biological warfare. The fly-by-wire flight control system is triple redundant. The cockpit is fitted with a pilot's night vision system from Lockheed Martin and the pilots have a wide field of view (35° x 52°) Kaiser Electronics Helmet Integrated Display Sighting System (HIDSS). HIDSS employs active matrix liquid crystal display (AMLCD) technology. The targets are designated and the weapons fired from collective and sidestick control push buttons. Each integrated cockpit has Harris Corp. flat screen liquid crystal displays, a colour display for a digital moving map system, tactical situation and night operation display.

Northrop Grumman is providing the Comanche's integrated Communications, Navigation and Identification (CNI) suite. The CNI suite will feature secure multi-wave, multiband multimode wireless communications, Link 16, satellite communications and Enhanced Position Locating Reporting System (EPLRS) via the tactical internet.

WEAPONS

The Comanche carries its weapons internally and has a weapons bay on each side of the fuselage. The missiles are mounted on the weapon bay doors which open sideways. The internal weapon bay can be fitted with Stinger, Starstreak or Mistral air-to-air missiles; TOW II, Hot II or Longbow Hellfire air-to-ground missiles; Sura D 81mm, Snora 81mm, Hydra 70 rockets; or the Army Counter Air Weapon System. The number of missiles on each door mounting varies, for example each door will

hold three Hellfire or six Stinger missiles. The helicopter can be reconfigured with optional stub wings fitted with multiple weapon pylons which carry an additional four Hellfire or eight Stinger missiles.

The Comanche is equipped with a turreted gun system from General Dynamics Armament Systems. The stowable externally-powered three-barrel 20mm Gatling gun is capable of firing 750 or 1,500 rounds per minute. The gun is mounted on a Giat composite turret (weighing 127kg) under the nose of the helicopter. The 500 round ammunition supply system can be reloaded in less than 8 minutes by two crew members.

COUNTERMEASURES

The helicopter countermeasures suite includes an AN/AVR-2A(V) Advanced Laser Warning Receiver from Goodrich Electro-Optical Systems (formerly Raytheon) of Danbury, Connecticut and the ITT AN/ALQ-211 SIRCM (Suite of Integrated Radio Frequency Countermeasures) suite, as well as infrared jammers.

FIRE CONTROL AND OBSERVATION

The Comanche is equipped with a suite of passive sensors and a computer-aided Northrop Grumman mission planning system, which carries out sensor data fusion, high-speed analysis and correlation of the sensor data. Northrop Grumman TASS (Target Acquisition System Software) functions include automatic target tracking and target threat management. The analysed data is presented to the crew in the cockpit displays or transmitted to other elements of the force, providing direct relay of near real time intelligence.

Lockheed Martin Missiles and Fire Control has developed the EOSS (Electro-Optics Sensor System) which comprises: EOTADS target acquisition and designation system, including solid-state TV sensor, two-colour laser rangefinder/designator and second-generation focal plane array long-wave FLIR (forward-looking infrared); and NVPS Night Vision Pilotage System with a second FLIR. The first complete EOSS system was delivered in June 2003.

The Comanche will be fitted with a fire control radar (based on the Longbow millimetre wave radar on the AH-64D Apache helicopter) being developed by Northrop Grumman Land Combat Systems and Lockheed Martin Missiles & Fire Control.

NAVIGATION AND COMMUNICATIONS

The helicopter has a global positioning system, a radar altimeter and an attitude heading reference system (AHRS) from Northrop Grumman (formerly Litton).

It is equipped with an identification friend or foe (IFF) interrogator and a dual jam resistant VHF-FM / UHF-AM Have Quick tactical communications system.

ENGINES

The Comanche is equipped with two T-800-LHT-801 turboshaft engines from LHTec with a maximum rated power of 1,563 shaft horsepower each. The internal fuel capacity of the helicopter is 1,142 litres.

The Comanche RAH-66 reconnaissance and attack helicopter.

The Boeing-Sikorsky RAH-66 Comanche

Comanche on exercise.

The Comanche is equipped with a stowable three-barrel 20mm gatling gun from General Electric.

The missiles are mounted on the weapon bay doors which open sideways.

The RAH-66 Comanche is almost 4 times less easy to observe and 6 times quieter than the Longbow Apache

Comanche in desert livery.

All Comanche maintenance areas are easily accessible without the use of ladders or stands.