Order Code RS20522
Updated January 9, 2002

Army Aviation: The RAH-66 Comanche Helicopter Issue

Christopher Bolkcom
Analyst in National Defense
Foreign Affairs, Defense, and Trade Division

Summary

Although it has been a high Army priority, a number of factors have complicated the RAH-66 Comanche program. Since its inception, the program has been restructured several times–postponing the initial operational capability (IOC) and increasing overall program costs. In early 2002, DoD is reviewing another Army plan to restructure the RAH-66 program. This report will be updated as developments warrant.

Background[1]

The RAH-66 Comanche is a next generation armed reconnaissance helicopter. It is the first helicopter designed and developed specifically for this mission. The Comanche is being designed to stealthily penetrate enemy airspace and conduct reconnaissance throughout the extended battlespace. It is to incorporate advanced computers and communications to play a leading role in the digital battlespace, and enough weaponry to engage a wide range of targets.

As part of heavy division/corps attack helicopter battalions, the Comanche's primary roles would be to seek out enemy forces and designate targets for the AH-64 Apache attack helicopter at night, in adverse weather, and in battlefields obscured by smoke and dust. In air cavalry troops and light division attack helicopter battalions, the RAH-66 would replace the Army's current fleet of AH-1 Cobra light attack helicopters and OH-58 Kiowa Warrior helicopters performing the attack mission as well as reconnaissance.

Originally, the Army envisioned developing and procuring 5,023 Comanches to replace the Army's 1960s-era observation, utility transport, and attack helicopters (OH-6, OH-58, UH-1, AH-1). Budget constraints and force structure modifications caused significant modifications to the Comanche program. First, the utility transport version of the platform was canceled and the procurement objective reduced to 1,292 armed

[1] This report supercedes CRS Report 96-525F, *Army Aviation: RAH-66 Comanche*, by Steven R. Bowman. Washington, 1996 (Archived).

reconnaissance helicopters. Second, the FY1993 budget deferred a production decision until 2006 and trimmed the number of prototypes from six to three. Third, in December 1994 DoD trimmed $2 billion from the RAH-66 program and dropped another prototype, going from three to two. Finally, in 1995, the Army restructured the program to add 6 "experimental operational capability" helicopters within the reduced budget limits, in part by producing them without the armaments suite.

In April 2000 the Comanche program successfully completed a series of tests and was cleared to begin its two year, $3.1 billion Engineering and Manufacturing Development phase[2]. Five pre-production aircraft will be built for this phase and eight production aircraft are due for delivery by 2004 for initial operational testing and evaluation. A total of 14 initial operational capability RAH-66s was planned for delivery at the end of 2006.[3] Current plans call for Boeing Sikorsky to produce a total of 1,213 Comanches through 2024.

The Debate over Mission and Capabilities

The RAH-66 Comanche is designed to replace the aging AH-1 and OH-58D helicopters and to augment the AH-64 Apache attack helicopter. Critics of the Comanche program argue that there is no need for a highly sophisticated, very low observable armed reconnaissance helicopter in today's threat environment. They contend that Comanche's capabilities and mission requirements were developed in response to a Cold War threat environment that no longer exists. Furthermore, the Apache and Kiowa helicopters performed very well as a hunter-killer team during Operation Desert Storm (1991). Critics also argue that the Comanche's role and capabilities are too similar to the Apache's to justify the costs of the helicopter's development and production. They would cancel the RAH-66, and use the savings to upgrade the OH-58 aircraft and the AH-64D Apache's Longbow[4] target acquisition capabilities.

Proponents of the RAH-66 agree that the Cold War threat has disappeared, but counter that today's low-intensity regional conflicts (such as Kosovo and Somalia) place even greater burdens on Army aviation. U.S. Forces must be more deployable, less reliant on forward bases, and more versatile than they were during the Cold War. Supporters argue that Comanche satisfies all three criteria. Furthermore, proponents argue that Comanche is an unparalleled force multiplier. It makes the whole force more effective and will reduce the Army's maintenance burden. This perspective, proponents argue, is supported by initial results from a recent Army "Analysis of Alternatives." This study compared attack and air cavalry squadrons equipped with AH-64D Longbows and OH-58D Kiowa Warriors to units composed of Apaches and Comanches.

---

[2] Comanche Cleared to Begin Engineering and Manufacturing Development. Defense Daily. April 6, 2000: 5.

[3] Telephone conversation with Jack Satterfield, Boeing spokesman; Capaccio, Tony, U.S. Army To Make Decision on Helicopter Purchases in April, *Bloomberg News Service*, March 2, 2000.

[4] The AH-64D Longbow is an upgraded version of the AH-64A which includes a millimeter-wave Fire Control Radar target acquisition system and fire-and-forget Hellfire missiles.

The force equipped with Comanches reportedly demonstrated better situational awareness, survivability and lethality than the other force. The study suggested that the most significant gains were achieved when the Comanche replaced the OH-58D. The Comanche provided better sensing, lethality, range, agility, survivability, and versatility than the Kiowa units. Comanche also improved the effectiveness of the Longbow when the two aircraft were mixed in attack units. The RAH-66's stealth improved Apache Longbow's survivability when cooperative tactics, techniques and procedures were used.[5]

Claims of reduced maintenance burdens for the Comanche, however, are more controversial than are claims of its effectiveness[6]. Projected ratios of maintenance man-hours to flight hours have varied over time. The Army hopes to achieve a ratio of 2.6 hours of maintenance to every one hour of flight; however, both the General Accounting Office and Congressional Budget Office assert that projected reductions in maintenance are always optimistic.[7] Additionally, some studies conclude that the Comanche is more expensive to fly than the Kiowa Warrior ($2,042/hour vs $1,598/hour), but less expensive than the AH-64D, which can cost as much as $3,622/hour to fly.[8]

As part of its transformation efforts, the Army is studying the size and shape of its aviation force structure. The intent of this Training and Doctrine Command study is to make the Army's aviation forces easier to deploy and more flexible, so they can better support the small-scale contingency operations and military operations other than war which the Army anticipates will be its most frequent missions. The study is a work in progress, but a leading concept, referred to as the "Way Ahead," is noteworthy for its potential consequences for the Comanche program.

The primary recommendation of the "Way Ahead" is to meld today's 24-aircraft lift helicopter and scout/attack helicopter battalions into 30-aircraft battalions composed of both lift and scout/attack helicopters (10 Apache Longbows, 10 Comanches and 10 UH-60 Blackhawks). The Army would need only 40 of these composite battalions, versus today's 51. The Way Ahead would also phase out legacy helicopters more quickly than previously planned. Under this approach, the Army would field only 625 Comanches by the year 2018 – approximately a 50% reduction in the currently planned buy of RAH-66s.[9] The 2000

---

[5] Winograd, Erin Q. Initial Results of Alternatives Analysis Show RAH-66 Contributions. *Inside the Army*. January 24, 2000.

[6] Claims of improved maintenance requirements are based on projections of advanced processes and technologies which won't be proven until the aircraft is fielded. In general, more technologically sophisticated weapon systems are more difficult to maintain than less sophisticated weapon systems.

[7] CRS Report 96-525, *Army Aviation: RAH-66 Comanche*, by Steven R. Bowman. Washington, 1996: 3-4.

[8] Winograd, Erin Q. Initial Results of Alternatives Analysis Show RAH-66 Contributions. *Inside the Army*. January 24, 2000.

[9] Winograd, Erin Q. TRADOC Proposes Overhaul of Army's Aviation Force Structure. *Inside the Army*. December 6, 1999.

Army Aviation Master Plan recommends a reorganization of the Army's force structure, but did not specify how many Comanches it would eventually purchase.[10]

Congressional Action

Congress strongly supported the Comanche program by consistently meeting or exceeding DoD's budget requests for funding. In its report on DoD's FY1996 budget request, the House Armed Services Committee reproached both the Army and the DoD for tepid commitment to the program, urging that it be given a higher funding priority and that full-scale production by 2004 be guaranteed.[11]

Table 1. Summary of Recent Comanche R&D Funding
(in Millions $)

	FY02	FY01	FY00	FY99	FY98
DoD Request	787.8	614.0	427.1	367.8	282.0
Appropriations Conference	787.8	614.0	467.1	367.8	282.0

Recent Developments

In November 2001, Army officials said they were planning on a heavy variant of the RAH-66 as a replacement for the AH-64D. As part of Army transformation plan, Maj. Gen. John Curran, commander of the Army's aviation center, said that the Comanche could perform the attack as well as the armed reconnaissance mission in the future.[12] It is unclear whether the RAH-66 could maintain its stealthy profile while carrying external weapons, however, and some questions whether Comanche – which currently suffers from weight problems – has the power and fuel capacity to take on even more weight.[13]

Following a GAO report critical of the Comanche Program[14], the Army proposed in late 2001 to restructure the RAH-66 program. The purpose of the restructuring is reportedly to reduce risk by eliminating some of the "concurrency" that currently exists in the program, as well as to address creeping cost growth and schedule slippage. The Army plan is to reduce the number of helicopters built during the program's EMD phase. The money that is freed up by this strategy would then be used to conduct additional R&D

---

[10] Winograd. Erin Q. New Aviation Plan Calls for Just Four Types of Aircraft, More AH-64Ds. *Inside the Army*. April 3, 2000

[11] U.S. Congress. House of Representatives. Committee on National Security, National Defense Authorization Act for Fiscal Year 1996, 104th Cong., 1st Sess., H.Rept. 104-131, June 1, 1995: 91-92.

[12] Baumgardner, Neil. Heavy Comanche to Replace Apache, Army Officials Say. *Defense Daily*. November 13, 2001.

[13] Capaccio, Tony. Boeing, United Tech Comanche Copter's Cost, Weight Hit by GAO. *Bloomberg.com*. May 18, 2001.

[14] *Defense Acquisition: Comanche Program Objectives Need to be Reviewed to Meet Achievable Objectives*. General Accounting Office (GAO-01-450), June 7, 2001.

efforts, especially in software development. The Army claims that by reducing risk now, and increasing production later, the Service could save more than $3 billion.[15]

Observers comment that decreasing the number of RAH-66 EMD aircraft could increase the development price $1.5 to $2 billion and add two years to the schedule, fielding an operational version of the Comanche in 2008 (and potentially 2010) rather than the previously scheduled IOC of 2006.[16] In late December 2001 it was reported that top DoD acquisition officials, who must approve the Army's restructuring plan, were still conducting their review.[17]

Potential Issues for Congress

In light of the facts and arguments presented above, an overarching question for Congress is: "Is reducing the Comanche program an appropriate method of freeing up funds to finance the Army's plan to build lightweight armored vehicles and form new units of more mobile troops?" Many analysts suggest that maintaining the funding required to purchase 1,213 RAH-66s over the program's 20 year production cycle (beginning in 2006) will be difficult. Thus, while the Army remains committed to the full purchase of Comanche today, it will continue to face pressure to reduce the program in coming years.

Congress may wish to pursue the following lines of inquiry:

- Comanche is the Army's only major aviation development program. The Comanche Operational Requirements Document describes the RAH-66's contribution to future Army warfighting missions. It states that "Aviation capabilities add increased deployability, versatility, lethality, flexibility, mobility, extended coverage and sustainment to Maneuver, Fire Support, Air Defense..."and other mission areas. Also, "Current systems are tactically and technically incapable of performing armed reconnaissance, attack and air combat..."in the modern threat environment. If the Comanche buy is reduced, what effect will this have on long-term capabilities? How much does Comanche contribute to combat power vis-a-vis the light armored vehicles that the also Army wants?
- $4.5 billion has been spent on the Comanche as of FY1999.[18] Will a purchase of 600 helicopters (for a yet to be estimated sum, but possibly near $30 billion) be a sufficient return on this R&D investment?
- In recent conflicts, fixed wing combat aircraft have played a prominent role, while Army attack helicopters have not. Might improved versions of AC-130 gunships, and A-10 Warthog, or the vertical/short take off and landing variant of the Joint Strike Fighter, be more effective providers of Close Air Support to Army ground forces than the RAH-66?

---

[15] Wall, Robert. Army Defends Comanche Changes. *Aviation Week & Space Technology*. December 17, 2001

[16] Wall, Robert. New Comanche Restructuring Adds Cost, Delays Fielding. *Aviation Week & Space Technology*. December 3, 2001

[17] Canahuate, Tom. Pentagon Reviews Comanche Program While Congress Adds Money. *Defense News.* December 20, 2001.

[18] Selected Acquisition Report (SAR) Summary Tables. (As of September 30, 1999)Department of Defense, OUSD(A&T), Systems Acquisition, November 10, 1999:11.

- The need for Comanche has been challenged on the basis that its capabilities do not differentiate it sufficiently from Apache to merit its development. However, turning this argument around, some would assert that the Comanche is well-suited to be the Apache's replacement as the Army's premier attack helicopter and the Army's best platform for future growth and development in this area. Subsequently, one could anticipate a helicopter force structure composed solely of heavy lift (CH-47), battlefield utility (UH-60), and scout/attack (RAH-66) aircraft.
- Consideration of export issues is part and parcel of any military program. How much might Comanche exports contribute to sustaining the aviation industrial base and balancing U.S. trade? As a new platform, and one less overtly designed for attack than the Apache, might the Comanche be offered for export to a larger number of countries than the AH-64? Conversely, due to its low observable features might Comanche exports need to be limited to our closest allies?

Table 2. Comparative Helicopter Characteristics

	RAH-66 Comanche	**AH-64D Longbow Apache Upgrade**	**AH-1F Cobra**	**OH-58D Kiowa Warrior Upgrade**
Unit Program Cost (FY01 $m)	$37.75 (Then year $, 1,213 unit buy)	$10.23	$11.5	$8.5
IOC	2008	1984 (A Model)	1967 (G Model)	1969 (OH-58)
Max Range	1200 nmi	1024 nmi	441 nmi	250 nmi
Max Speed	175 kts	141 kts	137 kts	112 kts
Armament	20mm gun; 4 Hellfire and 2 Stinger Missiles (more w/pylons, but w/less stealth)	16 Hellfire missiles or 76 Hydra rockets, 30mm cannon	1 M197 three barrel 20 mm gun 4 TOW missiles, 8 Hellfire, or 1 AIM-9L missile	4 Hellfire or Stinger missiles, or 14 Hydra rockets, or 1 7.62 mm/1.50cal gun
Stealth	Advanced	No	No	No
Night Flight	Yes	Yes	Yes	Limited
All Weather	Yes	Yes	Limited	Limited
Communication	Non-line-of-sight, digitized, joint	Line-of-sight, non-digital voice	Line-of sight, non-digital voice	Line-of-sight, non-digital voice
Sensors	EO, laser designator, 2nd gen. FLIR/MMW/TV target detect/acq.	TV IR radar, laser designator, 2nd gen. FLIR/MMW/TV target detect/acq.	TV, FLIR, laser designator	TV, IR radar, laser designator