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Army Aviation: The RAH-66 Comanche Helicopter Issue

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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 late 2002, DoD restructured the RAH-66 program again, cutting the number of aircraft to be procured in half. This report will be updated

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. It is to incorporate advanced computers and communications to play a leading role in the digital, network centric battlespace, with enough weaponry to engage a wide range of targets. Some call the Comanche the world's most sophisticated combat helicopter, with more lines of software code than even the F/A-22 Raptor.[2] 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..

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 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

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

[2] Vernon Loeb. "Fate of Army Chopper On The Block." *Washington Post*. August 31, 2002. p.2.

1994 DoD trimmed $2 billion from the RAH-66 program and dropped another prototype, going from three to two. Fourth, 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[3]. Boeing-Sikorsy has built and flown two Comanche prototypes. The first pre-production model, and the third Comanche is being built and is expected to be flown first in March 2005.[4] The last plan was for five pre-production aircraft to be built in this phase and eight production aircraft were 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[5] and 1,213 Comanches were to have been produced through 2024. On October 21, 2002 it was announced that former DoD acquisition chief Pete Aldridge had signed an acquisition decision memorandum (ADM) giving final approval for the latest restructuring of the RAH-66 program. Under this new plan, the total purchase of Comanches would be reduced from 1,213 to 650 aircraft. Seventy three aircraft will be produced during Low Rate Initial Production (LRIP) in different blocks. Nine EMD aircraft, which will most likely be used as trainers, will be built and delivered by 2006. The Comanche's Initial Operating Capability (IOC) will be achieved in September 2009, three years later than originally planned, and nine months after the most recent plan. The remaining 577 aircraft will be produced under a full rate production schedule of 60 aircraft per year, starting in 2011. The Army had wanted to boost the production rate to 96 aircraft per year as part of an effort to cut costs.[6]

This restructuring reduces the Comanche's production phase from $39.3 billion to an estimated $26.9 billion. DoD has agreed to add $3.7 billion to the helicopter's $3.2 billion full-scale development program. Army officials estimate that the cost of each Comanche, adjusted for inflation, will increase by 33 percent – to $32.3 million[7]

Much of the program's problems have been due to the amount of systems that have been developed concurrently. For example, the radar, armor, and navigation and communication systems were all being developed at the same time.[8] The latest restructuring will reduce this concurrence by delaying the fielding of certain capabilities

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[3] "Comanche Cleared to Begin Engineering and Manufacturing Development." *Defense Daily*. April 6, 2000.

[4] Kent Faulk. "Comanche Helicopter On Last Chance To Fly." *Birmingham News*. July 1, 2002.

[5] 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.

[6] Neil Baumgardner. "Aldridge Inks Comanche Acquisition Decision Memorandum, Numbers Cut To 650." *Defense Daily*. October 21, 2002.

[7] Tony Capaccio. "Boeing, UTX See Positive Impact in Comanche Cut." *Bloomberg.com*. October 23, 2002.

[8] Neil Baumgardner. "Army Ready to Move Forward with Comanche, Program Manager Says." *Defense Daily*. February 28, 2002.

– the radar system, a high level of control of UAVs, full air-to-air engagement with the turreted gun system, Link 16 datalink, and satellite communications – to later blocks. [9]

The program was also restructured to field a companion UAV for the Comanche, which will be developed with funds intended to upgrade Comanche itself. More sophisticated sensors and a better power drive system will be sacrificed in lieu of the UAV development. Comanche officials estimate that about $644 million between fiscal years 2004 and 2009 will be spent on the Comanche's UAV instead of the platform itself.[10] The Army has experimented with teaming UAVs and both Apache and Comanche for several years, including work with the RQ-5A *Hunter*.[11] It is currently unclear whether the Comanche's companion will be an operational UAV, one currently in development, or one developed specifically for the job.

If there are no further changes, Comanche prime contractors Boeing and Sikorsky would build helicopters through 2019."[12] However, the final word on Comanche numbers has not been spoken. Some note that while DoD originally planned to procure approximately 1,100 H-60 helicopters, over 2,500 have been procured to date.[13] Army officials claim that 650 aircraft are too few, and that they require 819 Comanches to effectively equip their Objective Force which is hoped to be ready by 2008. Plans call for fielding detachments of 12 Comanche aircraft to the Objective Force brigade-strength 'units of action,' accompanied by eight UAVs."[14]

In May 2002, DoD's Inspector General (IG) reviewed the restructured Comanche program. The IG report called the restructuring a constructive approach to reducing risk and improving the program. However, the IG cautioned that continued emphasis is required to ensure that integration problems do not emerge in the future that could result in increased cost and schedule.[15]

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

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[9] Baumgardner. *OpCit.* "Aldridge Inks Comanche Acquisition Decision Memorandum."

[10] Erin Winograd. "Army Leaders Adamant That 650 Comanches Won't Meet Requirements." *Inside the Army.* October 28, 2002. p.10.

[11] Kim Burger. "AUSA - Army Eyes Apache to Fill Comanche Gap." *Jane's Defense Weekly.* October 30, 2002.

[12] Robert Wall. "New Comanche Plan Gets Green Light." *Aviation Week & Space Technology.* October 28, 2002.

[13] Ron Laurenzo. "Comanche's Looking Up, But Now Comes The Crunch." *Defense Week.* June 2, 2003.

[14] Burger. *OpCit* "AUSA - Army Eyes Apache to Fill Comanche Gap."

[15] James Asker. "Pentagon Inspector: Latest Comanche Development Plan Reduces Program Risk." *Aviation Week & Space Technology.* May 19, 2003.

capabilities and mission requirements were developed in response to a Cold War threat environment that no longer exists. 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[16] target acquisition capabilities. Others say that Comanche's reduced radar signature will do little to make it more survivable than current helicopters. They note that in Iraq, Army and Marine Corps helicopters were shot down or damaged by IR-guided missiles, rocket-propelled grenades, and small arms fire, none of which use radars for targeting.

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 makes the whole force more effective and will reduce the Army's maintenance burden. This perspective, proponents argue, is supported by initial results from an 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. The force equipped with Comanches reportedly demonstrated better situational awareness, survivability and lethality than the other force. 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.[17]

Claims of reduced maintenance burdens for the Comanche, however, are more controversial than are claims of its effectiveness[18]. 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.[19] 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.[20]

The Comanche's role vis-a-vis the Apache is a continued point of debate. The most recent reduction in the Comanche program has increased the prominence of the AH-64

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[16] 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.

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

[18] 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.

[19] CRS Report 96-525, *Army Aviation: RAH-66 Comanche*. P. 3-4.

[20] Winograd *OpCit*. "Initial Results of Alternatives Analysis Show RAH-66 Contributions."

Apache. To compensate for fewer Comanches, the Army is considering improvements to Apache, such as a life-extension program or upgrades. Another option may be to procure more Longbow models.[21] Some suggest that the DAB decision reaffirms the Apache's place as the Army's attack aircraft, and question whether Comanche should pursue features such as the external fuel, Armaments and Munitions System, or an air-to-air missile capability.[22]

Another issue is whether the Army will upgrade Comanche for 'heavy' attack requirements. 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, Army officials said that the Comanche could perform the attack as well as the armed reconnaissance mission in the future.[23] 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.[24] The Marine Corps is expected to seek a replacement for its AH-1Z Super Cobra helicopters around 2020 and it has been suggested that a joint program with the Army is worth investigating.[25]

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.[26]

Summary of Recent Comanche R&D Funding in $ Millions

	FY04	FY03	FY02	FY01	FY00	FY99	FY98
DoD Request	1,079.3	914.9	787.8	614.0	427.1	367.8	282.0
Appropriations Conference	-	914.9	787.8	614.0	467.1	367.8	282.0

In their reports (H.Rept. 108-106, H.R. 1588; and S.Rept. 108-46, S. 1050), House and Senate authorizers respectively matched the Administration's request for FY04 Comanche funding.

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[21] Burger. *OpCit*. "AUSA - Army Eyes Apache to Fill Comanche Gap."

[22] Winograd. *OpCit*. "Army Leaders Adamant That 650 Comanches Won't Meet Requirements."

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

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

[25] Kim Burger. "US Army Cuts Comanche Buy." *Jane's Defense Weekly*. October 16, 2002. p.3.

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

Potential Issues for Congress

In light of the facts and arguments presented above, 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. 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?

- $6.8 billion has been spent on the Comanche through FY03.[27] Will a purchase of 650 helicopters be a sufficient return on this R&D investment?

- Some say that in recent conflicts, fixed wing aircraft have played a more prominent role, than Army attack helicopters. Might improved versions of the AC-130 and A-10, or the STOVL variant of the Joint Strike Fighter, be more effective providers of Close Air Support to Army ground forces than the RAH-66?

- 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. What are the merits of this force structure?

- 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?

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[27] Selected Acquisition Report (SAR) Summary Tables. (As of June 30, 2002)Department of Defense, OUSD(A&T), Systems Acquisition. [http://www.acq.osd.mil/ara/am/sar/index.html].