



## Comanche—Critical Enabler for Joint and Army Future Force Operations

Military forces have always needed reconnaissance forces to develop the situation and to provide early warning and critical information to the commander. Today we refer to reconnaissance as a contributor to the *Common Relevant Operational Picture*. The U.S. Army plans to use the RAH-66 Comanche stealth helicopter to support reconnaissance, close combat, mobile strike and vertical maneuver operations. Comanche will be a major contributor to situational awareness, joint precision fires and joint air-ground operations. With its full-spectrum capabilities, Comanche will be capable of working in noncontiguous areas of operations against asymmetrical threats. Comanche is programmed to operate as an integral part of the Joint Future Force.

Emerging lessons learned from Operation Iraqi Freedom validate helicopter reconnaissance requirements. Commanders employed the OH-58D Kiowa Warrior armed reconnaissance helicopter in reconnaissance and shaping operations. After-action reports indicate tremendous success with air cavalry, ground cavalry and close air support working as a team within the overall combined-arms team. The OH-58D proved to be a reliable and survivable aircraft; more than 2,000 combat hours were flown, with none lost to hostile fire. While effective, the OH-58D had limitations—the aircraft was restricted to 5,200 pound gross weight; range and endurance limitations caused more refueling stops; the infrared (IR) jammer did not function properly; .50-caliber machine guns proved unreliable; and extended-range communications were

ineffective. Comanche will be much more effective and survivable; have greater range, speed and endurance, fuse information from joint sensors; and provide “actionable” combat information to the air-ground team.

The Department of Defense (DoD) Transformation Guidance (April 2003) states that new systems must contribute to “shaping the changing nature of military competition . . . through new combinations of concepts, capabilities, organization.” *Comanche is a transformational system*. Examples of how Comanche supports DoD guidance include:

- **DoD Guidance:** “U.S. forces will leverage asymmetric advantages . . . drawing upon unparalleled Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities that provide joint . . . situational awareness . . . and rapid, robust sensor-to-shooter targeting.”

**Comanche contributions include** an integrated joint and combined arms air-ground system-of-system that uses Joint Tactical Radio System (JTRS) waveforms, wideband network waveforms (WNW), and the Link 16 tactical data link to exchange information within joint intelligence, surveillance and reconnaissance (ISR) systems-of-systems. Comanche, teamed with unmanned aerial vehicles (UAVs), will provide unparalleled C4ISR capabilities in support of the joint air-ground team.

- **DoD Guidance:** “Combined arms forces armed with superior situational awareness will maneuver



more easily around the battlefield and force the enemy to mass where precision engagement may be used to maximum effect.”

**Comanche contributions include** receiving information from joint sensors, then fusing that information so “pilots in the loop” can make real-time decisions. The Comanche crew can provide actionable combat information to the air-ground team, support shaping operations and work with tactical fighters or other indirect-fire systems as appropriate targets emerge. Comanche can also apply organic precision fires to engage time-sensitive targets.

- **DoD Guidance:** “Dispersed forces [will] . . . increase close coupling of intelligence, operations and logistics to achieve precise effects.”

**Comanche contributions include** an aided target detection/classification system, on-board databases for storing intelligence information, sensor fusion, and data links for networked joint ISR and fires and teaming with UAVs. Comanche also has designed-in diagnostics and prognostics to increase availability and reduce logistics demands.

- **DoD Guidance:** “Deep Sensor Reach [will] move to deployable, distributed and networked sensors . . . and can detect actionable information.”

**Comanche contributions include** capabilities to conduct long-range reconnaissance, and provide a “man-in-the-loop” interface with UAVs, special operations forces and other service reconnaissance systems. Actionable information can be rapidly passed to appropriate members of the joint air-ground team.

## **Comanche Roles and Missions in the Unit of Action**

The “centerpiece” of the Army Future Force is the Unit of Action (UA). The UA will include ground and air assets capable of operating independently or as a part of a joint force. Each UA will contain 12 Comanche aircraft and eight UAVs. Comanche, working with UAVs, will support situational awareness, shaping operations and precision strikes over a large battlespace.

## **Comanche Operational Perspective**

Comanche applies advanced technology to bring a multirole capability to the joint air-ground team.

Comanche’s range, speed, endurance and weapon systems will also be a valuable asset to special operations forces. Stability Operations and Support Operations (SASO) also will benefit from Comanche’s range, endurance and intelligence-gathering capabilities. Comanche will provide a commander engaged in SASO with capabilities to monitor large areas, both day and night, and provide near real-time information on crowd activities, suspected terrorists activities around critical sites, etc. Comanche provides several capabilities that do not exist in today’s helicopter force. For example:

- Comanche can self-deploy intratheater, providing a combatant commander a responsive system to employ as a part of the joint force. For longer moves, four Comanches fit on a C-17, with the first Comanche operational within five hours after the C-17 lands.
- The on-board computer-driven battle management system, with state-of-the-art processing, will permit the import, processing and analysis of off-board sensor data. This data provides near real-time situational understanding to the Comanche crew and to other forces operating in concert with Comanche. Targets generated by Comanche sensors/databases can be rapidly passed to indirect-fire systems or to attack aircraft.
- Comanche communications capabilities will include WNW; an integrated software radio system, which is JTRS/Software Communications Architecture (SCA) compliant; satellite communications (SATCOM); Enhanced Position Location Reporting System (EPLRS); and Link 16. These capabilities bring new dimensions to the employment of Comanche in support of the Future Army. For example:
  - Comanche could act as a “commanded internet server” within the UA Internet by combining on-board data bases with WNW and Tactical Control Data Link (TCDL). This capability could provide the commander real-time video and improve the quality of data received from widely dispersed units.
  - Comanche will operate in the Future Combat System (FCS)/WNW network with the capability to receive and transmit real time situational awareness and targeting data.

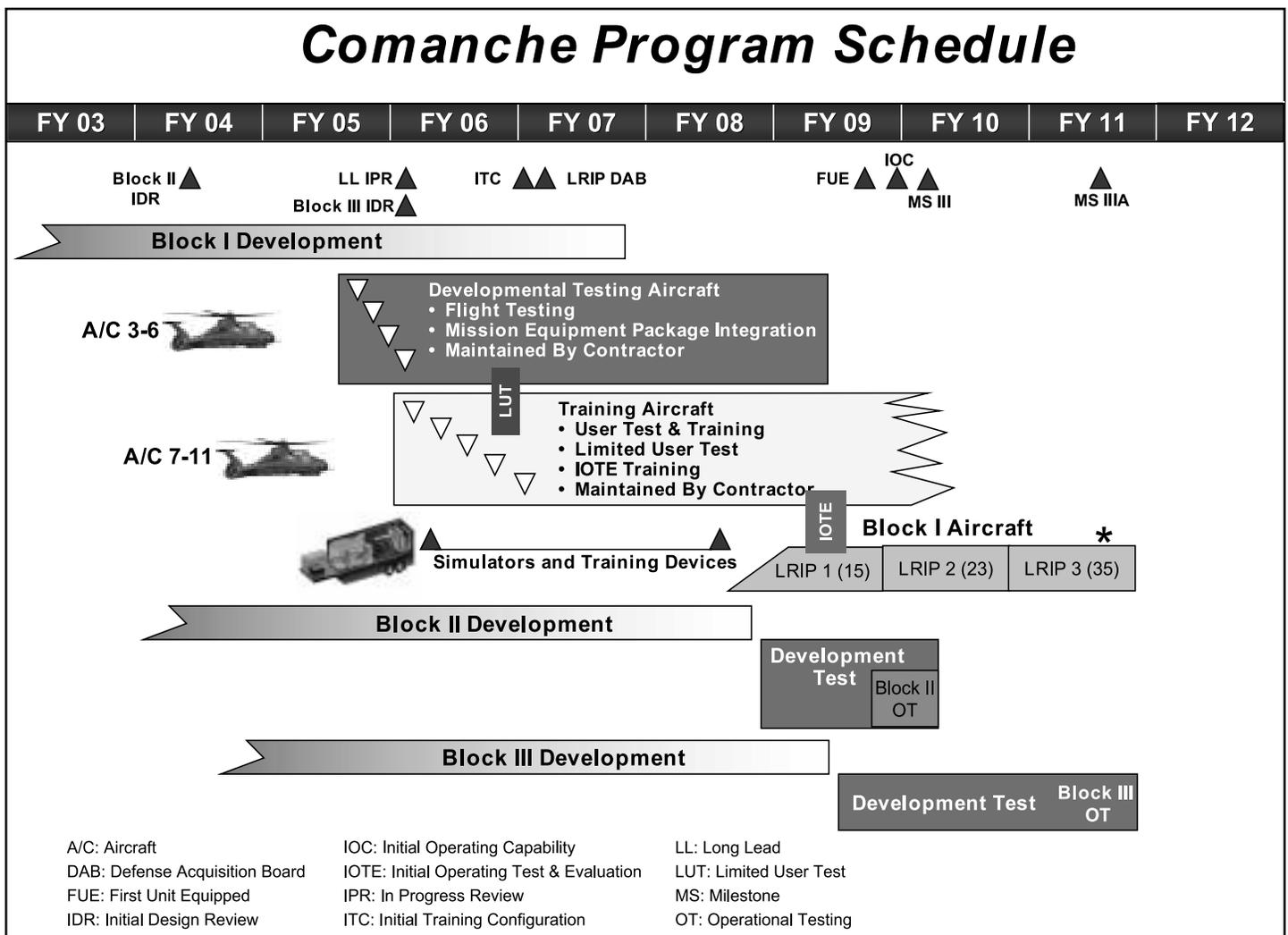
- Infrared and radar targeting sensors are fused to a common display that detects and classifies targets at far greater ranges than current helicopter systems.
- Threat detection is decreased through radar returns that are much smaller than current force combat rotorcraft. The cooled engine exhaust and treated aircraft “skin” also present smaller infrared images.
- Weapon systems, including Hellfire missiles, Advanced Precision Kill Weapons and a 20mm Gatling gun, give the crew capabilities to attack time-sensitive targets.
- The aircraft can operate out to 430 kilometers and has a dash speed of 170 knots and 2.5 hours of endurance with integral fuel tanks. Auxiliary fuel tanks can extend range and endurance.
- Comanche will work closely with the eight UAVs assigned to the UA. Comanche and its crew will have many options for working with UAVs. These options include taking direct control of UAVs to

extend reconnaissance coverage, receiving UAV sensor data and integrating into Comanche database “servers” for rebroadcast to the UA; or the crew could use UAV sensor data to direct precision fires on time-sensitive targets.

- Three soldiers can rearm and refuel the aircraft in about 20 minutes. There will also be a significant reduction in maintenance man-hour for flight hours.

### Comanche Program:

- Successfully completed Joint Requirements Oversight Council (JROC), Defense Acquisition Board (DAB), FCS Milestone B decision process.
- Initial production aircraft provide most capabilities; “block” upgrades planned to ensure full mission requirements:
  - Block I: Aircraft # 12–89. Production starts in Fiscal Year 2008 with combat-capable rotorcraft that will be upgraded with each successive production block.



- Block II: Aircraft #90–209 and upgrade #12–89. Adds autonomous non-line-of-sight capabilities integrated with the Link 16 network and direct Level 4 control of UAVs.
- Block III: Aircraft #210+ and upgrade #12–209. Incorporates the ability to receive and integrate broadcasts from national intelligence sources and then rebroadcast to joint forces; adds 200-gallon external fuel tanks for extended operations.
- Key Performance Parameters (KPP) are projected to be met, to include vertical rate of climb, radar cross-section, infrared engine signatures, communications interoperability, and night target-acquisition criteria.
- Operational training aircraft (#7–11) delivered to Fort Rucker, Alabama in Fall 2005.
- First Unit Equipped in FY 2009, with Initial Operational Capability in Fall 2010.

### Summary

Comanche is a transformation system that brings a third dimension to the Army Future Force and to the joint air-ground team. Comanche and its crew will be a C4ISR integrator with a man-in-the-loop capability to rapidly translate reconnaissance into actionable combat information.

Teamed with UAVs, it brings tremendous capabilities to develop a situation and contribute to situational awareness. The Comanche development program is aligned with other Future Combat Systems and will be operational in Units of Action in 2012.

Comanche is not *THE* solution—but it is a *KEY* enabler system in Joint Future Force operations.

### Key Points

- Comanche meets Department of Defense Transformation Guidance (e.g., leverages asymmetric advantages, provides forces with superior situational awareness, increases close coupling of intelligence and operations).
- Comanche and its two-person crew provide “man and system in the loop” for C4ISR integration of rapidly actionable combat capabilities.
- Comanche, operating with unmanned aerial vehicles, provides the Unit of Action an armed reconnaissance capability.
- Comanche Developmental Testing commences in Fiscal Year 2005; User Test and Training in FY 2006; and First Unit Equipped in FY 2009.