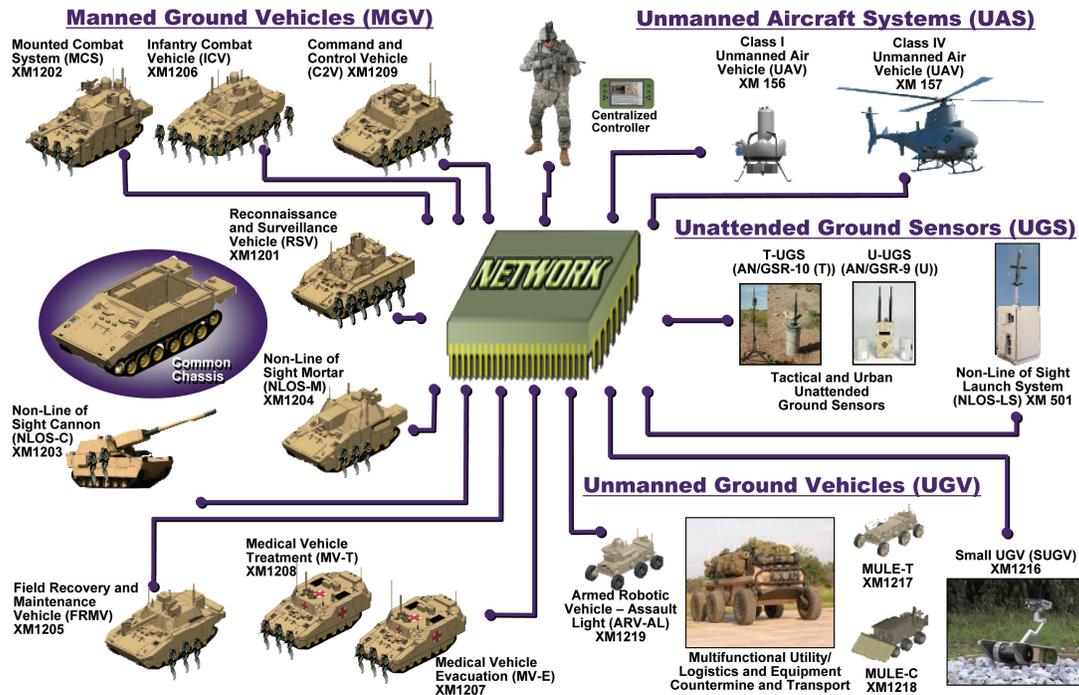


Future Combat Systems (FCS)



Executive Summary

- In 2008, the Army redefined its approach for the Spin Out of FCS systems to current force Brigade Combat Teams (BCTs). FCS Spin Out systems will now be fielded first to Infantry Brigade Combat Teams (IBCT) as opposed to the Heavy Brigade Combat Teams, as previously planned. As a result of this program refocus, the IBCT Spin Out Limited User Test (LUT) scheduled for the summer of 2008 was rescheduled for summer 2009.
- The FCS Spin Out program is reported on separately.
- Design efforts for all FCS systems are ongoing. All preliminary design reviews (PDR) for FCS systems are planned to be completed in early FY09 leading to an FCS system-of-systems PDR in the spring of 2009.
- During FY08, the FCS program executed a wide variety of developmental testing for each FCS system.
- The FCS program continued its efforts to develop armor upgrades for the Manned Ground Vehicles (MGV) aimed at achieving a satisfactory level of vehicle ballistic protection within vehicle weight constraints.

System

FCS is a networked system-of-systems consisting of 14 manned or unmanned systems linked together by an information network. The information network connects FCS via an advanced network architecture to provide joint connectivity and enhance situational

awareness, understanding, and synchronized operations. FCS is a system-of-systems which encompasses the FCS program systems and other Army and joint complementary systems in order to meet the missions of the FCS BCTs.

The FCS program consists of manned and unmanned platforms that include:

Manned Ground Vehicles

- Combat Vehicles:
 - Command and Control Vehicle (XM1209)
 - Infantry Combat Vehicle (XM1206)
 - Non-Line-of-Sight Cannon (XM1203)
 - Non-Line-of-Sight Mortar (XM1204)
 - Mounted Combat System (XM1202)
 - Reconnaissance and Surveillance Vehicle (XM1201)
- Maneuver sustainment vehicles:
 - Medical Vehicle (Evacuation and Treatment variants) (XM1207/XM1208)
 - Field Recovery and Maintenance Vehicle (XM1205)

The Non-Line-of-Sight Cannon (NLOS-C) is the lead vehicle in the development of Manned Ground Vehicles. A detailed report on this system is provided following this overview.

ARMY PROGRAMS

Unmanned Aerial Systems (UAS) (Four variants)

CLASS	FCS UNIT SIZE	TIME ON STATION	OPERATIONAL RADIUS
I	Platoon	50 minutes	8 km
*II	Company	2 hours	16 km
*III	Battalion	6 hours	40 km
IV	Brigade	24 hours	75 km

**The Army deferred development of the Class II and III UAS as part of the FCS program. Class II and III UAS remain an FCS objective requirement.*

The Army intends the FCS UAS to be multi-functional and mission tailorable. They are to operate in varying terrain, including urban environments, and be teamed with manned aircraft and ground maneuver forces. A detailed report on this system is provided following this overview.

Unmanned Ground Vehicles (Three types)

TYPE	FUNCTIONS
Small Unmanned Ground Vehicle (SUGV) (XM1216)	Reconnaissance of urban and subterranean battlespace
*Armed Robotic Vehicle (ARV) (two variants): <ul style="list-style-type: none"> • ARV-Reconnaissance, Surveillance, and Target Acquisition • ARV-Assault 	<ul style="list-style-type: none"> • Reconnaissance, surveillance, and target acquisition • Line-of-sight and beyond line-of-sight fires
Multi-functional Utility/Logistics Equipment (MULE) (three variants): <ul style="list-style-type: none"> • MULE – Transport (XM1217) • MULE - Countermine (XM1218) • MULE-ARV - Assault (Light) (XM1219) 	<ul style="list-style-type: none"> • Transport of equipment and supplies • Direct fire in support of dismounted infantry • Detection of mines and IEDs

**The Army deferred development of the larger ARV from the current FCS program. The ARVs require more technological maturity before entering into system development. ARVs remain an FCS objective requirement.*

The Army plans to equip the MULE variants with the Autonomous Navigation System to provide the capability to operate all UGVs either in a man-in-the loop mode or in a semi-autonomous mode.

Unattended Munitions

The Army intends the Non-Line-of-Sight Launch System (NLOS-LS) to provide networked, extended-range targeting,

and precision attack of stationary and moving targets. It consists of a Container Launch Unit (CLU), with self-contained tactical fire control electronics and software for remote and unmanned operations, and the Precision Attack Munition. The program intends NLOS-LS to be able to fire missiles with the CLU on the ground or mounted on a transport vehicle. A detailed report on NLOS-LS is provided following this overview.

Unattended Ground Sensors

FCS Unattended Ground Sensors (UGS) are an array of networked sensors capable of target detection, location, and classification. UGS consist of multiple types of sensors to include acoustic, seismic, magnetic, electro-optical/infrared sensors, and radiological/nuclear sensors. UGS are to be employed to provide enhanced threat warning and situational awareness. A detailed report on UGS is provided following this overview.

The FCS UGS program is developing two major sensors:

- Tactical-UGS (AN/GRS-10):
 - Intelligence, surveillance, and reconnaissance sensors
 - Radiological and nuclear sensors
- Urban-UGS (AN/GRS-9) is an array of small, lightweight imagery and intrusion detection sensors emplaced in urban structures.

Battle Command Network

The Battle Command Network is the information network that links together the FCS system-of-systems. The Battle Command Network consists of hardware and software to deliver video, still images, voice, data, and network control services throughout the FCS BCT. The network is to provide an interconnected set of information capabilities for collecting, processing, displaying, disseminating, storing, and managing information on demand with secure and reliable access by Soldiers throughout the FCS BCT. The Army intends for the network to include communications payloads on all FCS ground and air platforms and network management software distributed on all platform computers and communications payloads.

Mission

The FCS BCT will perform all tactical operations – offensive, defensive, stability, and support – currently conducted by light infantry, Stryker, and heavy mechanized forces. The Army intends for the FCS BCT to provide a measurable improvement over current brigade combat teams in terms of deployability, maneuverability, survivability, lethality, battle command, sustainability, and joint interoperability.

Prime Contractors

- Lead Systems Integrators: Boeing/SAIC

ARMY PROGRAMS

Activity

- In 2008, the Army redefined its approach for the Spin Out of FCS systems to current force BCTs. FCS Spin Out systems will now be fielded first to IBCTs as opposed to the Heavy Brigade Combat Teams, as previously planned. As a result of this program refocus, the IBCT Spin Out LUT scheduled for the summer of 2008 was rescheduled for summer 2009.
- Design efforts for all FCS systems are ongoing. All PDR for FCS systems are planned to be completed in early FY09 leading to an FCS system-of-systems PDR in the spring of 2009.
- During FY08, the FCS program executed a wide variety of developmental testing for each FCS system.
- The FCS program continued its efforts to develop armor upgrades for the MGVs aimed at achieving a satisfactory level of vehicle ballistic protection within vehicle weight constraints.

Assessment

- The Army Evaluation Task Force at Fort Bliss, Texas, remains key to the FCS program by providing a stable, dedicated brigade-size unit to support FCS throughout the course of its developmental and operational testing.
- Armor upgrades for the MGV are a technological challenge for the FCS program and are critical to the fielding of operationally effective, suitable, and survivable MGVs.
- Overall platform survivability will be dependent upon an effective Hit Avoidance System that includes an Active Protection System. While Active Protection System technologies are showing some promise in testing, it is not yet clear if their performance will make up for lesser levels of MGV armor protection than those found in current force combat vehicles such as the Abrams and Bradley.

- The FCS program continues to synchronize Joint Tactical Radio System (JTRS) and Warfighting Information Network -Tactical (WIN-T) systems development schedules. Progress is being made, but this remains a significant risk area for the FCS program. The effectiveness of the FCS battle command network will depend upon JTRS and WIN-T performance.
- Adequate operational testing of the FCS BCT requires a high fidelity Real Time Casualty Assessment (RTCA) system. The ability to adequately evaluate the force-level lethality and survivability of the FBCT is highly dependent upon such RTCA.

Recommendations

- Status of Previous Recommendations. The program is addressing the 10 previous recommendations.
- FY08 Recommendations.
 1. In the FY09 Test and Evaluation Master Plan update, the FCS program must:
 - Retain the existing planned series of operational test events culminating in an IOT&E with a fully equipped FCS BCT operating in a sophisticated and robust enemy threat environment. The live brigade-size IOT&E will be essential to assessing the operational effectiveness and suitability of the FCS system-of-systems.
 - Clarify the path for developing and integrating the evolving MGV armor upgrades.
 2. The Army should review its test instrumentation development and procurement strategy to ensure that an adequate high fidelity RTCA system is available to support FCS operational testing.

ARMY PROGRAMS