

# FCS AND THE UNIT OF ACTION — ACCELERATING TECHNOLOGY TO THE MODULAR FORCE

## An Interview With BG(P) Charles A. Cartwright

Meg Williams

**B** G(P) Charles A. Cartwright, Program Manager Unit of Action (PM UA), recently took time out of his busy schedule to discuss Future Combat Systems (FCS) and PM UA's transformation goals.

FCS will provide the Army with networked air- and ground-based maneuver, maneuver support and sustainment systems that will allow warfighters to better counter today's adaptive adversaries. Here, Soldiers from the 3rd Armored Cavalry Regiment prepare their M1A2 Abrams tank for border security operations along Iraq's border with Syria. (U.S. Navy photo by PH2 Robert M. Schalk.)

**Q.** After several studies, the Army published *The Army Vision* prescribing the key tenets for transforming the Army from the Current to Future Force. Can you tell us how the UA and FCS will help accomplish the Army's transformation goals in the near term?

**A.** Change in wartime requires dealing concurrently with both current and future needs. Modular Forces and FCS act in tandem to solve immediate and future shortfalls. The Army is applying lessons learned from today's fight to Future Force programs, even if that means adjusting their direction and timing.

The primary difference between FCS and the Modular Force is that the current Modular Force uses the "organizational variable" as the primary near-term means to achieve operational requirements, while FCS-equipped UA will use the "materiel variable" applied to a matured modular organization to move us closer to achieving operational needs for the projected operational environment.

Modular Brigade Combat Teams (BCTs) address immediate Army shortfalls and urgent force-capability gaps using organizational changes and systems/technologies available "off-the-shelf" to reset the force. Modular Force sets several conditions for FCS success — doctrine, organization, training and leader development — thus reducing risk. The FCS program is our major materiel developmental effort to deliver future capabilities such as battle command; manned ground vehicles (MGVs) with agility, mobility, lethality and survivability; and fully networked unmanned aerial vehicles

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Joe Emerson of Northrop Grumman UMS explains Fire Scout capabilities to BG(P) Cartwright (right) and COL Lingenfelter. (Photo courtesy of PM UA.)

(UAVs) and unmanned ground vehicles (UGVs). These are tied directly to achieving concepts and capabilities to meet the Joint Force's future needs.

FCS accelerates technologies to the current Modular Force through spin outs (SOs) of selected FCS capabilities such as networks, UGVs, UAVs, sensors and unattended munitions. The FCS-equipped UA is one type of modular BCT — Heavy, Infantry, Stryker and FCS — for the Future Force mix to counter adaptive adversaries using antiaccess strategies and technology proliferation.

**Q.** The UA/FCS program is more than just new technology. How have Lean Manufacturing, Six Sigma and Value Stream Analysis helped position the Army for success?

**A.** Affordability is driven into designs through the early use of advanced analysis tools and lean concepts. During the design phase, 70-80 percent of a product's cost is fixed. Applying these lean tools will result in reduced

cost, time, inventory and defects. Deploying lean tools will help shape the industrial base by eliminating unnecessary capital expenditures, promoting lean production-process design and creating an infrastructure that continuously improves cost, quality and schedule throughout the product life cycle. For example, a Design Commonality Team has been established for the Integrated Computer System (ICS). This team includes supplier management; reliability, availability and maintainability; logistics; operations; and production planning representatives. One design goal is to make the ICS interchangeable between MGUV, UGV and UAV platforms. ICS versions will be fielded across Current Force platforms. The team is well aware of the impacts their early design decisions will have on unit cost as well as life-cycle cost. The design team is actively recruiting inputs from all disciplines to assist in trade decisions made in early design phases.

**Q.** The enemy and "battlefield" have changed dramatically since *Operation Desert Storm*. Ongoing asymmetric operations in Iraq and Afghanistan today are forcing the Army to reevaluate its warfighting doctrine, tactics, techniques and procedures. How will the UA/FCS spearhead this change as

### the Army moves toward network-centric operations and a Modular Force capable of sustained Joint and expeditionary operations?

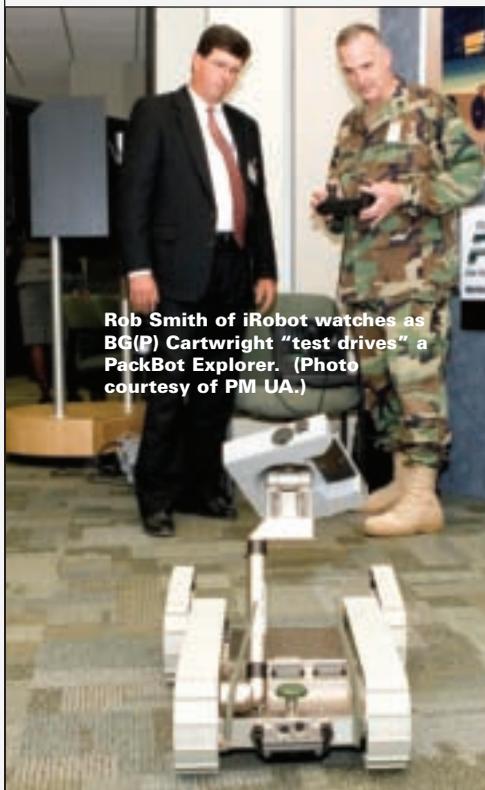
**A.** Modular Forces and the FCS program work in tandem to accelerate fielding of selected FCS capabilities such as networks, sensors, unattended munitions, Non-Line-of-Sight Launch System (NLOS-LS), UGVs and UAVs through spiraling to the Modular Force. In light of urgent demands today for an Army engaged in war, significant adjustments have been made in the FCS program that will result in an earlier SO of available technologies as soon as they can reasonably be incorporated into the force. The first SO begins fielding in FY08 and consists of prototypes fielded to the Evaluation BCT. Following successful evaluation, SO1 production and fielding to Current Force units will commence in 2010. This process will be repeated for three successive SOs of FCS capabilities.

The FCS-equipped Modular Force is designed to ensure a campaign-quality Army. FCS will consist of a family of advanced, networked air- and ground-based maneuver, maneuver support and sustainment systems. They employ a revolutionary, integrated architecture to help meet the future Joint and Army commanders' requirements. The FCS-equipped UA is a network-enabled force. Its vast sensor array will dramatically improve a commander's situational awareness (SA). Sensor-shooter relationships begin with the Soldier and exist throughout the formation, allowing the UA to accurately direct internally generated effects or those generated from supporting units and Joint assets. These will enable improved situational understanding and operations at a synchronization level heretofore unachievable. FCS will enable the networked maneuver UA to develop the

situation in and out of contact, set conditions, maneuver to positions of advantage and destroy the enemy.

### Q. Since reviewing "lessons learned" from the global war on terrorism, the Army has announced that it is accelerating delivery of selected UA/FCS capabilities to the Current Force. Which technologies will be accelerated and into what kinds of platforms?

**A.** FCS technologies that are sufficiently mature for spiral to the Current Force will be issued in increments starting in FY08. The strategy for the first SO is to position into the Abrams tank, Bradley Fighting Vehicle and Humvee the Future Force network backbone consisting of a high-capacity FCS computer, the FCS software operating system, FCS battle command and network management systems. These capabilities successively grow with each SO increment, ultimately allowing the Current Force to grow in capability as we field the FCS UAs. FCS battle command capability will provide the Current Force the ability



Rob Smith of iRobot watches as BG(P) Cartwright "test drives" a PackBot Explorer. (Photo courtesy of PM UA.)

to control FCS-provided sensors and munitions and perform data management and fusion of information necessary to give the tactical commander increased battlespace SA. SO-provided sensors and munitions include the Unattended Ground Sensors for both tactical and urban environments; Intelligent Munitions System, which is a Future Force mine system; NLOS-LS 40-kilometer Precision Attack Missile; and the versatile collection of attack, reconnaissance and transport UGVs. Selected FCS sensors and communication relay packages will be provided to UAVs to allow greater SA and operating range for the tactical formations.

### Q. Secretary of the Army Dr. Francis J. Harvey said that after a 2-month review, the Army will restructure the FCS program from an Other Transactional Authority (OTA) to a traditional contract. What changes do you foresee and will this affect the program's timeline?

**A.** The most notable changes between our existing OTA and the resultant *Federal Acquisition Regulation (FAR)* contract will be the addition of numerous *FAR* general provisions and a revised fee structure. The current OTA's main portions, such as scope of work, schedule and articles, will be transposed virtually intact into a *FAR*-based contract format. There may be a few special provisions inserted into the *FAR* contract to maintain certain program management techniques that were contained in the OTA as articles. The transition from an OTA to a *FAR*-based contract does not add time to our development schedule in any way.

### Q. May 26 was the projected date for the Defense Acquisition Board Milestone B update. Can you tell us what this entailed and what the Army accomplished?

## FUTURE COMBAT SYSTEMS SYSTEM-OF-SYSTEMS

- 1 Medical Treatment and Evacuation Vehicle
- 2 FCS Recovery and Maintenance Vehicle
- 3 Command and Control Vehicle
- 4 Reconnaissance and Surveillance Vehicle
- 5 Mounted Combat System
- 6 Infantry Carrier Vehicle
- 7 Armed Robotic Vehicle (ARV)-Reconnaissance Surveillance and Target Acquisition
- 8 ARV-Assault
- 9 Intelligent Munitions Systems (IMS) 1
- 10 IMS 2
- 11 IMS 3
- 12 Multifunctional Utility/Logistics Equipment (MULE)-Countermine
- 13 MULE-Transport
- 14 MULE A
- 15 Non-Line-of-Sight Mortar (NLOS-M)
- 16 NLOS Launch System
- 17 NLOS Cannon
- 18 Small (Manpackable) Unmanned Ground Vehicle
- 19 Unmanned Aerial Vehicle (UAV) Class I
- 20 UAV Class II
- 21 UAV Class III
- 22 UAV Class IV
- 23 Soldier
- 24 Unattended Ground Sensor





An Office of the Secretary of Defense-level FCS program review chaired by Under Secretary of Defense for Acquisition, Technology and Logistics Ken Krieg was successfully completed June 21, 2005. The review focused on strategic departmental issues rather than program details. In addition to me, Army participants included Secretary Harvey; Office of the Secretary of Defense Administration and Management Director Raymond F. DuBois Jr.; Assistant Secretary of the Army for Acquisition, Logistics and Technology Claude M. Bolton Jr.; and U.S. Army Training and Doctrine Command Deputy Commanding General/Director Futures Center LTG John M. Curran. The review was very positive.

Key discussion topics included the FCS network and integration with the DOD Joint network, multimodal — including C-130 — transportability, *Quadrennial Defense Review* implications and the long-term Army plan for the Modular Current and Future Force mix.

**Q. Please tell us about the new System-of-Systems Integration Lab (SoSIL) that just opened in Huntington Beach, CA.**

**A.** SoSIL is the collection of laboratories and test facilities housing the hardware and software needed to develop, analyze, integrate and test various systems for the Army's FCS program.

Each FCS system, such as UAV, MGV or UGV, will be represented and developed as a separate test article. SoSIL will interconnect the labs developing these articles into a secure wide-area network (WAN) to support a near-real-time distributed test capability across the United States. Additionally, SoSIL will interconnect analysis labs and government test sites on the same network. The WAN's basic design will



**BG(P) Cartwright and Michael Thome examine the Honeywell Class 1 UAV. (Photo courtesy of PM UA.)**

support the timely and secure distribution of data, voice and video service to these multiple sites.

SoSIL will connect multiple geographically distributed sites throughout the United States. The network will provide secure connectivity to both FCS Lead Systems Integrator and FCS industry partners/One Team integration and analysis labs as well as to government test/experimentation facilities. The central integration facility is located at the Boeing facility in Huntington Beach. It will have approximately 100 personnel and can accommodate more than 300 additional staff when required by specific activities.

SoSIL will support the following data transmission categories:

- Near real-time
- Viewing portal
- Software updates
- Advanced Collaborative Environment

Its primary function will be to provide seamless secure transmission of near-real-time test and analysis data between geographically dispersed FCS sites. Real-time test data will always be given the highest priority for transmission across the SoSIL. Concurrent with support for formal test events, the

FCS Distributed Network will support secure data transmission during informal development and integration testing among sites.

SoSIL will also support data transmission to viewing portals. Viewing portals will allow key observers to view data on remote displays and monitor near-real-time video and audio streams of activities taking place in multiple locations. SoSIL is designed to allow for the addition of new viewing portals as required.

A third data category supported by SoSIL will be software updates. As new software versions are developed and made available, the SoSIL will be used to securely transfer these updates to the appropriate test sites. Routine software updates will normally be transmitted at a lower priority, but SoSIL will support assigning a higher priority to any critical updates required during designated activities.

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