Future Combat Systems
DARPATech 2000

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The Future Combat Systems (FCS) Program is a collaborative program between the Defense Advanced Research Projects Agency (DARPA) and the US Army to provide for the evaluation and competitive demonstration of the Future Combat Systems.

The FCS Program will:
- Define and validate FCS design/operational concepts using modeling and simulation and surrogate exercises
- Develop key enabling technologies for distributed lighter forces
- Fabricate and test a multi-mission FCS Demonstrator suitable for EMD and production
Structured to support the vision of the Objective Force.

Contains the key elements representing the user, the technologist, and the developer.

Built around a core team to execute the program.

Supported by directly related DARPA risk reduction initiatives, Army S&T and a TRADOC TSM.

Structured to share information and encourage Team innovation.
The Army Transformation

Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable.
**FCS Way Ahead**
-- “System” FUE FY12

**DARPA S&T Programs**
- DARPA Lead Joint S&T Program

**Army S&T Programs**
- FSCS ATD
- FCS Technologies

**FCS Technologies**
- Tech Demos (remaining functions)
- FCS EMD

**DARPA Lead Joint S&T Program**
- Concepts
- Experiments
- Network Fires
- Robotics
- Organic 3D Targeting
- Mobile C2

**Tech Readiness Decision**
- EMD Readiness Decision

**Production**
- Block 1 Upgrades ATDs
- Block 1 Upgrades EMD

FY00 FY01 FY02 FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12
Total Collaborative Effort to Support FCS

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- **CHPS**
  - Robotics
  - Unmanned Ground Vehicle

- **SUO**
  - Maneuver C3

- **AFSS**
  - Maneuver BLOS Networked Fires Weapon

- **A160**
  - Organic All-Weather Targeting Vehicle
  - All-Weather Surveillance and Targeting Sensor

**Timeline:**
- **Design Competition**
  - Concept Development / Modeling and Simulation
  - Government-Run Experiments
- **Preliminary Design**
- **Detailed Design**
- **Build**
- **Shakeout**

**Key Events:**
- **T & E**
  - SOG review

**Systems:**
- Robotic Unmanned Ground Vehicle
- BLOS Surveillance & Targeting System

**Additional Notes:**
- AUTONOMY
- VISION
- MOBILITY
- DESIGN
- COMMAND & CONTROL
- COMMS
- LOITER ATTACK
- PRECISION ATTACK
- 3D PLATFORM
- NEAR ALL WEATHER
- ALL WEATHER
- PRECISION SENSING

**IOR:**
- IOR 1
- IOR 2
Exploit Battlefield Non-Linearities Using Technology to Reduce the Size of Platforms and the Force

From This...

To This...

Network Centric Distributed Platforms

Small Unit UAV

Other Layered Sensors

Robotic Sensor

Robotic Direct Fire

Distributed Fire Mechanisms

Robotic NLOS Fire

Manned C2/Infantry Squad

Future Combat Systems
### The Boeing Team
- The Boeing Company, Seattle, WA
- New Definitions, Inc., Tacoma, WA
- Vector Research, Inc., Ann Arbor, MI
- Whitney, Bradley & Brown, Inc., Vienna, VA
- Signature Research, Inc., Calumet, MI
- National Institute of Standards and Technology (NIST), Gaithersburg, MD
- Rockwell Science Center, Thousand Oaks, CA
- Krauss-Maffei Wegmann (KMW), Germany

### Team Gladiator (Consortium)
- TRW
- Lockheed Martin
- CSC/Nichols Research
- Battelle Institute
- Carnegie Mellon
- IITRI/AB Technologies

### Team FoCus Vision (Consortium)
- Team FoCuS vision led by General Dynamics Land Systems Inc., Sterling Heights, Michigan and Raytheon Company, Plano, Texas.

*Other participants with GDLS and Raytheon include:*
- Aurora Flight Sciences
- Carnegie-Mellon University
- Honeywell
- Maxwell Physics International
- Stanford Research Institute International
- Sensis
- Sensor.com Wireless Integrated Network Sensors
- Whitney Bradley & Brown Inc.
- Los Alamos National Laboratory

### Team Full Spectrum
- SAIC
- United Defense, LP
- ITT Industries
- Northrop Grumman Corp
- Logistics Management Institute (LMI)
- SRI International
- Strategic Perspectives Inc.
- Omnitech Robotics International LLS
- University of Texas Center for Electromechanics
- VRI
Tailorable multipurpose force comprising an adaptable system of robotic-enhanced platforms brought together by a remoted distributed and non-dedicated architecture.
• Transform traditional stovepipe functions into a netcentric system of systems
• Maneuver: through speed, control, protection and deception:
  – To place fires on the enemy
  – To gain positional advantage
  – To increase the OPTEMPO of the battle
Concept - Team Full Spectrum
Concepts - Team Gladiator

FCS Smart Sensor Web Provides Selectable Resolution to Support the Commander’s Course of Action

- Manned/Unmanned Ground, Air, Space Sensors Provide All Weather Day/Night Battlefield Coverage
- Ultrareliable C4ISR Architecture Provides the Commander’s Common Operational Picture
- The Common Operational Picture is Scalable and Tailorable for all Levels of Command and Control

The FCS Three-Tier Nested Communications Network Ensures High Quality and High Speed Service to the Commanders

- Using a Ground to Ground, Line of Sight Flood Routed System, Augmented by a Secondary Star Topology, Implemented through UAVs and Low Bandwidth, High Availability Direct to Satellite Links Provides on-the-Move Communications to and from Every Platform

FCS Robotic and Manned Platforms Engage Decisively at the Time and Place of the Commander’s Choosing

Alternative FCS Capabilities
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**Agreement Award**

**Kickoff Meeting**

**1st order system architecture**

**Preliminary Concepts Data**

**Technology Investment Review**

+ Gov't. Feedback on Concepts

**F&S Conc Iteration 2**

**F&S Conc Iteration 3**

**F&S Conc Iteration 4**

**Program Summary Briefing**

**Last Data Delivery for Gov't M&S**

**Draft Program Summary Report**

**Program Summary Report**

**Force Decomposition/ Requirements Exploration**

**Technology Survey**

**Trade Studies**

**Initial FCS Concepts**

**Initial FCS Characterization**

**Final FCS Concepts & Characterization**

**Integrated Data Environment**

**Management/Support**
Diverse Team backgrounds bring different approaches to defining FCS Force solutions.

Team taxonomies provide necessary skill and facility mixes to address the needs of the total program.

Teams, augmented by government expertise and technology, will significantly reduce overall program risk.

We will understand “what makes a difference” based on government and Team modeling and limited and focused government testing.

Capability to “reteam” in the next phase will capture the “best of the best.”
MOA is signed.

Concept Team Agreements have been awarded and we are underway.

Program relationships, organizational structure, and significant cost sharing (including Army, DARPA and Industry teams) are in place. PM will transition with program to promote continuity.

Industry and Government teams are solid and enthusiasm levels are high.

Program is structured to meet 2012 FUE.