

**FUTURE COMBAT SYSTEMS**



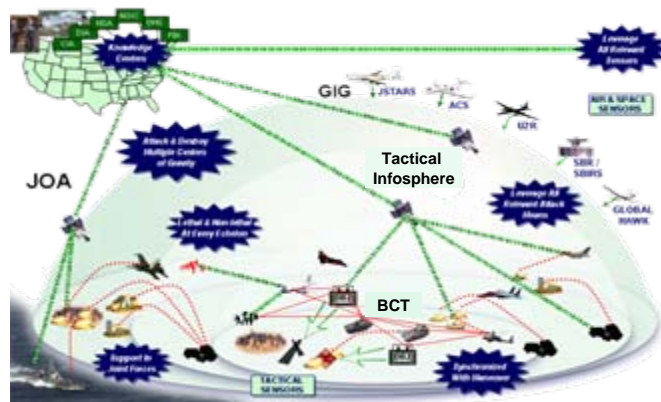
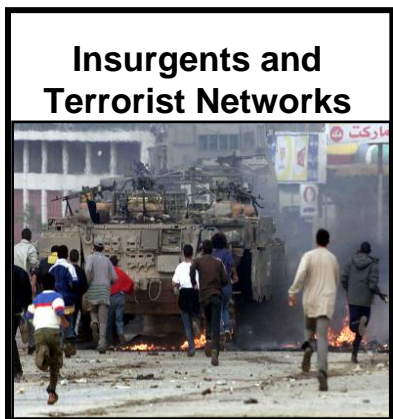
*One Team-The Army/Defense/Industry*

# Future Combat Systems Overview

**John F. Kelley**  
Program Director  
Supplier Management  
Future Combat Systems

# Why Future Combat Systems

- Gaining control of the ground dimension is the greatest military challenge of the 21<sup>st</sup> century
- FCS is the most affordable, rapidly deployable, effective AND survivable solution for 4-6% of Army annual budget
- Overwhelming land dominance from pre-insurgency through full scale combat
- FCS has twice as many soldiers under armor, closer to the enemy, longer
- Networks Battle Command to all BCT Soldiers and Systems
- Double the infantryman with half the logistical footprint



Current Force



FCS

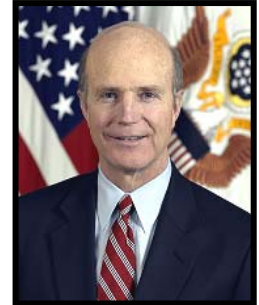




# Army Leadership's View of FCS

***“We never want a fair fight, and with FCS, our Soldiers will have the ability to see first, understand first, and act first. FCS serves the present through spin-outs, but it is the future. We must keep it on track.”***

*The Honorable Pete Geren - Secretary of the Army  
AUSA Institute of Land Warfare Breakfast - May 10, 2007*



**The Honorable Pete Geren  
Secretary of the Army**

***“FCS technologies will be vital to the Army’s ability to fight a nontraditional war such as the combat in Iraq. We’re up against an adaptive, asymmetric enemy who is changing his tactics every day. We need to give our soldiers every advantage.”***

*General George Casey, Jr. – Chief of Staff, U.S. Army  
DefenseNews.com 25 April 2007*



**Gen. George W. Casey, Jr.  
Chief of Staff, U.S. Army**

***“We are taking the “F” in the Future Combat System and making it reality.”***

*The Honorable Claude Bolton - Assistant Secretary of the Army  
AUSA Institute of Land Warfare Breakfast - May 10, 2007*



**The Honorable Claude Bolton  
Assistant Secretary of the Army**

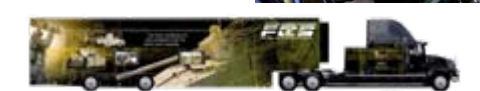
***“The cost in modernizing is first of all a cost in dollars, but failing to modernize is a cost that is sometimes registered in lives.”***

*Lt. General Stephen Speakes – Deputy Chief of Staff, G-8  
Pentagon Roundtable May 15, 2007*

**The Honorable Claude Bolton  
Assistant Secretary of the Army**

# 2007 Highlights

- Successful experiment 1.1 soldier exercise
- Delivered FCS Build 1 software (~5M SLOCs)
- Completed Spin Out 1 CDR; Delivered B-Kits
- Testing of cannon and mortar firing platforms
- Defense Acquisition Board IPR
- FCS mobile demo trailer
- Discovery Channel “Future Weapons”
- Army Evaluation Task Force (AETF)
- Prototype Deliveries & Testing
- Engineering Maturity 1 – Milestone
- Moving into FCS Initial Production Phase



**Strong Momentum...**

# FCS Brigade Combat Team...

## Manned Ground Vehicles (MGV)

Infantry Carrier Vehicle (ICV)



Command and Control Vehicle (C2V)



Mounted Combat System (MCS)



MRM Medium Range Munitions



APS Common Chassis



Reconnaissance And Surveillance Vehicle (RSV)



Non-Line of Sight Mortar (NLOS-M)



Medical Vehicle Treatment (MV-T)



Medical Vehicle Evacuation (MV-E)

FCS Recovery and Maintenance Vehicle (FRMV)



National Centralized Controller

## Unmanned Aerial Systems (UAS)

Class I UAV



Class IV UAV



## Unattended Ground Systems (UGS)

T-UGS



U-UGS



Tactical and Urban Unattended Ground Sensors



Non-Line of Sight Launch System (NLOS-LS)

## Unmanned Ground Vehicles (UGV)

MULE-C



Multifunction Utility/ Logistics and Equipment Countermine and Transport

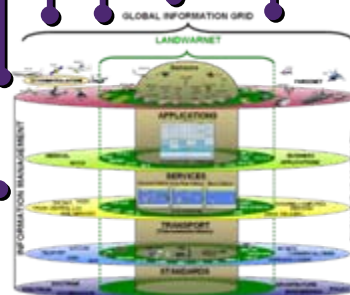
MULE-T



Armed Robotic Vehicle - Assault (Light) (ARV-A-L)

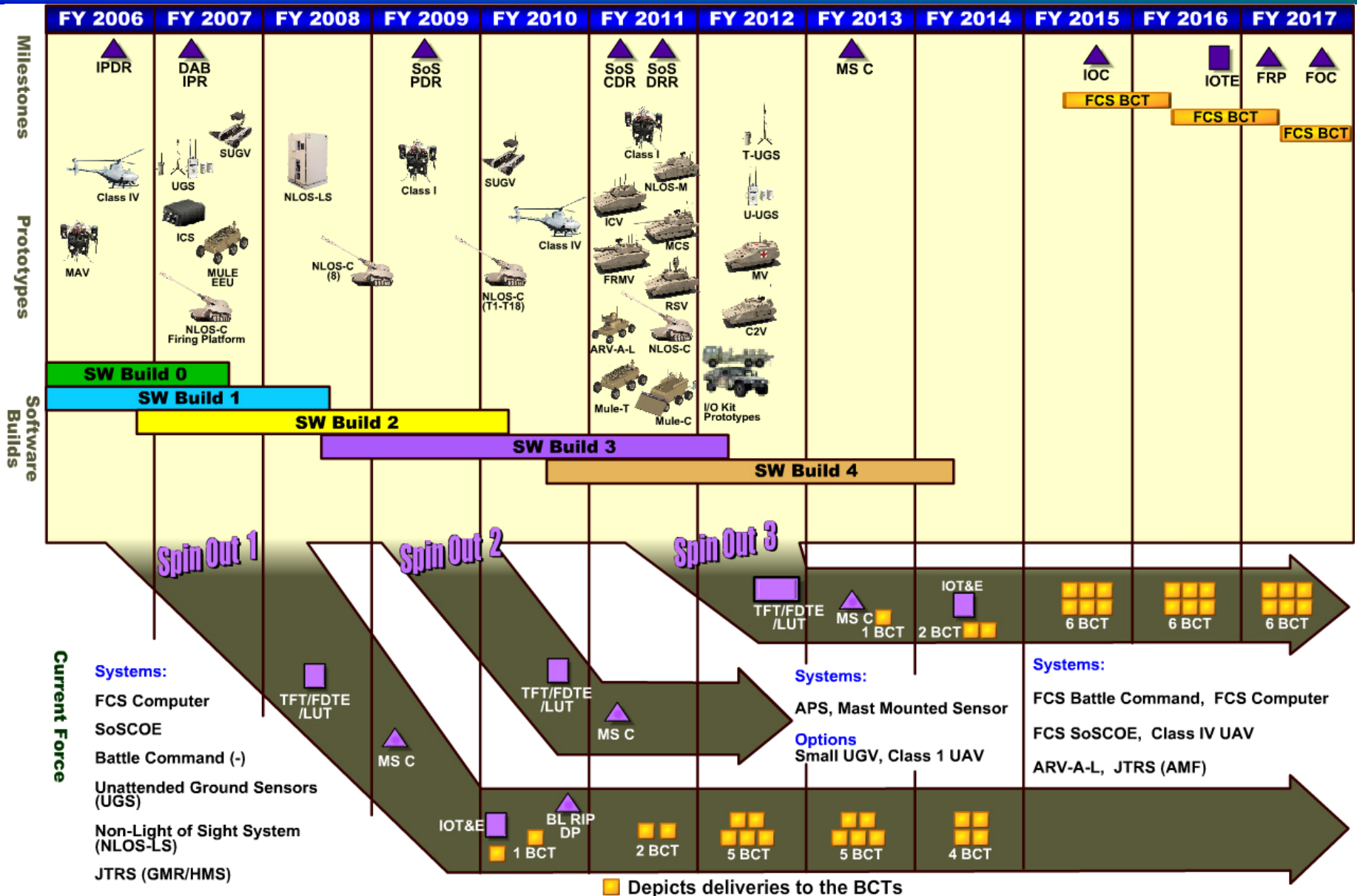


Small UGV (SUGV)





# FCS (BCT) System-of-Systems Schedule

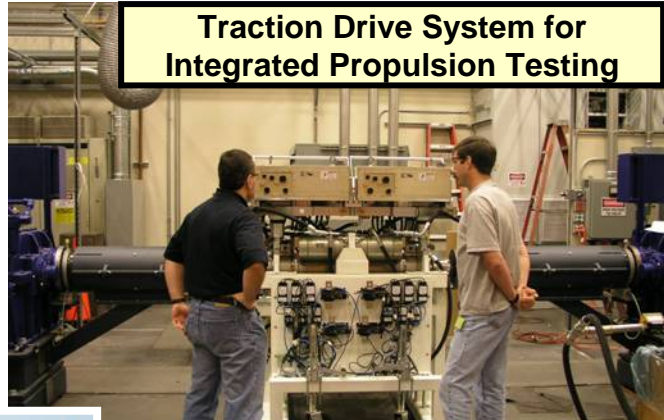


# Manned Ground Vehicles

**C2V / RSV Rooftop De-confliction Test Rig**



**Traction Drive System for Integrated Propulsion Testing**



**NLOS-C 9-Round Max Rate of Fire**



**P1 Chassis**



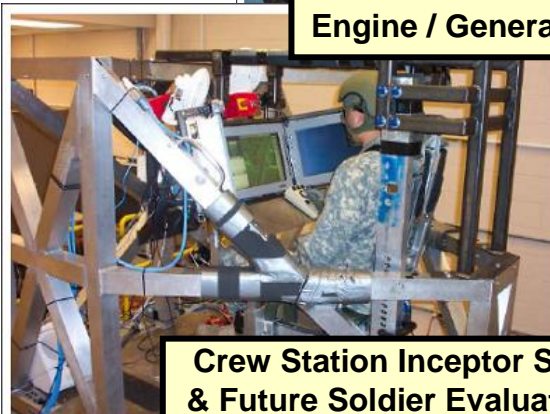
**Engine / Generator in EGTL**



**NLOS-M Round Burst**



**21" Band Track**



**Crew Station Inceptor Seat & Future Soldier Evaluation**



**MCS XM360 Electric Gun Elevation Drive Testing**



# Unmanned Ground Vehicles



Exp. 1.1 SUGV  
 Pre-Prototype  
 On Capitol Hill



SUGV  
 Water &  
 Land Test



SUGV  
 Drop  
 Test

**SUGV**

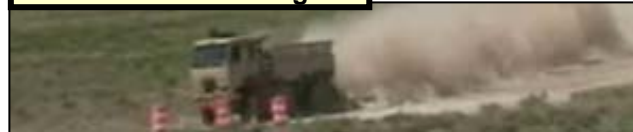


Packbot on  
 Patrol in Iraq

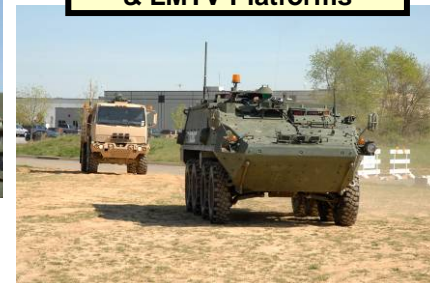
ANS LADAR and Imaging  
 Perception Module (IPM)



Robotic Convoy – Obstacle  
 Avoidance Testing



Robotic Convoy – ANS  
 Integrated onto STRYKER  
 & LMTV Platforms



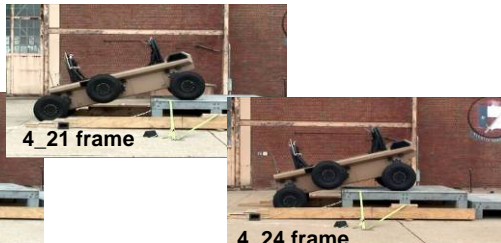
**ANS**



4\_12 frame



4\_15 frame



4\_21 frame

4\_24 frame



4\_28 frame



4\_31 Frame



4\_33 Frame

**MULE**



MULE Testing





# Unmanned Aerial Vehicles (UAV)

## Class I



## Class IV



**Temporary Nose Cone fitted to Class IV UAV (Fire Scout) A1 preparing for 1st ever Engine Run at Moss Point Facility (May 07)**

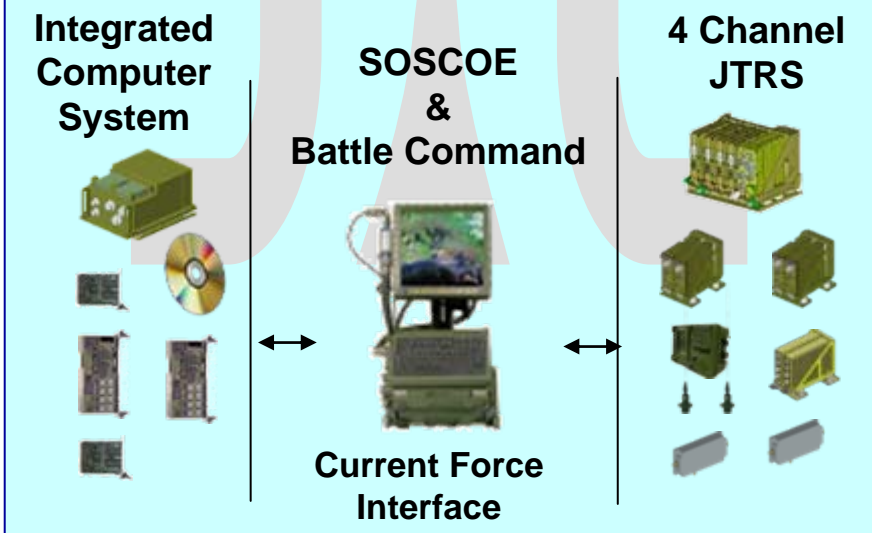
**Navy Milestone C Approval**



# “Spin Out 1” to the Current Force



## Network Capability Integration Kit



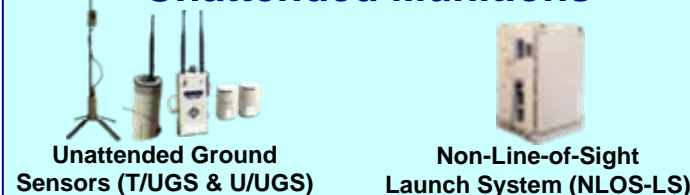
## Capability Improvements:

- Force protection
- Precision networked fires
- Interoperability

## Milestones:

- ✓ Critical Design Review – Q2 FY07
- ✓ First Network Kit Delivery – Q2 FY07
- ✓ Software Qualification – Q4 FY07
  - Limited User Test – Q4 FY08
  - Milestone C – Q2 FY09

## Unattended Munitions



Relevant to Today's Force



# Current To Future Force Through Technology Spin Outs

Near Term (FY 07-08)      Mid Term (FY 09-11)      Far Term (FY 12-17)

## FCS – System Development and Demonstration

### Spin Out 1 FY 2008-10

#### Networked Sensors/ Shooters

- Limited Battle Command
- JTRS (GMR/HMS)
- Unattended ground sensors
- Non-line of sight launch systems

### Spin Out 2 FY 2010-12

#### Systems/ Component

- APS
- Mast Mounted Sensor
- Options:**
- Small UGV
- Class 1 UAV

### Spin Out 3 FY 2012-14

#### Network and Ground/ Air Vehicles

- ABCS to FCS Battle Command
- ARV-A-L
- Small UGV
- Class I UAV
- Class IV UAV

**Core Program Delivery  
FY 2015**

**Joint Networked System of Systems**

**Current**

Fielding 6 current force BCTs/yr (76)

Fielding 15 FCS BCTs

**Future**

Infantry Stryker Heavy

FCS

2004-2006

Lessons learned  
OIF and OEF

RAVEN Tactical UAV  
 Interceptor Body Armor (IBA)  
 Counter IED (Warlock, Duke)  
 Uparmored Vehicles (UAH, AoA)  
 Buffalo mine-clearing vehicle

2006-2010

- ABRAMS-Multiple lethality and survivability enhancements
- Stryker-Enhanced survivability
- HMMWV-Enhanced survivability and reliability
- DCGS-A (V3)(2007)
- Excalibur (2007)
- LUH (2008)
- WIN-T Inc 1 (2008-09)

2010 and beyond

- ABRAMS-3 GEN FLIR and MRM
- Stryker-Enhanced lethality
- GSS (2010-14)
- ARH (2010-2014)
- JTRS AMF (2011-12)
- JTRS (GMR/HMS)
- Apache Longbow Block III (2011)
- JLTV (2012-13)
- WIN-T Inc 2 (2014)

## Additional Developments

# Spin Out 1



B-Kit hardware delivered to Current Force

Local Control Display Device installed into Current Force M1A2 SEP Abrams



B-Kit components installed into Current Force M1A2 SEP Abrams



Soldier placing B-Kit Integrated Computer System (ICS) into Current Force HMMWV



Engineers working at the HB SoSIL



JTRS C1 Radio

## B-Kits

## A-Kits

ICS in Bradley



Abrams





# One Team

**41 States, 220 Congressional Districts, 559 Suppliers**

As of 31 March 2007



**“One Team”  
 Management  
 Framework**



**Best of Industry Approach**

# Future Combat Systems Small Business Supply Base

## Period 7 data as of 3/31/07



34 States, 165 Congressional Districts,  
360 Suppliers



Contract Values >5K for Small Business, >10K for Large Business  
S = Supplier D = District

Period 6  
35 States includes WDC, 180 Congressional Districts, 380 Suppliers  
Contract Values > 5K for Small Business, >10K for Large Business



# How to Get Involved with FCS



- Regularly check the FCS Website Home Page at: [www.boeing.com/fcs](http://www.boeing.com/fcs)
- Located on this website:
  - FCS Business Opportunities of the LSI and its Partners (contacts with websites)
  - Partners' Requests for Quotations / Information
  - Supplier Diversity information (specific LSI / Partner Small Business contacts)
  - FCS calendar with upcoming conferences and events
  - On-line registration form
  - Information on submitting questions
- Reach out to the LSI and Partners to express your interest and capability
- Focus on areas of technology and express interest across the One Team

# FCS External Web Site

- **Website for program information to engage all segments of Industry**
  - Business opportunities across the team including RFI's/RFP's and Industry Day Announcements
    - Notification of opportunities sent to suppliers
    - 1002 registered suppliers
  - LSI/Partner contact information
  - Small business event calendar

Corporate Governance | Employment | Employee/Retiree | Ethics | Suppliers | Secure Login

Select Country / Language

BA stock price: \$47.1 [-1.36] at 12:40 PM ET on Oct 15

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Future Combat Systems (FCS)

FCS Overview

News

## Integrated Defense Systems

### Future Combat Systems

#### About the FCS Program

The Future Combat Systems (FCS) program is an Army modernization initiative designed to link soldiers to a wide range of weapons, sensors, and information systems by means of a mobile ad hoc network architecture that will enable unprecedented levels of joint interoperability, shared situational awareness and the ability to execute highly synchronized mission operations.

**Quick Links:**

- [Partners](#)
- [Request for Information/Proposal](#)
- [FCS Business Opportunities](#)

[Industry Day - Class IV IAW Survivability Sensor Suite](#)

[Register with FCS](#)

#### Quick Links:

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- [FCS Business Opportunities](#)



# Business Opportunities

- Opportunities for both the LSI and partners are listed on or linked to the FCS website
- Opportunities exist for 2nd and 3rd tier support to recent, pending, and future selections
- Examples are as follows:

Manned Ground Vehicles	
ICV, MV & FRMV	C2V, MCS & RSV
<ul style="list-style-type: none"> <li>• Hand and Foot Controls, Intercom Controller and Adaptor</li> <li>• Energy Storage System</li> <li>• Electrical and Hydraulic Components</li> <li>• Machined Parts</li> <li>• Wiring Harnesses</li> </ul> <p>Long-term Opportunities</p> <ul style="list-style-type: none"> <li>• Medium Caliber Gun System</li> <li>• External Power Supply</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical Components</li> <li>• Carbon Monoxide Detection System</li> <li>• Circuit Card Assemblies</li> <li>• Mechanical Cable Assemblies</li> <li>• Fuel Systems</li> <li>• Machined Parts</li> <li>• Flex Harnesses</li> <li>• Power Supplies</li> </ul>
Unmanned Air Vehicle	
Class IV UAV	
<ul style="list-style-type: none"> <li>• Nose Cones</li> <li>• Bottom Farings (Composite Parts)</li> </ul>	
FCS related procurements for Micro Air Vehicle kits	
<ul style="list-style-type: none"> <li>• Cable Assemblies (several configurations)</li> <li>• Antenna Assembly, L-band, GDT</li> <li>• Antenna, GPS</li> <li>• Transmitter, L-band</li> <li>• Battery Assembly, Air Vehicle</li> <li>• Battery Charger Assembly</li> <li>• Connector, 7-pin and dust cover</li> </ul>	

Intelligence, Surveillance, and Reconnaissance
Ground Sensor Integration
<ul style="list-style-type: none"> <li>• Software Products</li> <li>• Technical Writing</li> <li>• Electronic Box Build and Assembly</li> <li>• Engineering Services</li> <li>• Connectors</li> <li>• Cables (RF and Digital)</li> <li>• Optical Components and Assemblies</li> <li>• Circuit Card Assemblies</li> </ul>
C4ISR – Network Systems
Integrated Computer System
<ul style="list-style-type: none"> <li>• Fixed and Removable Storage Media</li> <li>• Storage Controllers</li> <li>• Network Switches and Routers</li> <li>• Firewalls</li> </ul>
Supportability
Platform Soldier – Mission Readiness
<p>Long-term Opportunities</p> <ul style="list-style-type: none"> <li>• Secure Wireless Communications Technology</li> <li>• Advanced Ruggedized Display Technology</li> <li>• Advanced Robotic Controls</li> </ul>

# Looking Ahead

Army Evaluation Task Force



- ✓ Completed Experiment 1.1
  - ✓ Delivered ~5 Million Lines of Software
  - ✓ First Network on Abrams, Bradley, HMMWV
- Army Evaluation Task Force (AETF)
  - Prototype Deliveries & Testing
  - Engineering Maturity 1- Milestone
  - Moving into FCS Initial Production Phase



**Equipping our Joint Warfighters with the World's Best Capabilities**



# Summary

- Program keeping pace with Army needs...Maintain Velocity
- More than 60 test activities underway...All Platforms in Testing
- 2008 is a critical execution year...Systems in Build Phase
- FY08 PB at \$3.6B...RDTE & Production...
- Focused on Our Soldiers....

...The Future is Here Now.



**Equipping our joint warfighters with the world's best capability**

# FY08 Objectives

