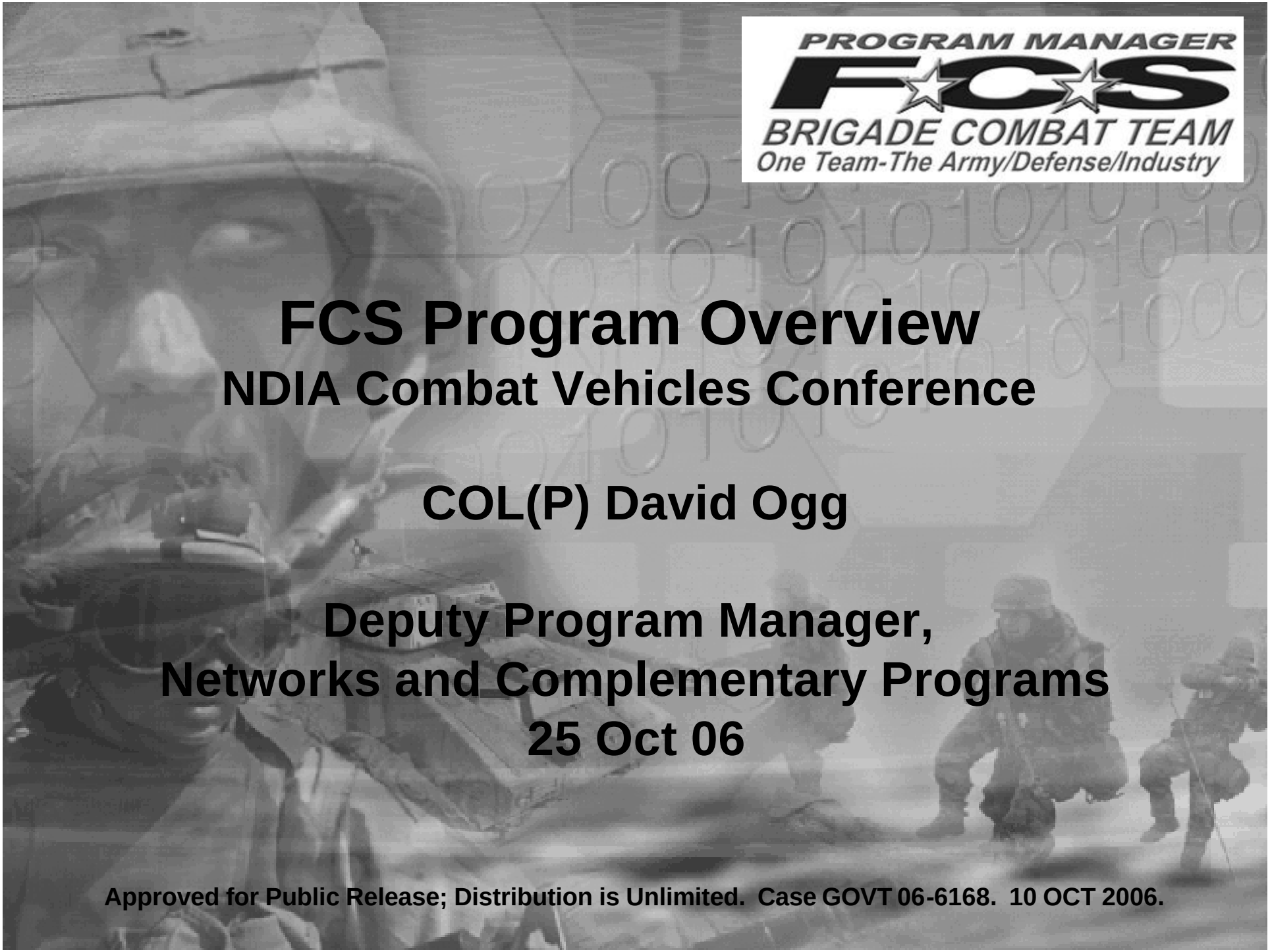


PROGRAM MANAGER
FCS
BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

FCS Program Overview

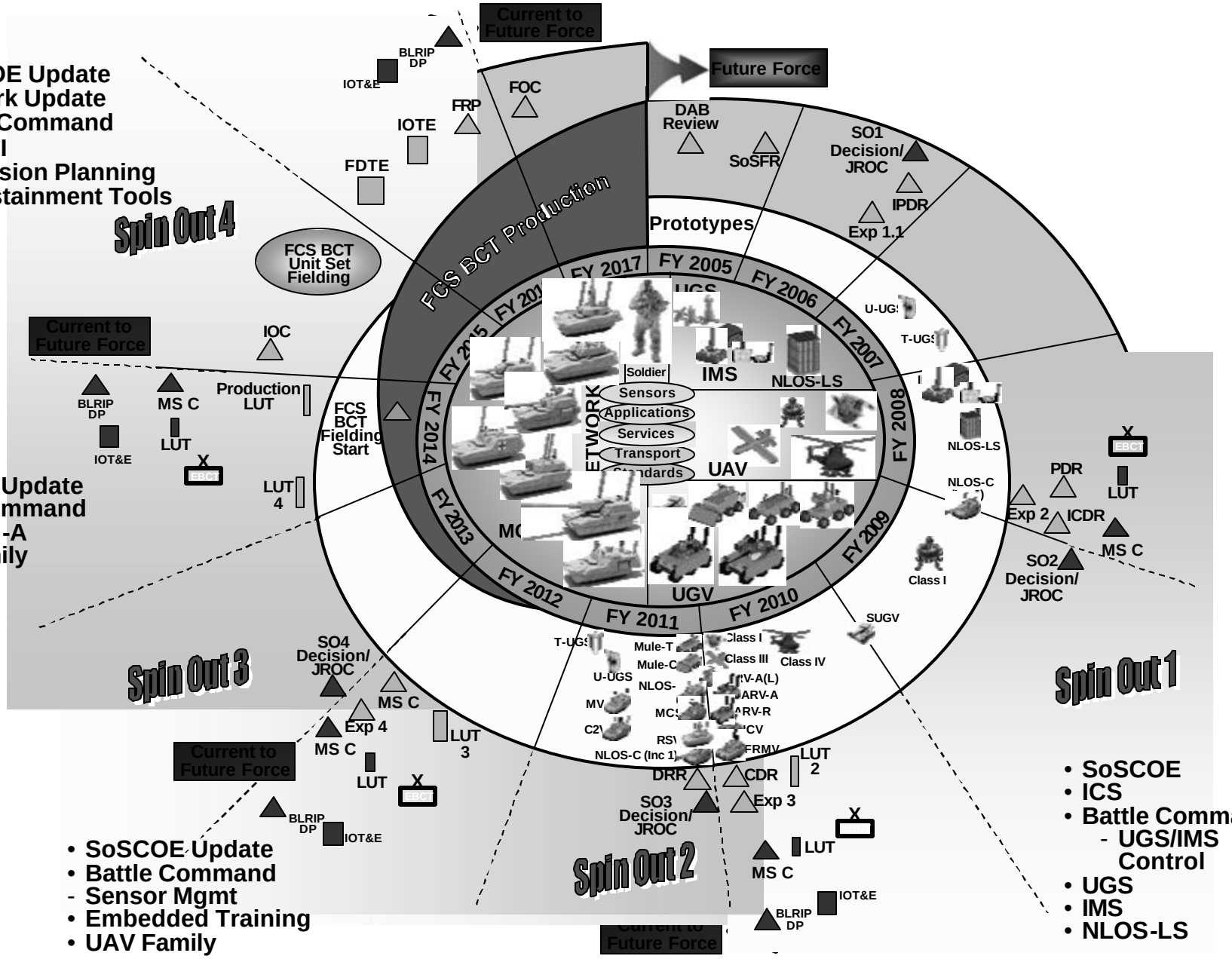
NDIA Combat Vehicles Conference

COL(P) David Ogg

Deputy Program Manager,
Networks and Complementary Programs

25 Oct 06

FCS (BCT) System-of-Systems Schedule



- SoSCOE Update
- Network Update
- Battle Command
  - WMI
  - Mission Planning
  - Sustainment Tools

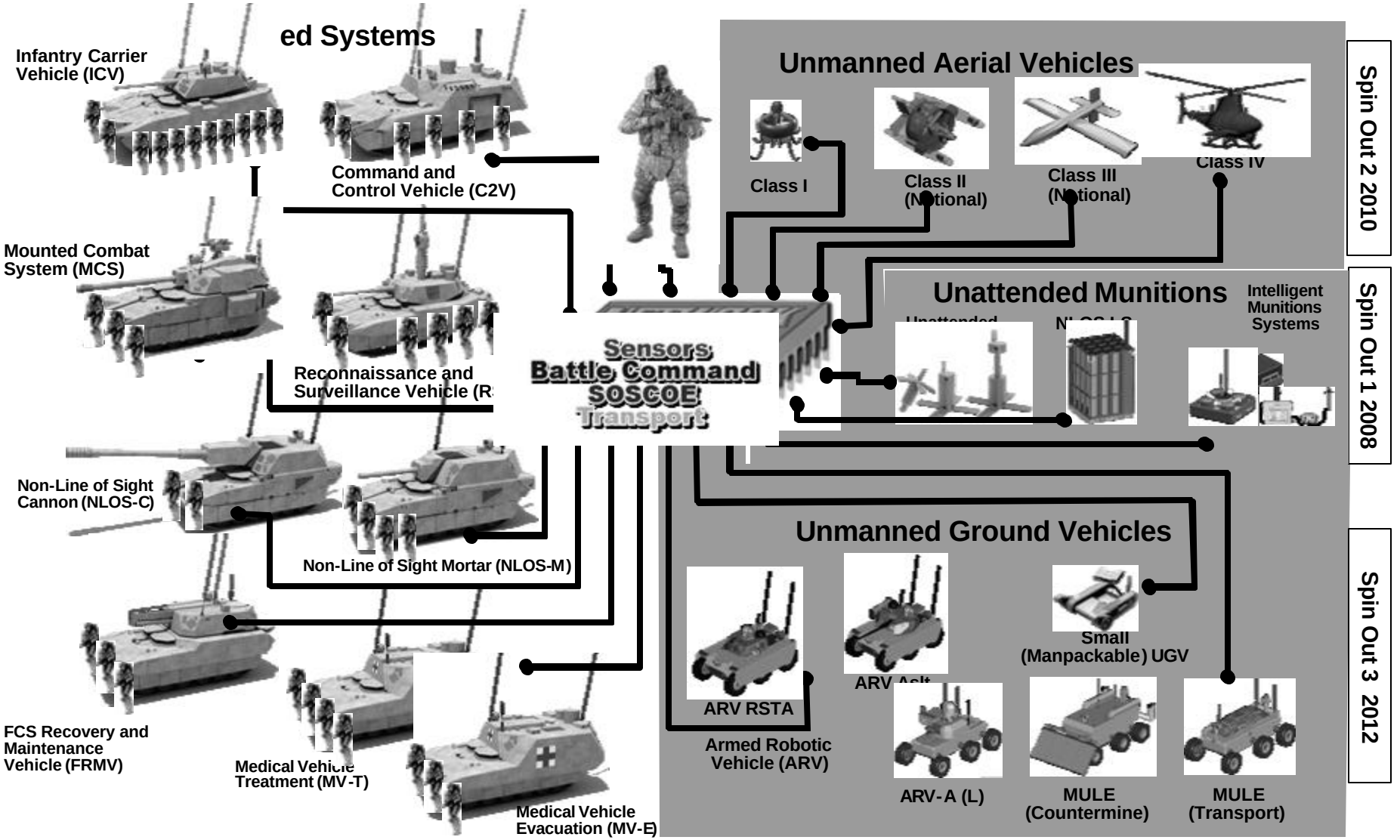
- SoSCOE Update
- Battle Command
  - DCGS-A
- UGV Family

- SoSCOE Update
- Battle Command
- Sensor Mgmt
- Embedded Training
- UAV Family

- SoSCOE
- ICS
- Battle Command
  - UGS/IMS Control
- UGS
- IMS
- NLOS-LS

FCS Brigade Combat Team...
18 Integrated Systems + 1 Network + 1 Soldier

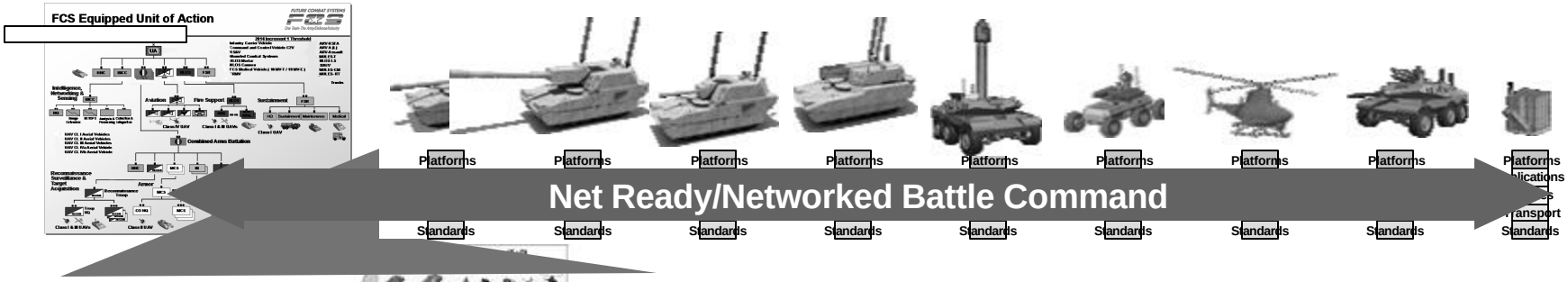
PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

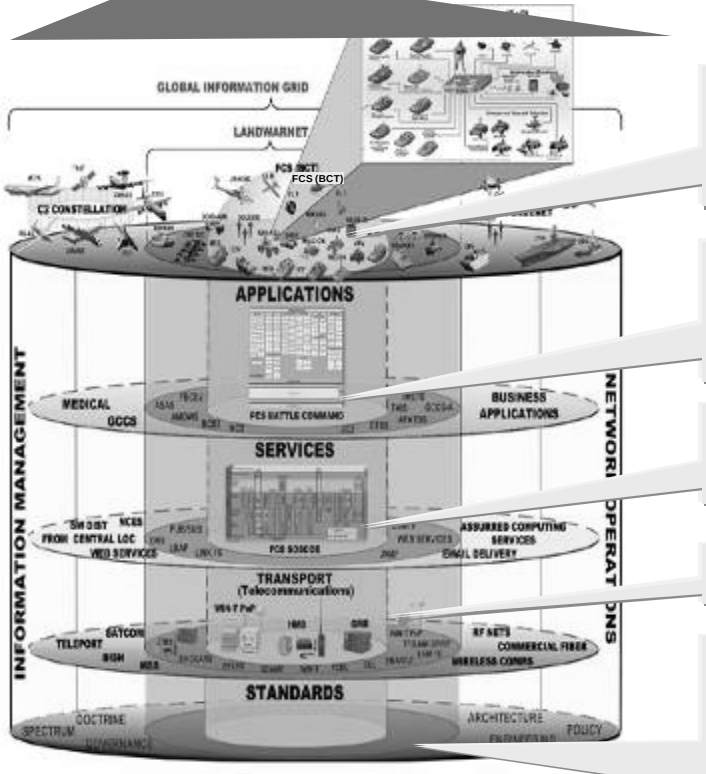


Full Brigade Combat Team… 2014

FCS Layered, Networked Architecture

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry





Command FCS (BCT) system elements are commonly developed to integrate FCS platforms into an integrated system that is geographically dispersed

Battle Command incorporates C2, Intelligence, Surveillance, and Reconnaissance (ISR), Embedded Training, and Sustainment

Net ready information management element of service based architecture

Heterogeneous transport layer enables robustness

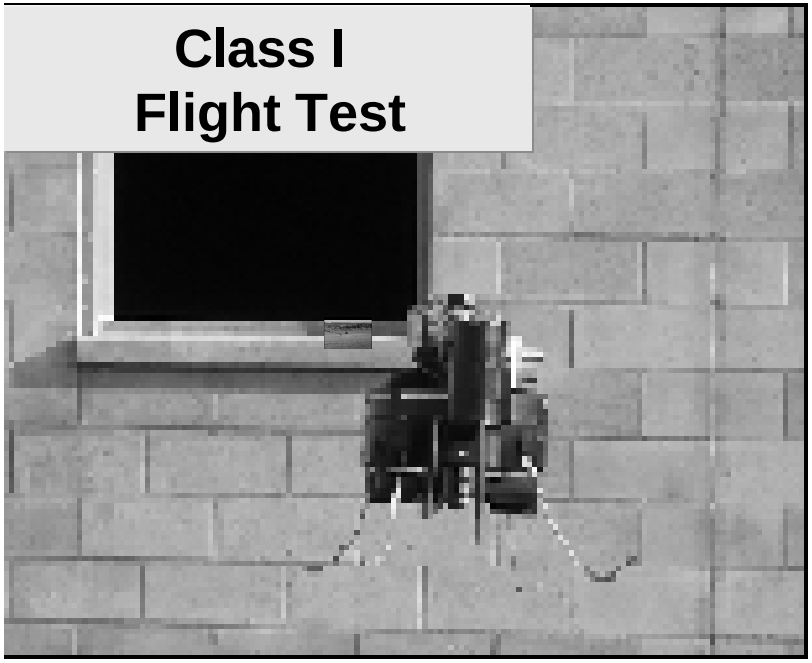
Networked battle command, embedded training, and supportability developed Technical View (TV-1) integrated into SoS level TV-1 standards supporting integration

Integrated Architecture Provides Design-Phase Flexibility and Tactical Adaptability For The Networked FCS (BCT)

Recent Significant Events

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Class I Flight Test



Autonomous Nav System

MULE

Fire Scout Flight Test

Demonstrations and Technologies On Track

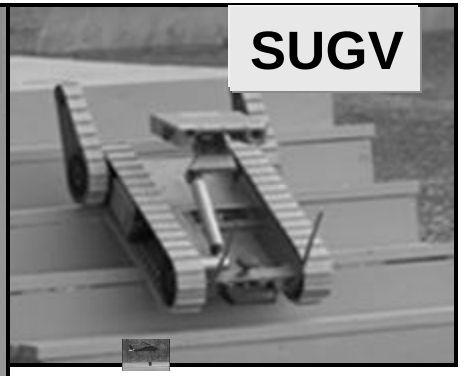
Recent Significant Events

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Integrated Mission Test 0

NLOS-LS Transport

SUGV



JEFX-06

120 MM Cannon

Stryker Leader / Follower

Demonstrations and Technologies On Track

Recent Significant Events

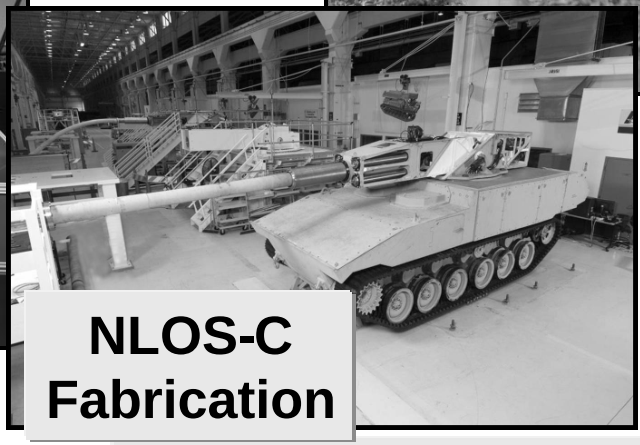
PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry


ARV


Active Protection Systems

Unattended Ground Sensor


SoSIL


NLOS-C Fabrication

Experiment 1.1 Vehicles


NLOS Cannon

Demonstrations and Technologies On Track

Look Ahead Through 2008

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

4Q FY05 | 1Q FY06 | 2Q FY06 | 3Q FY06 | 4Q FY06 | 1Q FY07 | 2Q FY07 | 3Q FY07 | 4Q FY07 | 1Q FY08 | 2Q FY08 | 3Q FY08 | 4Q FY08

Joint Requirements Oversight Council (JROC)

DAB Review

Initial Preliminary Design Review (IPDR)

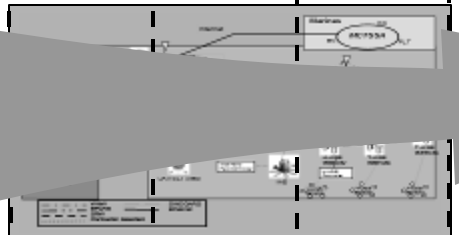
DAB Review (T)

EBCT Stand-up

System-of-Systems Preliminary Design Review (SoSPDR)

Spin Out (SO) 1 MS C

Integration Verification (IV) 0 / Integrated Mission Test (IMT)



Exp 1.1

Lab | Field | Demo

IV1 / IMT

Dry Runs | IMT

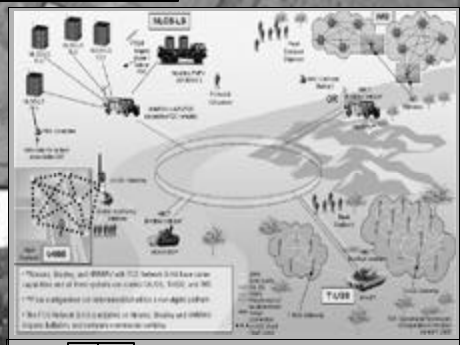
JEFX 06

- IMS, NLOS-LS, UGS IQT
- Bradley, Abrams, HMMWV Developmental test with A/B kits

Network Test and Verification

Network Lab Integration and Testing

SO 1 & Current Systems Integration



FDTE/PT

LD | LUT

SO1

Container Launch Unit (CLU) Qual Test

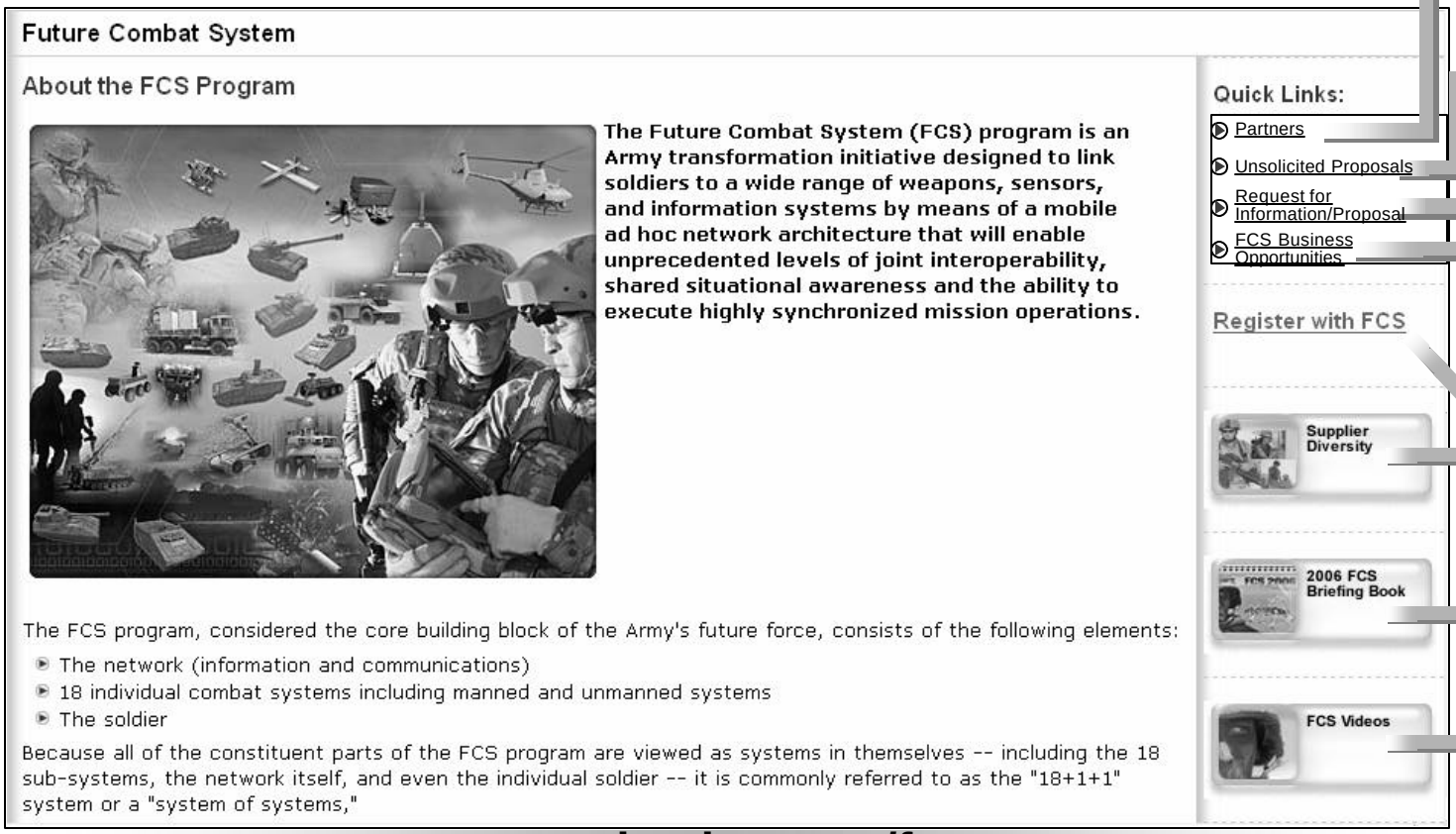
PAM Missile Qual Test

② ② ③ CLU Deliverables

EBCT

How to Get Involved with FCS

FCS External Website



www.boeing.com/fcs

www.army.mil/fcs

- **Partner Lists and Website Links**
- **Submission Of Proposals Not Covered By an RFP**
- **Partner Posted Solicitations for Requests for Information**
- **Partners Opportunities, Contacts, Submittal Form, and LSI Technology Areas of Interest**
- **Supplier Registration Form**
- **Supplier Diversity Information and Contacts**
- **Overview of FCS**
- **Illustrates FCS Functionality**

Panel Speakers

- COL Michael Williamson
  - Project Manager, FCS Networks Systems Integration
- COL Charles Coutteau
  - Project Manager, FCS Manned Systems Integration
- COL Chris DeLuca
  - Project Director, Spin Outs

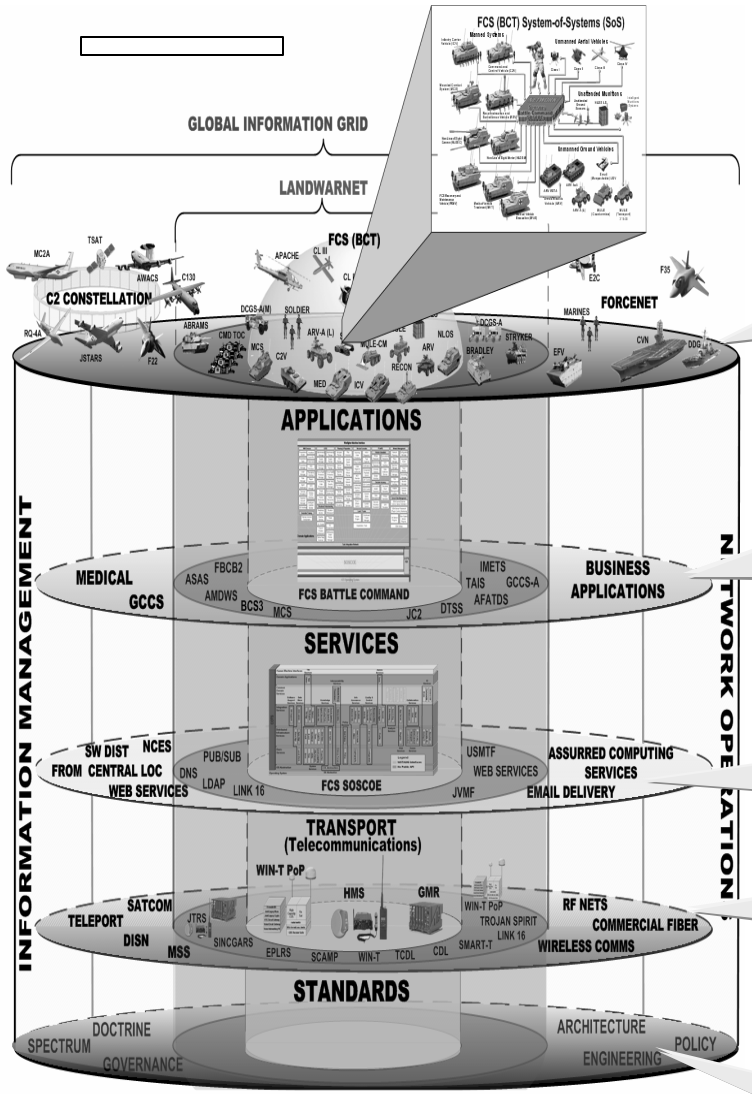
NETWORK SYSTEMS INTEGRATION

COL Michael Williamson

Project Manager
Future Combat Systems, Brigade Combat Team,
Network Systems Integration
PM FCS (BCT) NSI
Fort Monmouth, NJ
732-427-7402

25 October 2006

FCS Layered Network Architecture



Platforms & Sensors

Suite of ground/air, manned/unmanned platforms, with a diverse set of sensors tailored to the warfighters needs

Applications

Battle Command and Control, Intelligence, Surveillance, and Reconnaissance (ISR), Embedded Training, and Sustainment

Services

Common toolset of infrastructure services, (i.e. information assurance, interoperability, etc.)

Transport

Multi-Tiered (Ground, Air, Space), Dynamic, On the Move Communications Network

Standards

Common set of standard to enable interoperability and end-to-end performance metrics

All Systems Include Software & Radios

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Manned Systems

C2V

- *Common - MGV*
- C2V Mission
- C2V Trainer
- WIN-T or HNW

MCS

- *Common - MGV*
- MCS Mission
- MCS Trainer
- or HNW

RSV

- *Common - MGV*
- RSV Mission
- RSV Trainer
- WIN-T or HNW

ICV

- *Common - MGV*
- ICV Mission
- ICV Trainer
- WIN-T or HNW

MV

- *Common - MGV*
- MV Mission
- MV Trainer
- WIN-T or HNW

FRMV

- *Common - MGV*
- FRMV Mission
- FRMV Trainer

NLOS-C

- *Common - MGV*
- NLOS-C Mission
- NLOS-C Trainer

NLOS

- *Common - MGV*
- NLOS-M Mission
- NLOS-M Trainer

Unmanned Ground Vehicles

ARV-A

- *Common - UGV*
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-A Mission
- HNW

SUGV

- *Common - UGV*
- SUGV Mission

ARV-R

- *Common - UGV*
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-R Mission
- HNW

RV-AL

- *Common - UGV*
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-AL Mission

MULE-CM

- *Common - UGV*
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- UGV Countermine, MULE-CM Mission

MULE-T

- *Common - UGV*
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- MULE-T Mission

Unmanned Air Vehicles

s IV

- SOSCOE
- NMS
- Air Sensors
- BCME, PPS, SDM, L1F
- PS-MRS
- ETESS
- Class IV Mission
- JTRS
- HNW

lass III Notional)

- SOSCOE
- NMS
- Air Sensors
- BCME, L1F, PPS, SDM
- PS-MRS
- ETESS
- Class III Mission
- JTRS
- HNW

lass II Notional)

- SOSCOE
- NMS
- Air Sensors
- BCME, PPS, SDM
- PS-MRS
- ETESS
- Class II Mission
- JTRS

Class I

- SOSCOE
- NMS
- Air Sensors
- BCME, SDM
- PS-MRS
- ETESS
- Class I Mission
- JTRS

Unattended Munitions

GS

- SOSCOE
- UGS Mission
- JTRS

IMS

- SOSCOE
- IMS Mission
- JTRS

NLOS-LS

- SOSCOE
- NMS
- CLU Mission
- JTRS

Warfighter Systems

CC

- SOSCOE
- SU, PPS, BCME, WMIS, L1F, SDM
- NMS
- PS-MRS, LDSS
- Embedded Training
- JTRS

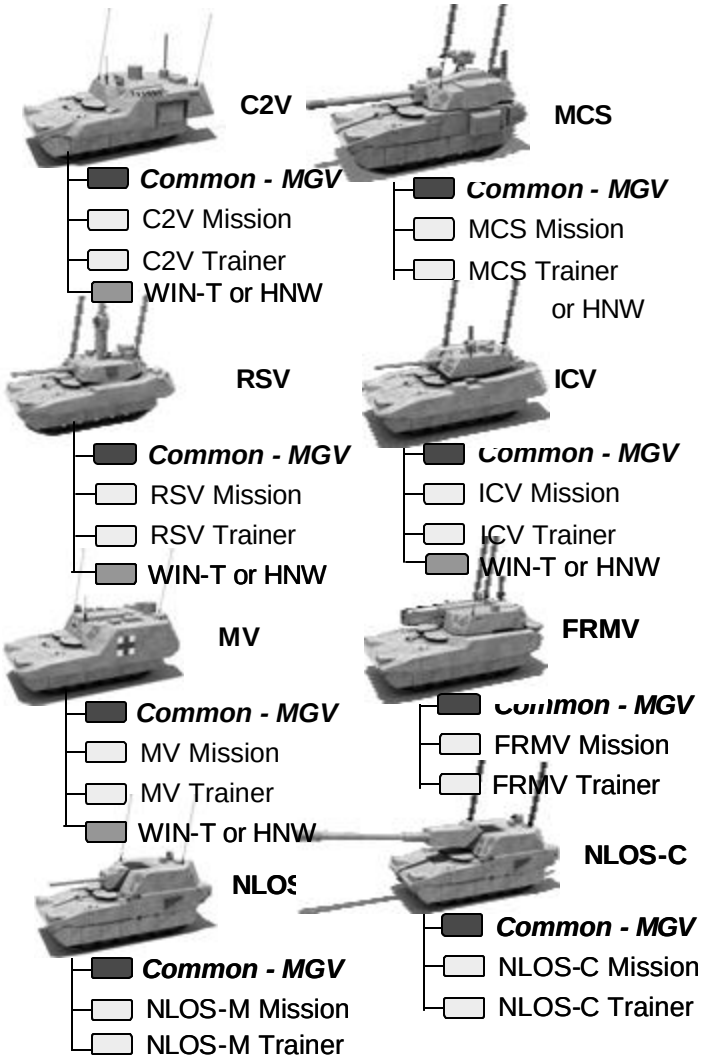
- ***Common – MGV includes:***
- SOSCOE
- SU, PPS, BCME, WMIS, L1F, SDM
- Ground Sensors
- NMS
- PS-MRS, LDSS, IETM
- Embedded Training, including ETESS
- MGV Common: Crew Stations, VMS, Core Vetronics, Powertrain, Traction/Suspension, Chassis Aux System, NBC, ECS, Active Protection, Countermeasures, Defensive Armament, Signature Management
- ANS,
- JTRS, MC4

- ***Common - UGV includes:***
- SOSCOE
- BCME, SDM
- Ground Sensors
- ETESS
- NMS
- JTRS

Note: WIN-T = WIN-T PoP (w/HNW)

- SOSCOE
- C2
- ISR
- Network
- Logistics
- Training
- MGV
- UGV&ANS
- UAV
- Comp Pgm

Manned Systems Include Software & Radios



- ***Common – MGV includes:***
- SOSCOE
- SU, PPS, BCME, WMIS, L1F, SDM
- Ground Sensors
- NMS
- PS-MRS, LDSS, IETM
- Embedded Training, including ETESS
- MGV Common: Crew Stations, VMS, Core Vetronics, Powertrain, Traction/Suspension, Chassis Aux System, NBC, ECS, Active Protection, Countermeasures, Defensive Armament, Signature Management
- ANS,
- JTRS, MC4

Note: WIN-T = WIN-T PoP (w/HNW)

Unmanned Ground Systems Include Software & Radios

ARV-A

- ***Common - UGV***
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-A Mission
- HNW

SUGV

- ***Common - UGV***
- SUGV Mission

ARV-R

- ***Common - UGV***
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-R Mission
- HNW

RV-AL

- ***Common - UGV***
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- ARV-AL Mission

MULE-CM

- ***Common - UGV***
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- UGV Countermine, MULE-CM Mission

MULE-T

- ***Common - UGV***
- SU, PPS, L1F
- PS-MRS
- ANS, VMS
- MULE-T Mission

- ***Common - UGV includes:***
- SOSCOE
- BCME, SDM
- Ground Sensors
- ETESS
- NMS
- JTRS

Note: WIN-T = WIN-T PoP (w/HNW)

Unmanned Air Systems Include Software & Radios

s IV

- SOSCOE
- NMS
- Air Sensors
- BCME, PPS, SDM, L1F
- PS-MRS
- ETESS
- Class IV Mission
- JTRS
- HNW

lass III (Notional)

- SOSCOE
- NMS
- Air Sensors
- BCME, L1F, PPS, SDM
- PS-MRS
- ETESS
- Class III Mission
- JTRS
- HNW

lass II (Notional)

- SOSCOE
- NMS
- Air Sensors
- BCME, PPS, SDM
- PS-MRS
- ETESS
- Class II Mission
- JTRS

Class I

- SOSCOE
- NMS
- Air Sensors
- BCME, SDM
- PS-MRS
- ETESS
- Class I Mission
- JTRS

- SOSCOE
- C2
- ISR
- Network
- Logistics
- Training
- MGV
- UGV&ANS
- UAV
- Comp Pgm

Note: WIN-T = WIN-T PoP (w/HNW)

Unattended Munitions Systems Include Software & Radios

GS

- SOSCOE
- UGS Mission
- JTRS

IMS

- SOSCOE
- IMS Mission
- JTRS

NLOS-LS

- SOSCOE
- NMS
- CLU Mission
- JTRS

- SOSCOE
- C2
- ISR
- Network
- Logistics
- Training
- MGV
- UGV&ANS
- UAV
- Comp Pgm

Note: WIN-T = WIN-T PoP (w/HNW)

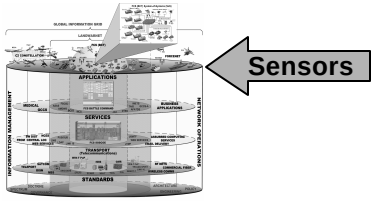
Warfighter Systems Include Software & Radios

CC

- SOSCOE
- SU, PPS, BCME, WMIS, L1F, SDM
- NMS
- PS-MRS, LDSS
- Embedded Training
- JTRS

- SOSCOE
- C2
- ISR
- Network
- Logistics
- Training
- MGV
- UGV&ANS
- UAV
- Comp Pgm

Note: WIN-T = WIN-T PoP (w/HNW)

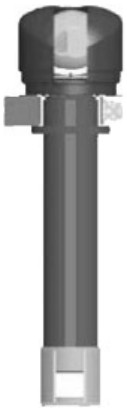


ISR Key Capabilities and Requirements

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

- Functional/Operational Capabilities
  - Situation Awareness/Situation Understanding
    - Wide area search of enemy combat systems, personnel and communication signals
    - Air and ground surveillance with aided target detection and distributed fusion
    - Wide sensing coverage through manned, unmanned and unattended sensors
  - Lethality / Support of networked fires
    - Tracking, designation, combat ID and BDA during target engagements
  - Platform/soldier survivability
    - Detection of enemy fires, munitions and sensors
    - Detection and alerts for CBRN threats
  - Assured Mobility
    - Detection of mines, minefields and obstacles
    - Development of terrain features and trafficability measurements
- Key Requirements
  - Detection ranges of key ISR sensors
  - Probability of detection and false alarm rates for AiTR
  - Surveillance Timelines
  - Target Location Errors
  - IED detection
  - Concurrent operational loading of multi-function sensors
  - Operation in hostile environments
  - MTBEFF
  - AUPC

Electro-Optical Sensor deployed on ground combat platforms

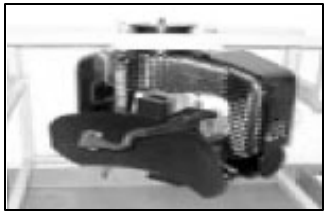


Electro-Optical Sensor deployed on ground R&S platforms

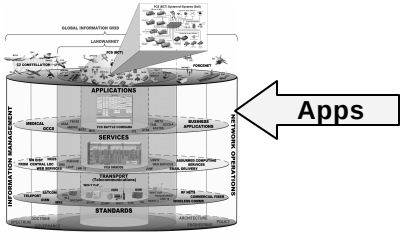
Multi-Function Radio Frequency (MFRF) system deployed on Ground platform

EOIR Sensor Deployed on SUGV

Electro-Optical Sensor deployed on CL IV UAV



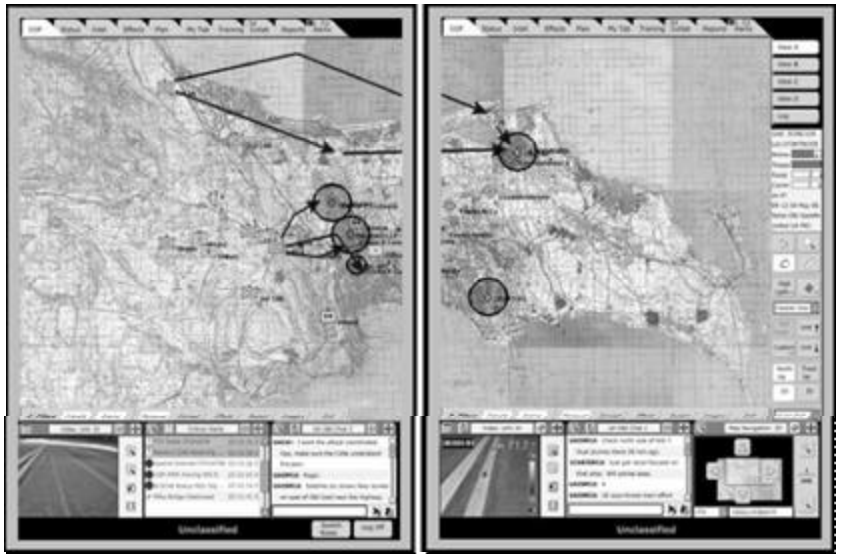
SAR/MTI radar deployed on CL IV UAV

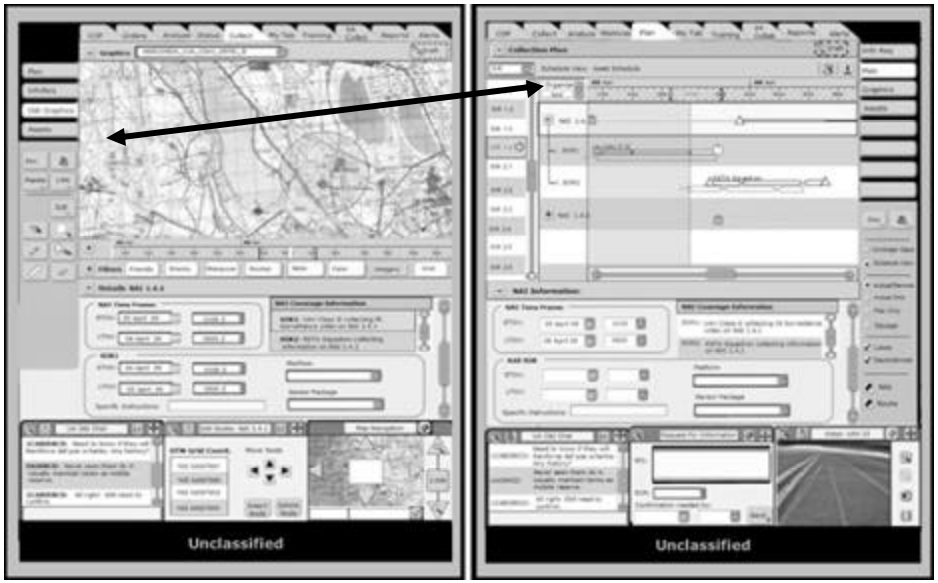


Battle Command Key Requirements

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

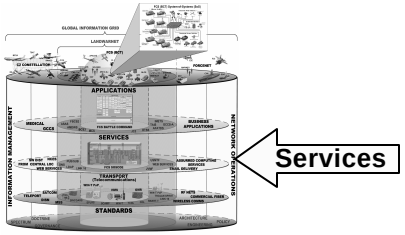
- Common Look and Feel Warfighter Machine Interface
- Full Control and Autonomy of Organic Sensors and Unmanned Systems
- Automated Deconfliction of Blue Forces, Air/Ground Space, and Fires/Munitions
- Automated Planning and Rehearsal Decision Making Process
- Collaboration Toolset (email, chat, and whiteboard, etc.)
- Multi-Levels of Fusion for Situation Refinement at the Platform
- Distributed Fusion Management





- Decision Aiding Supporting C2 of Multiple Unmanned Airborne, Unattended Sensor and Munitions, and Ground Systems by a WF
- Dynamic Sensor Planning, Tasking and Collection Visualization To Support CCIR
- Rapid Battlefield Damage Assessment Tied to Networked Fires
- Execution Monitoring and Dynamic Plan Adjustment Based on Changes in the Current Situation
- Real-time Assessment and Sharing of Combat Power

FCS Battle Command Provides the Warfighter with a Network Centric Automated Approach



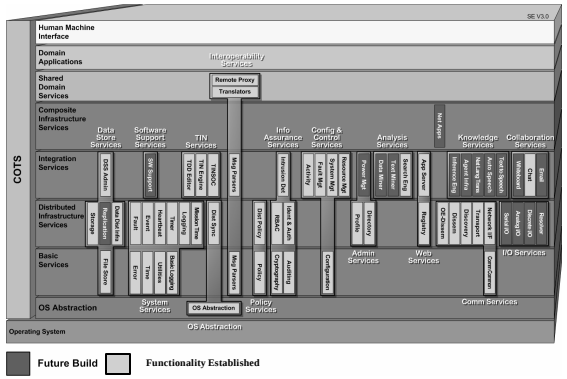
SOSCOE Key Requirements

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

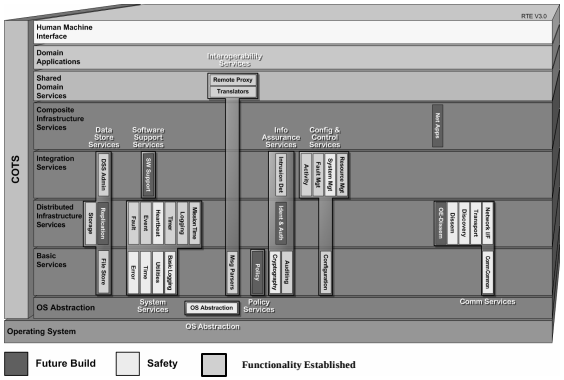
- SoSCOE Major Integration Capability Requirements
  - *Transparent* to the user
  - Common software components to integrate FCS Platforms and across FCS System of Systems
  - Enable net-centric integration within the tactical enclave (wireless, adhoc, dynamic network environment)
  - Work with self forming JTRS network transport to allow for “plug and play” battle command integration

- SOSCOE Feature Requirements
  - Isolate Battle Command Software from the Details of Interaction of the Ad Hoc, Bandwidth Constrained Network
  - Transform data and messages for Interoperability with Current, Future, and JIM Forces
  - Provides collaboration tools for Battle Command and NCES/GIG Interoperability
  - Build Information Assurance to include DoD PKI into the fabric of applications

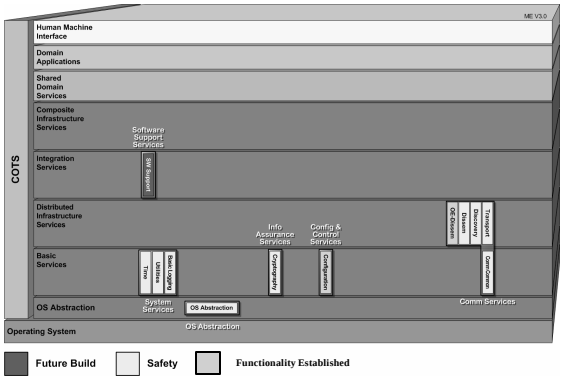
Standard Edition



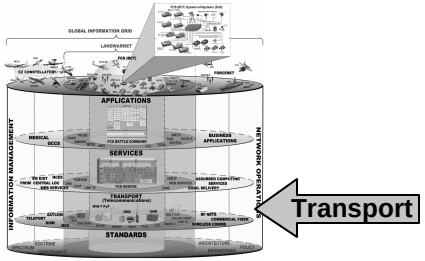
Real Time Edition



Micro Edition



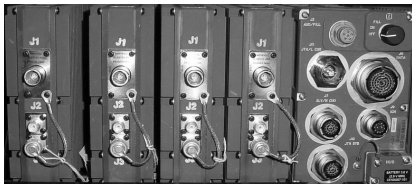
Multiple editions allow SOSCOE to meet performance, scalability, portability, composeability, and interoperability requirements



Transport Layer Key Requirements

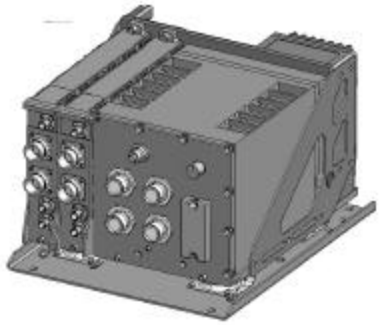
PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

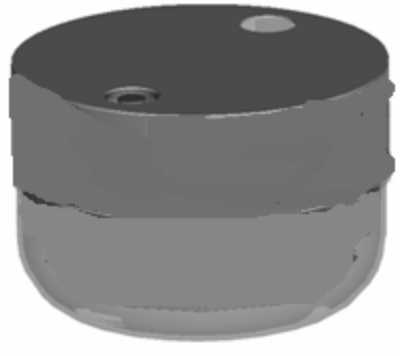
- Transport Technical Requirements
  - **Utilize JTRS and WIN-T**
  - **Provide secure communications**
  - **Connectivity over a 150kmx150km Area of Operations**
  - **Connect individual soldiers, manned ground vehicles, unmanned ground and air vehicles into the network**
  - **Operate in an ad-hoc, on the move environment**
  - **Connect the BCT to higher echelons and the GiG**



JTRS GMR

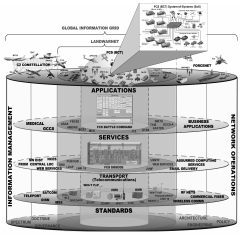
JTRS HMS





WIN-T JC4ISR

JTRS AMF



Cross Layer

Applying Lessons Learned Across All Layers

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

ISR

Applications

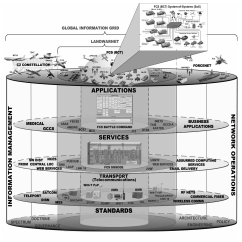
Services

Transport

Standards

- Counter IED Systems Integration
  - All FCS MGVs will have the Latest in Counter-IED (Jammer) Technology
- Customizable presentation of data through CPOF
  - FCS Warfighter machine interface extending the flexibility of the CPOF presentation for the commander
- Collaboration – a killer "app" from OIF
  - FCS will push capability further down in echelons (i.e. soldiers outside the command post)
  - SOSCOE services will help enable this capability
- Commander's OTM Transport
  - FCS will extend mobility to the individual platform across the Brigade
  - Also introducing high date rate at the quick halt capabilities to enhance performance across the full spectrum of operations

  Everything over IP (EoIP)
  - FCS will converge to a pure IP based architecture conforming to DoD standards

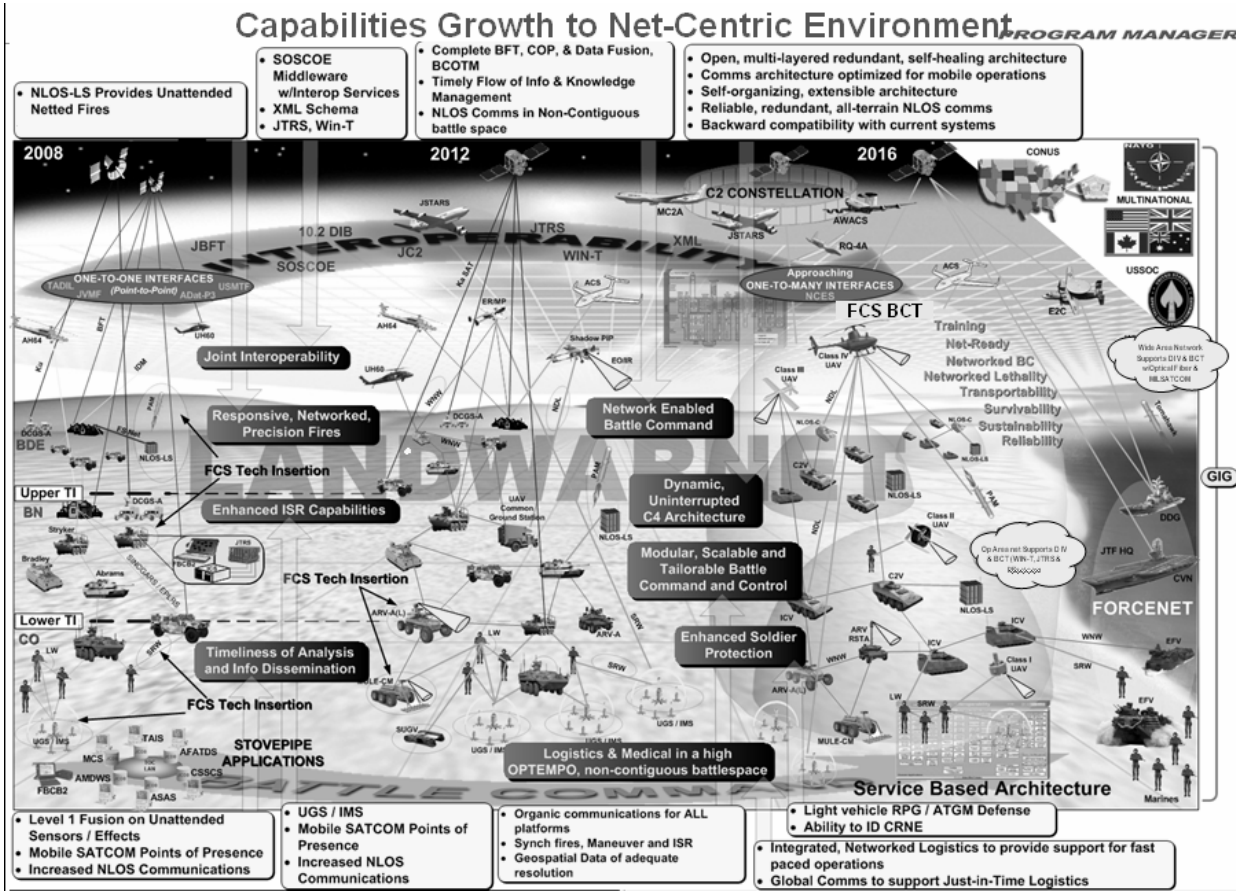


Cross Layer

Important "Take-Aways"

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

- **FCS will move the Army towards a Network-Centric environment that provides information on demand to:**
  - Warfighters
  - Decision Makers
  - Supporting Establishment
- **FCS is being developed as an integrated Network capability at all layers**
  - The network must be viewed as more than the "Transport"
- **FCS Spinouts will provide early introduction of technology to the Current Force**



FCS is building the future force while enhancing the current force

MANNED SYSTEMS INTEGRATION

COL Charles G. Coutteau

Project Manager
Future Combat Systems, Brigade Combat Team,
Manned Systems Integration
PM FCS (BCT) MSI
Warren, MI
586-574-8237

25 October 2006

MGV Platform Overview

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Mounted Combat System

- Provides LOS & BLOS offensive fire capability
- 120mm LW XM360 Cannon

Non Line of Sight – Mortar

- Close support of tactical maneuver
- 120mm breech-loaded mortar

Infantry Carrier Vehicle

- Carries 2 Common Crew + 9 member Infantry Squad
- Provides Infantry Direct Fires Support with Mk44 30mm and M240C 7.62mm Coax

Reconnaissance Surveillance Vehicle

- Primary manned scout platform
- 5m Masted sensor suite
- 2 Common Crew plus 4 Scouts with two Mission Workstations
- Mk44 Weapon System with M240C Secondary

MGVs Represent 322 Nodes on the FCS Network

MGV Platform Overview Cont'd

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Command & Control Vehicle

- Provides command & control to the FCS BCT
- Two-Man Crew and Four-Man Mission S
  Workstat

Medical Vehicle - Evacuation

- Evacuates up to 4 litters or 6 ambulatory casualties
- On board medical equipment and space for medics to perform En Route Care and advanced trauma

Medical Vehicle - Treatment

- Provides Advance Trauma Medicine and Advanced Trauma Life Support
- Full body access treatment table, quick erect shelter, blood refrigeration, 3D Ultrasound

Non Line of Sight – Cannon

- Provides mid-to- long range indirect fires support to the FCS BCT
- 155 mm Caliber 38 Cannon

FCS Recovery & Maintenance Vehicle

- Primary recovery and maintenance vehicle
- Up-righting, Winching and Towing
- Recovery of disabled vehicle crew

Common MGV Subsystems

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

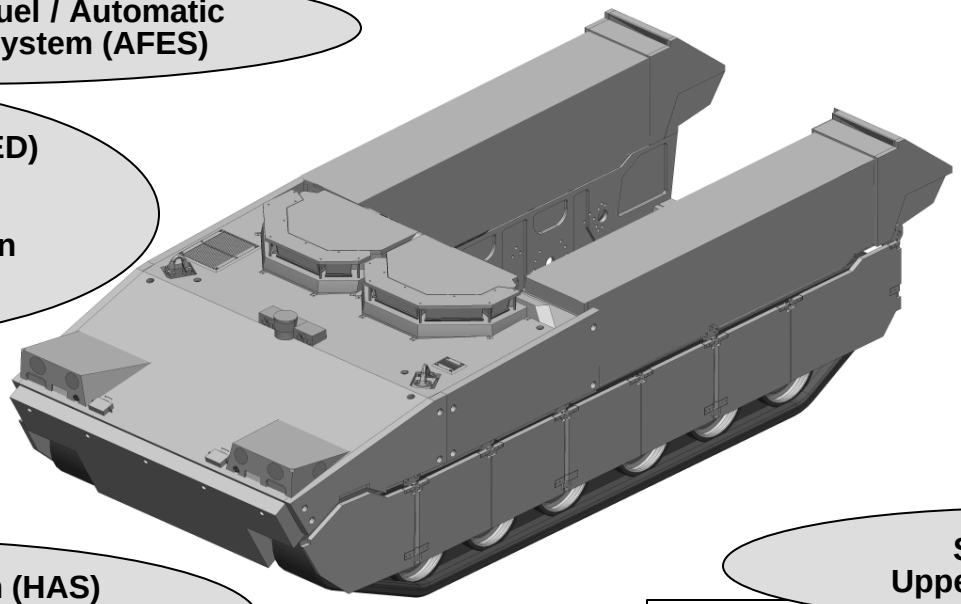
Nuclear Biological Chemical (NBC) / Environmental Control System (ECS)

Defensive Armament System (DAS)

Core Vetronics / Crew Stations

Auxiliary Systems-Fuel / Automatic Fire Extinguisher System (AFES)

Hybrid Electric Drive (HED)
Propulsion
Engine
Li Ion Batteries Traction
Drive System



Externally Mounted Close Combat Armament System

5L Common Engine

Hit Avoidance System (HAS)
Active Protection System (APS) / Countermeasures (CM)

Structures
Upper / Lower Hull

Suspension-
Hydro-pneumatic Suspension Unit (HSU)
Band Track

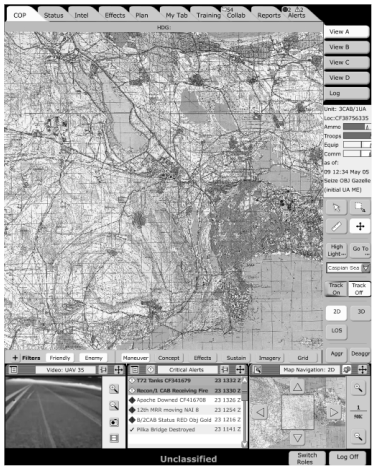
Armor-A + B

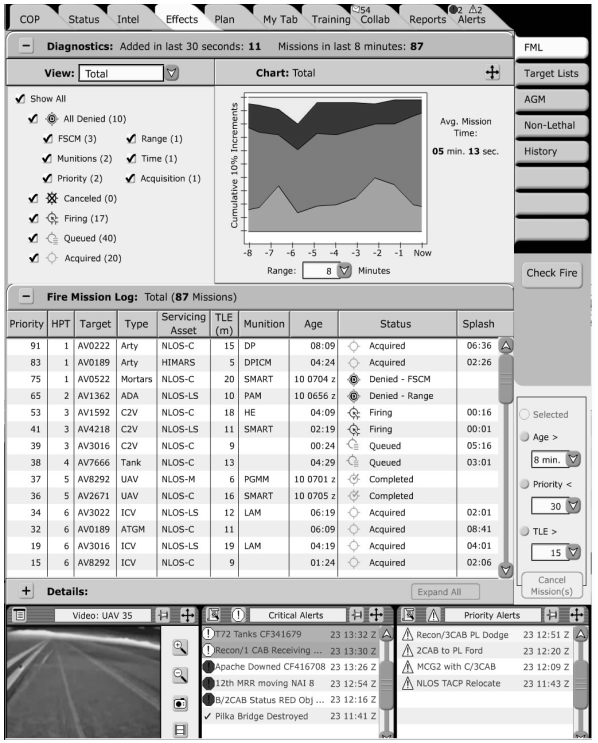
Platform Collected Data Shared by All *via the Network*

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

M1 Abrams Solder-Machine Interface

FCS Warfighter-Machine Interface (C2V Example)





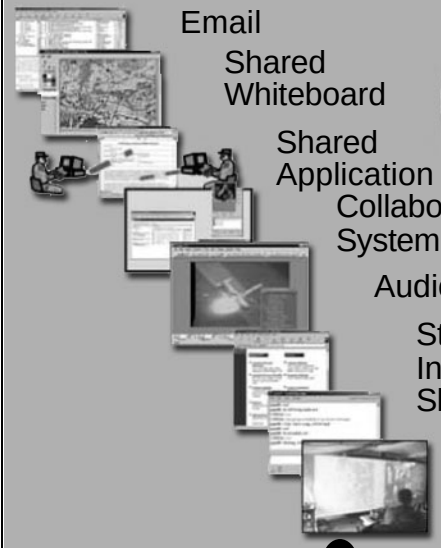
Current Force Platform Sensor Data is available to the Local Commander and Crew

FCS Sensor Data from all MGV (and other) platforms is available to the Entire BCT

Distributed Approach to Collaboration

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry

Joint Collaboration Services



- Email
- Shared Whiteboard
- Shared Application Collaboration System
- Audio and Video
- Streaming Information Sharing
- Web
- Instant Messaging

FCS BCT Collaboration

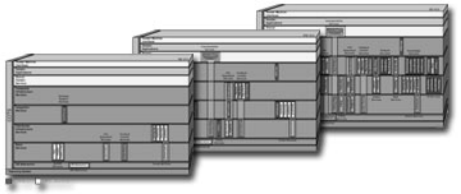
- Sharing of Planning Products
- Text-based Chat
- Presentation Sharing
- Whiteboard
- File Transfer
- Session Archival
- Map-based Collaboration
- Voice and Data Communication

Applications

- Warfighter Machine Interface to Chat, Email, and Whiteboard services
- Real-time Application Sharing
- File Transfer
- Session Archival
- Map-Based Collaboration

Services

- Chat, Email, Whiteboard services
- Infrastructure for collaboration in a mobile ad-hoc wireless environment
- FCS – NCES/GIG Interoperability



Transport

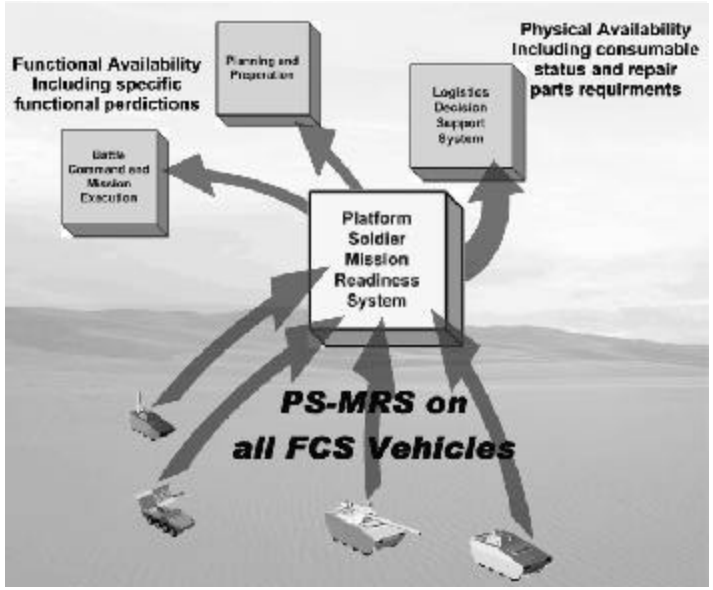
- Network Management
- Voice, Data, and Video

Platform Sustainment Enablers

- Networked sustainment enablers integrated into each MGV platform

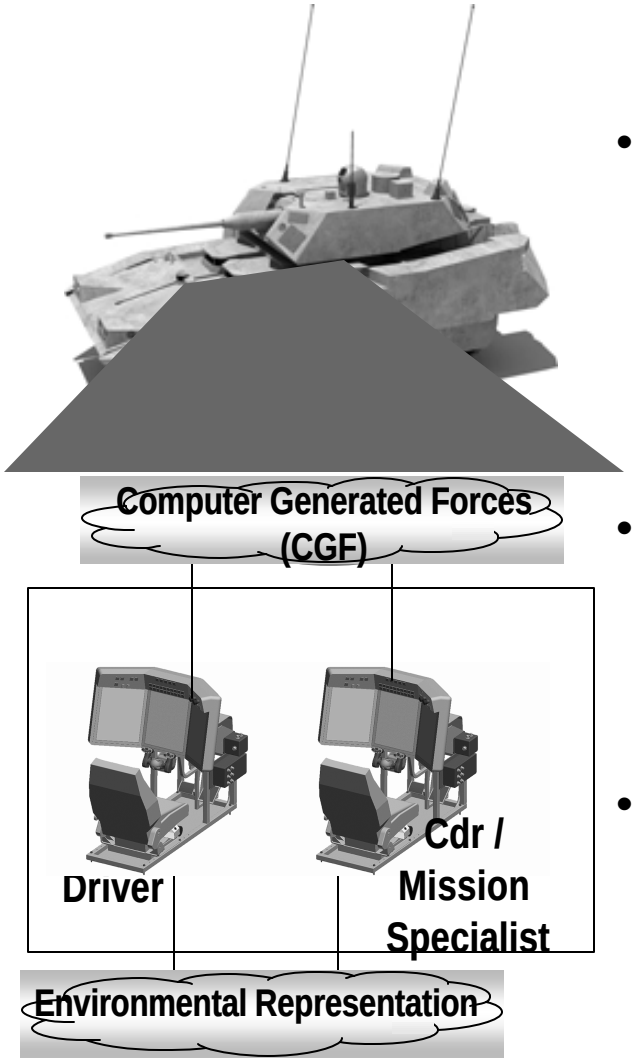
- Platform Soldier-Mission Readiness System (PS-MRS)
  - Integrate logistics into the network centric battlefield model: functional availability, physical availability, mission readiness
  - Enable 2 level maintenance concept

- Logistics Decision Support System (LDSS)
  - Logistics Planning and Management
  - Decision Support for Sustainment/Combat Replenishment Operations
  - In-Transit Visibility of Supplies
  - Enables Automated Resupply and Maintenance Planning



Embedded Platform-Level Supportability Functions

Platform Embedded Training

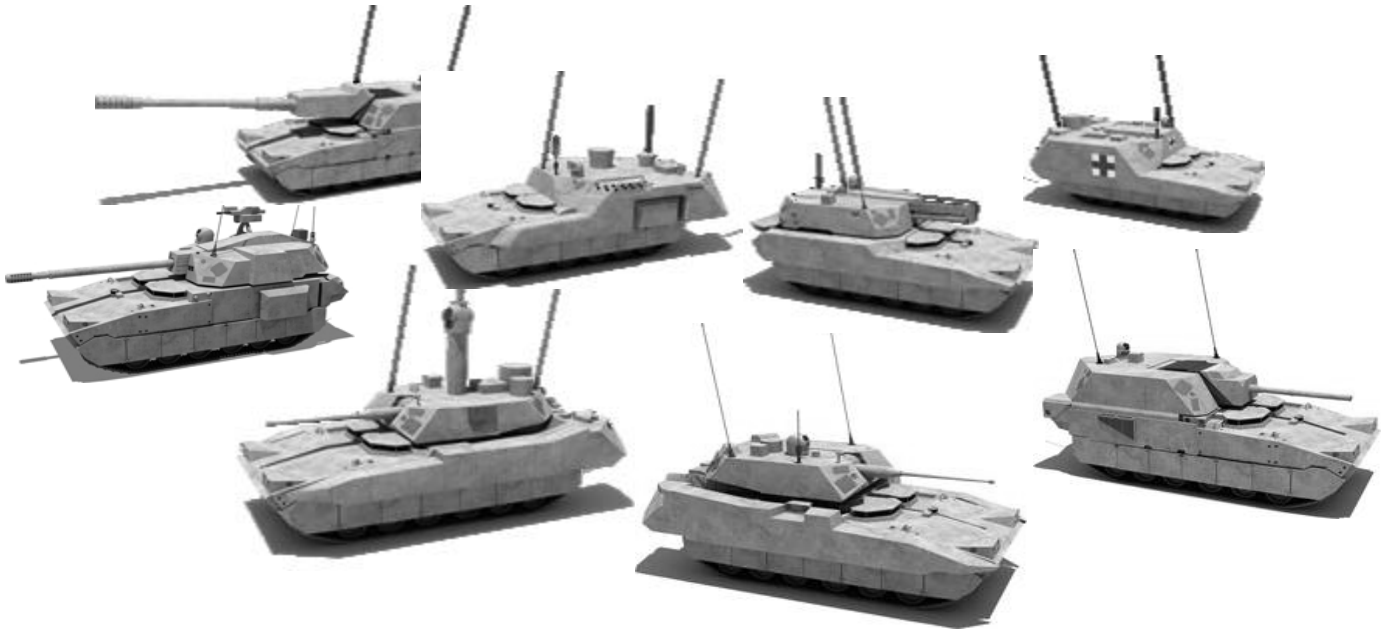


- MGV Platforms will embed training enablers
  - Training is a platform ‘mode” that is part of our architecture
  - Platform workstations and “network” access enable individual, crew, and distributed collective training
  - Support live, virtual and constructive training
  - Reach-back connectivity to “knowledge repositories”
- Training Support Packages
  - Level V interactive electronic technical manuals
  - Simulation-based training support packages
  - Interactive multimedia instruction
- Enablers include
  - Environmental representations (i.e. terrain, weather)
  - Computer generated forces provide external entities necessary to training tasks (i.e. targets, dismounted soldiers)
  - Transport layer components

Training Enablers Embedded on All MGV Platforms

Summary

- Each MGV platform is a node on the network
- Common Network architecture and components embedded in all FCS Manned Ground Vehicles
- Common look and feel Warfighter Machine Interface



SPIN OUTS

COL CHRIS DELUCA

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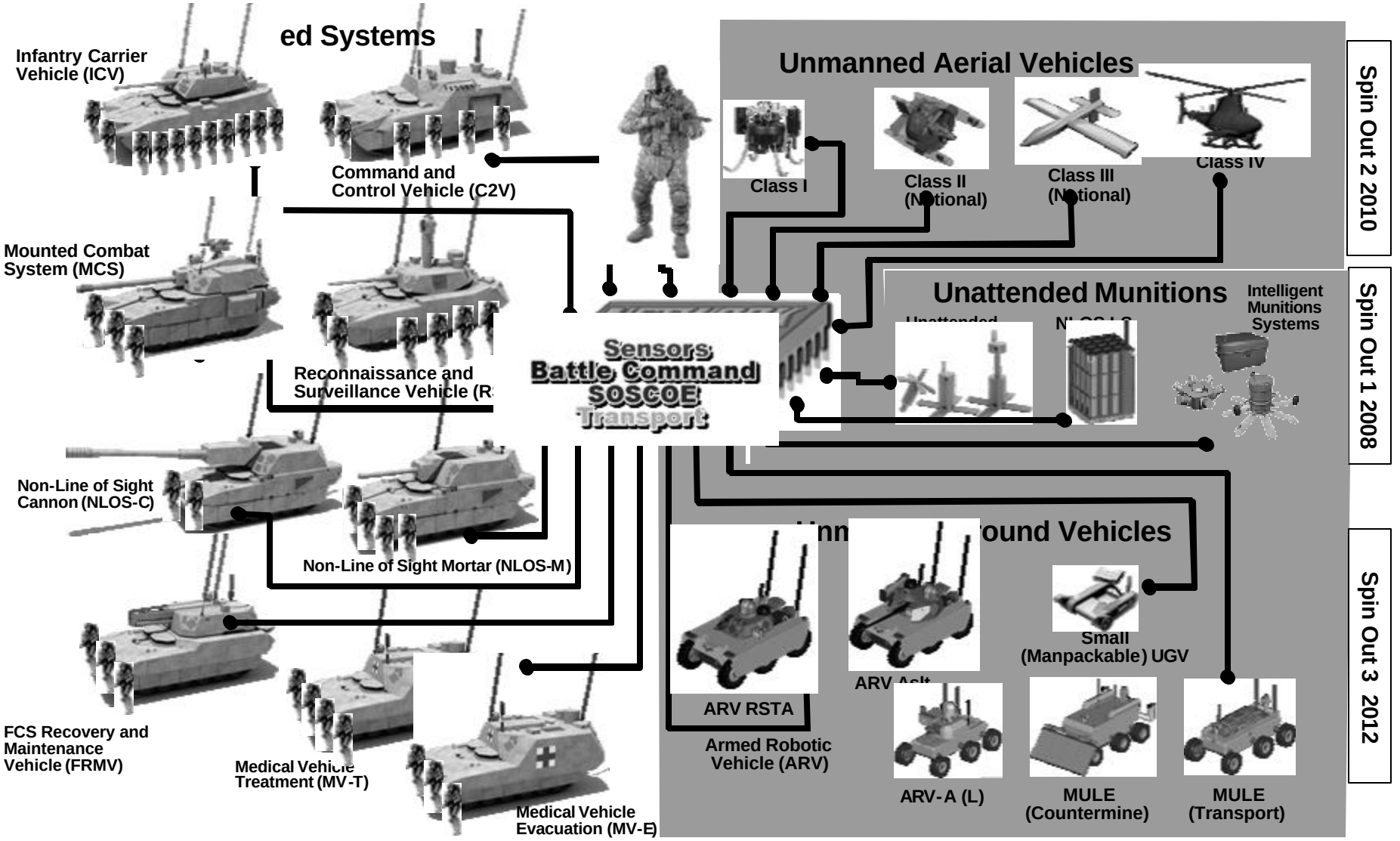
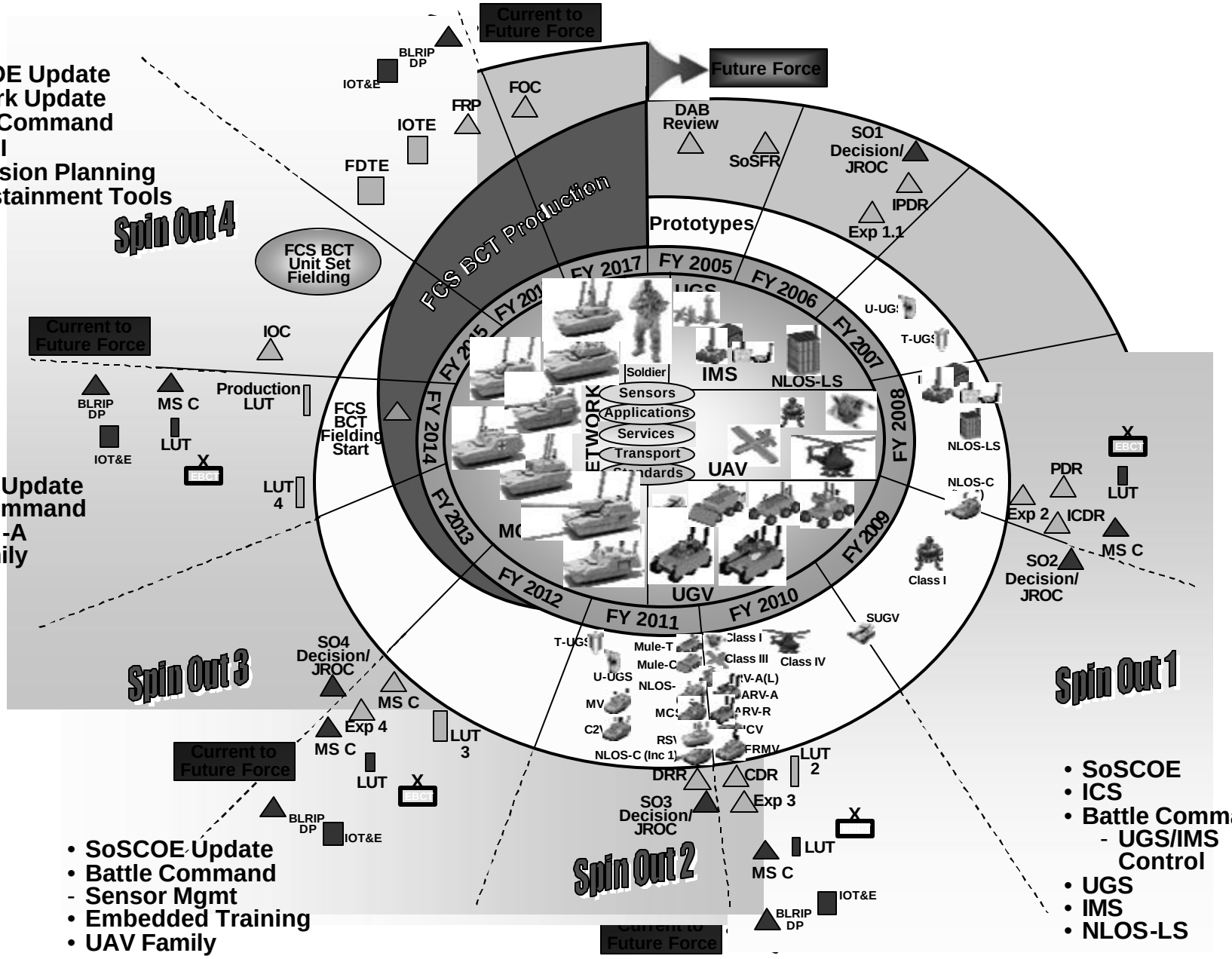
25 October 2006

FCS Brigade Combat Team...
18 Integrated Systems + 1 Network + 1 Soldier



Full Brigade Combat Team… 2014

FCS (BCT) System-of-Systems Schedule



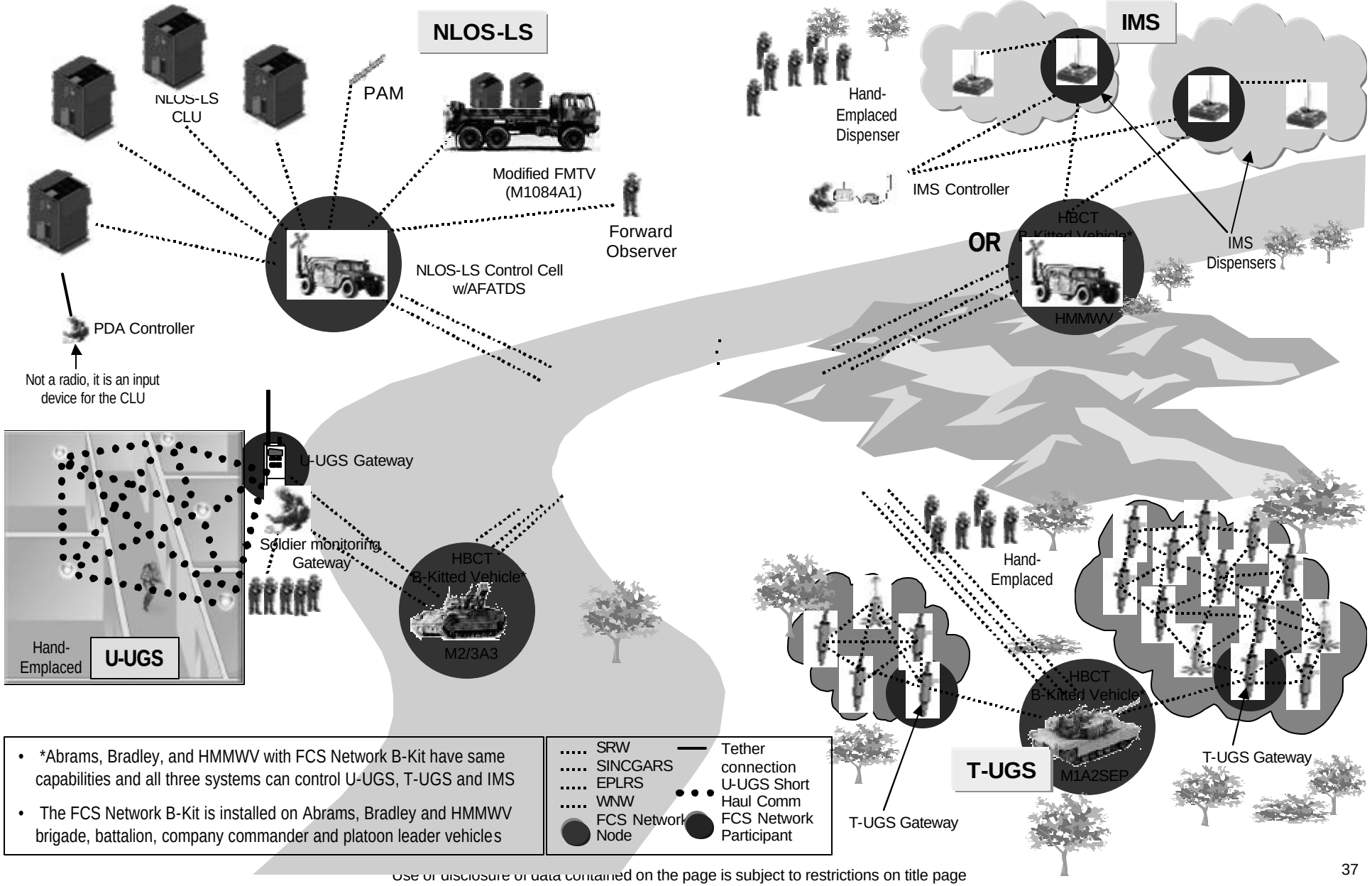
- SoSCOE Update
- Network Update
- Battle Command
  - WMI
  - Mission Planning
  - Sustainment Tools

- SoSCOE Update
- Battle Command
  - DCGS-A
- UGV Family

- SoSCOE Update
- Battle Command
- Sensor Mgmt
- Embedded Training
- UAV Family

- SoSCOE
- ICS
- Battle Command
  - UGS/IMS Control
- UGS
- IMS
- NLOS-LS

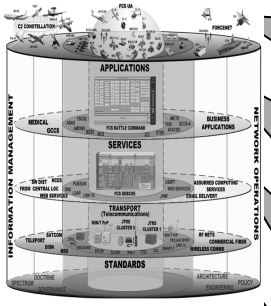
Spin Out 1 Operational Architecture



- *Abrams, Bradley, and HMMWV with FCS Network B-Kit have same capabilities and all three systems can control U-UGS, T-UGS and IMS
- The FCS Network B-Kit is installed on Abrams, Bradley and HMMWV brigade, battalion, company commander and platoon leader vehicles

SO1 LUT Network Layers: Building the Network Foundation

PROGRAM MANAGER FCS BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry



Operational Capabilities

- Enhanced tactical bandwidth
- Initial Network Lethality via NLOS LS and IMS
- Local Surveillance/Target Cueing via UGS
- Enhanced Red & Blue SA exchanged with FBCB2
- UGS/IMS C2 & Level 1 Sensor Data Fusion
- Initial Network Protection
- Initial Foundation for Networked Fires & SA Interoperability
- Improved Force Protection via IMS

Technical Capabilities


U-UGS


T-UGS


NLOS-LS


IMS

- B-kitted Vehicles: M2A3, M1A2 SEP, HMMWV

Platforms/Sensors

- FCS BC B1F with Basic Control for UGS, IMS
- FCS BC B1F with Basic Network Planning for UGS, IMS
- Integration and Fusion of UGS/IMS Data (L1F/BSO)
- NLOS-LS controlled via AFATDS


XWindows Display on FBCB2

Applications

- SOSCOE Build 1.8 (3 Editions, Real Time, Std. Edition, Micro)
  - Interop Services
  - Identification and Authentication, Event Logging, Basic Role Based Access Control
  - Services: 13 for Std. Edition, 7 for Real Time, 6 for Micro
- ABCS 6.4 Software Block 2

Services

- Pre – EDM GMR: EPLRS, SINCGARS (voice) SLICE 2.1, WNW 2.0
- Pre- EDM HMS SFF-H, EDM HMS SFF-A: SLICE 2.1(UHF)
- MSRT: SLICE 2.1 (UHF Band)
- SCRS: SLICE 2.1 (L-Band)
- Zigbee
- ICS Type VI


GMR


ICS

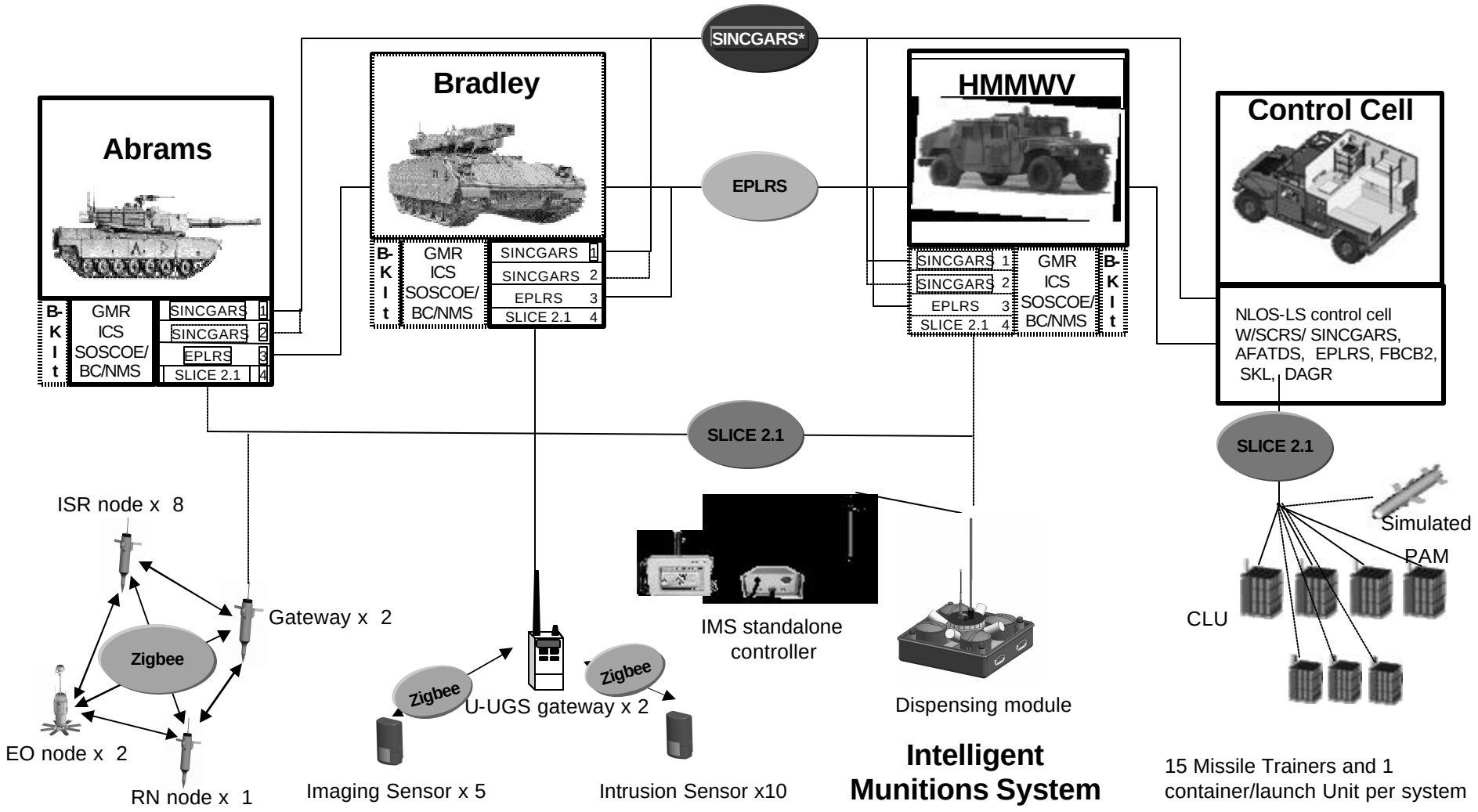
HMS

Transport

- VMF - Variable Message Format
- IPV4 - Internet Protocol version 4
- XML - Extensible Markup Language

Standards

Spin Out 1 Systems/Products for FY 08 Testing



Tactical-UGS

6 for Test/4 Spares

Urban-UGS

12 for Test/4 Spares

Intelligent Munitions System (IMS)

7 for Test/3 Spares

15 Missile Trainers and 1 container/launch Unit per system

Non Line Of Sight – Launch System (NLOS-LS)

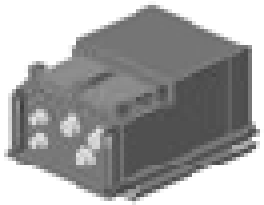
6 for Test/1 Spares

Spin Out 1 Systems and Capabilities

JTRS GMR

JTRS GMR Radio Hosting FCS Software (SINCGARS/EPLRS/SRW/WNW)

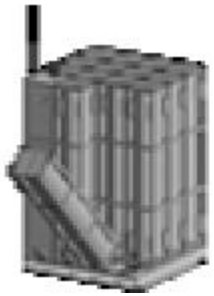
- **RF amplifiers and antennas for CF vehicles incl. co-site mitigation for FCS network components**
- **Interoperate in Current Force EPLRS and SINCGARS network**
- **Manage Red/Black side of JTRS (SRW, WNW)**



ICS Type 6

Integrated Computer System (ICS) – Type VI

- **Networked thru JTRS CL1**
- **EPLRS Form Factor w/integrated platform LAN router**
- **Remote & local zeroization of stored data**
- **Provide firewall between future network and current network**
- **Leverages Existing FBCB2 monitor for display of FCS BC Applications (IMS and UGS Control)**
- **Software:**
  - **SOSCOE v1.8**
    - **Level 1 interoperability services to: FBCB2 & AFATDS**
  - **Battle Command Software**
    - **SDM, L1F & C2 for U-UGS, T-UGS & IMS**
    - **SOSCOE interoperability services send Fused Sensor data to FBCB2 application for Situational Understanding/COP Display**
    - **Network Management System - Manage FCS computer/network**
    - **Partial identification of Battle Space Objects**
    - **Controls IMS arming, disarming & exchange of control with IMS controller**



NLOS-LS

NLOS-LS

- **CLU and PAMs**
- **Transported on FMTV**
- **JTRS HMS**
- **Ground launched or fired from FMTV**
- **Managed/networked via AFATDS between FDC & NLOS-LS CLU**
- **Secondary control via PDA**
- **Software Description: SOSCOE 1.8**

Spin Out 1 Systems and Capabilities

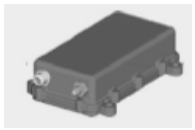
IMS w/JTRS HMS
- **Hand emplacement of dispenser**
- **Dismounted control of IMS in addition to platform control of IMS**
- **Anti-personnel & anti-vehicle lethality**
- **Operate in an unattended, unclassified environment for 30 days**
- **IMS Components have capability to self map, self destruct/deactivate**

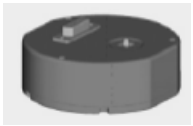
U-UGS

U-UGS
- **Hand emplaced**
- **Intrusion Detection and Imaging Nodes**
- **Tamper detection**
- **Software:**
  - **Gateways include SOSCOE Micro Edition**

T-UGS

T-UGS
- **Hand emplaced**
- **Acoustic/Magnetic/Seismic sensing, EO Sensor, Radiation/Nuclear sensing**
- **Tamper detection**
- **Software:**
  - **Gateways include SOSCOE Micro Edition**

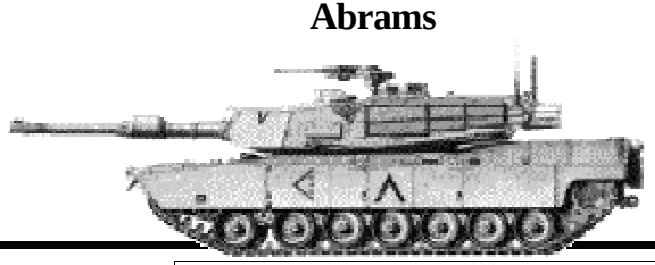


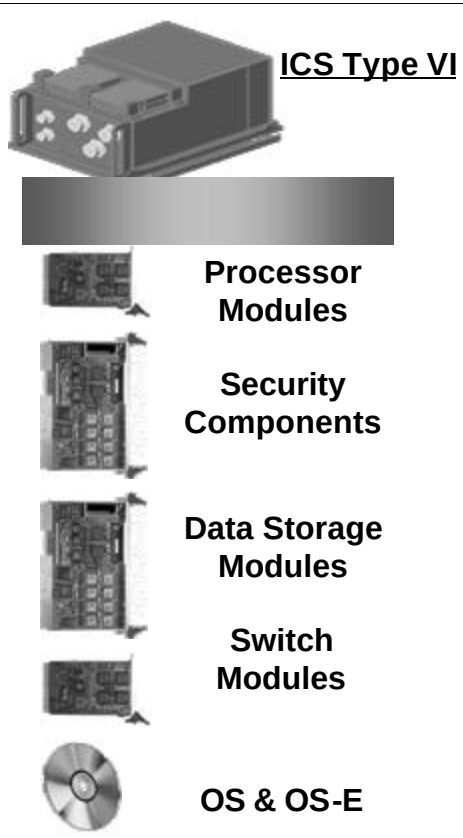


JTRS HMS

JTRS HMS
- **Various Small Form Fit (SFF) configurations**
- **Using Soldier Radio Waveform (SRW) as the primary transport waveform**
- **Effort on-going to accelerate hardware deliveries to support SO-1 for UGS, IMS and NLOS-LS**
- **Gateway to GMR radios at the vehicular platforms**

Current Force Platform Integration

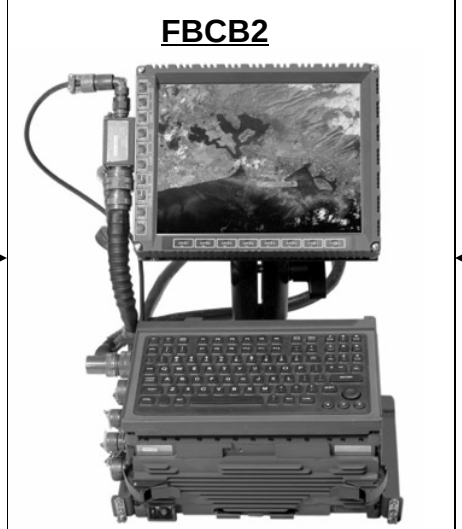




Control IMS/UGS

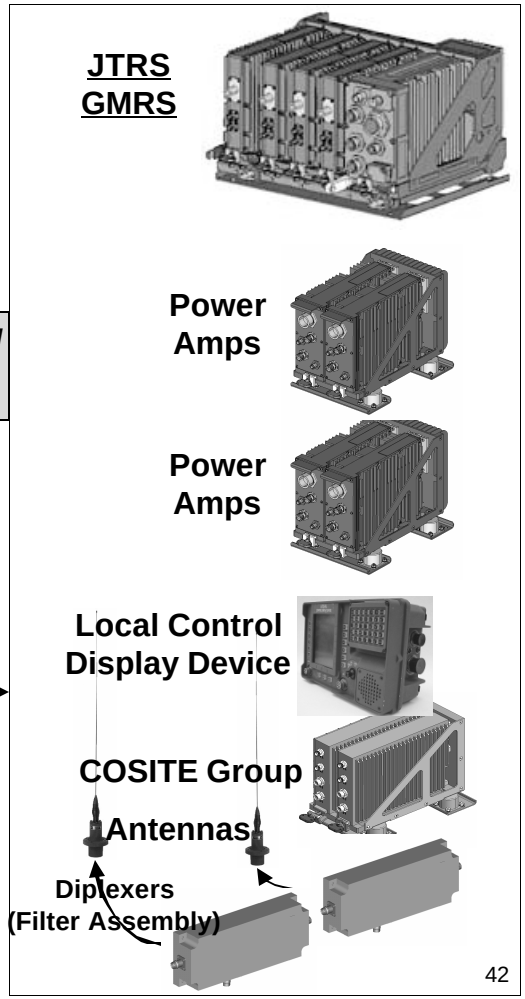
ABCS Interoperability

EPLRS/ SINCGARS/ WNW/SRW



Leveraging FBCB2 Keyboard & Display

Interface to the Tactical Internet



We Look Forward to Your Questions

25 October 2006