International Infantry & Joint Services Small Arms Systems Annual Symposium

Linking Mortars to the Joint Fires Network

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APM Fire Control

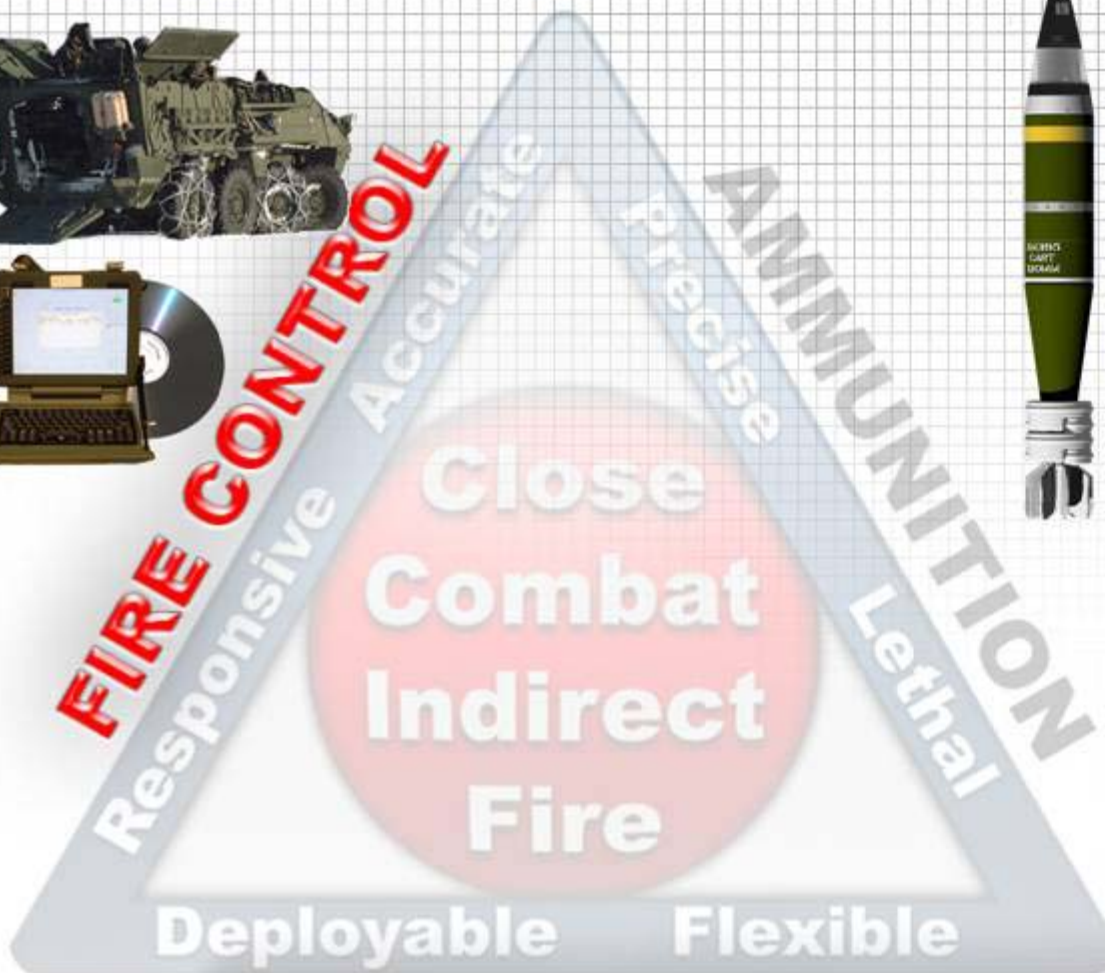**Office of the Product Manager for Mortar Systems**

Agenda

- **Current Capability:**
  - Mortar Fire Control System (MFCS) Heavy
    - Current Tracked and Wheeled Mortar Carriers
- **Future Requirements**
  - Lighter systems for dismounted mortar weapons
  - Improved Capabilities
- **Software Blocking**

FIRE CONTROL

Responsive Accurate Precise

AMMUNITION

Lethal

Close
Combat
Indirect
Fire

Deployable   Flexible

WEAPONS / PLATFORMS

Mortar Fire Control System (Heavy)

- Links Mortar Fire Control System to the digital battle field

- Improves disbursement of mortars while providing Command & Control to mass lethal effects

User Payoff:

- Responsiveness: 8 versus 1.5 minute for fire for effect
- Accuracy: Improves (CEP) from 230 meters to 70 meters (less in Stryker)
- Survivability: Eliminates soldier dismount
- Command & Control: Interfaces with Digital Fire Support and Situational Awareness

Qualification Program Successfully Completed, Fielding now Underway

Dismounted Mortar Fire Control

System Description

- A *modular* digitized Fire Control System suitable for a *variety of current and future dismounted mortar* weapon applications
  - *Ballistic Solutions* for all Mortars, all Missions
  - *Command and control interface* to AFATDS / FOs
  - *Weapon Location and Pointing*

Acquisition Strategy

- *Incremental Development*
- *Leveraged Development*

User Payoff

- <1 Minute to Emplace Day/Night
- <30 Sec First Shot when Emplaced
- Increases effectiveness and survivability
  - Shoot and scoot
  - Dispersed operations
- Self laying weapon (Eliminating Aim Posts/Sight)
- Increased system accuracy
- Linked to digital battlefield
- Sensor to Shooter capability
- *Low Cost / Modular Fire Control*

Increment I - Light Weight Hand Held Mortar Ballistic Computer (LHMBC)

- **Ballistic Solutions** for all Mortars, all Missions
- **Digital Communications** with the Fire Support Network (AFATDS - FDC)
- **GPS** - Weapon Position Location Data

Increment II - Mortar Fire Control System – Light (MFCS-L)

- *Ballistic Solutions for all Mortars, all Missions*
- *Complete Digital Linkage with the Fire Support Network (AFATDS - FDC - **Guns**)*
- *GPS Weapon Location*
- **Weapon Pointing (Indirect)**
- **Direct Lay Day / Night Engagement**

Incremental Development

- *Ballistic Calculations*
- *Weapon Position (GPS)*
- *Digital Communication*
  - *AFATDS - FDC*
  - *AFATDS/FDC – Guns*
- *Weapon pointing and aiming*

Inc I LHMBC

Inc II MFCS-L

Requirement Documents
Inc I - MFCS ORD 1994 (LHMBC UFD 2003)
USMC MBC ORD 2002
Inc II - FCS ORD 2004

MFCS-L Objective

LHMBC

Weapon

FDC

Gunners Display

Light Weapon Pointing Device

Direct Lay Day / Night Sight

Squad Leader Computer

MFCS Interoperability

Joint Systems

US Air Force
- Tactical Air Control Party
- Theatre Battle Management Core System

US Marine Corps
- AFATDS
- Tactical Air Control Parties-M
- Data Automated Communications Terminal
- Intelligence Analysis System
- Tactical Command/Operations
- Target Location, Designation, and Hand-Off System
- Forward Observer System

US Navy
- Global Command and Control System – Maritime
- Naval Fires Control System
- Tactical Exploitation System

Battle Command Systems

MCS
FBCB2
GCCS-A
BCS3
AMDWS
DTSS
ASAS-Light
TAIS
AFATDS

Allied Systems
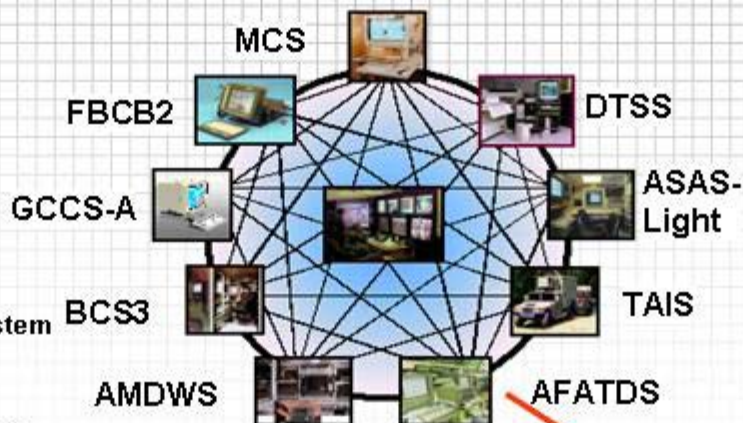
ATLAS (FR)
ADLER (FRG)
BATES (UK)
SIR (IT)

MFCS is a core system in Army Software Blocking

MFCS-H

PGMM

LHMBC

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MFCS Digital Links

BN FSE
(AFATDS)

FIST HQ
(FOS)

FBCB2

FO
(FOS)

Sensor to Shooter
Capability

Tactical Internet

Tactical Internet

Maneuver

Battalion Mortar Platoon
MFCS

M1A2, M1A1, Bradley

MFCS

FBCB2

FDC

Gun

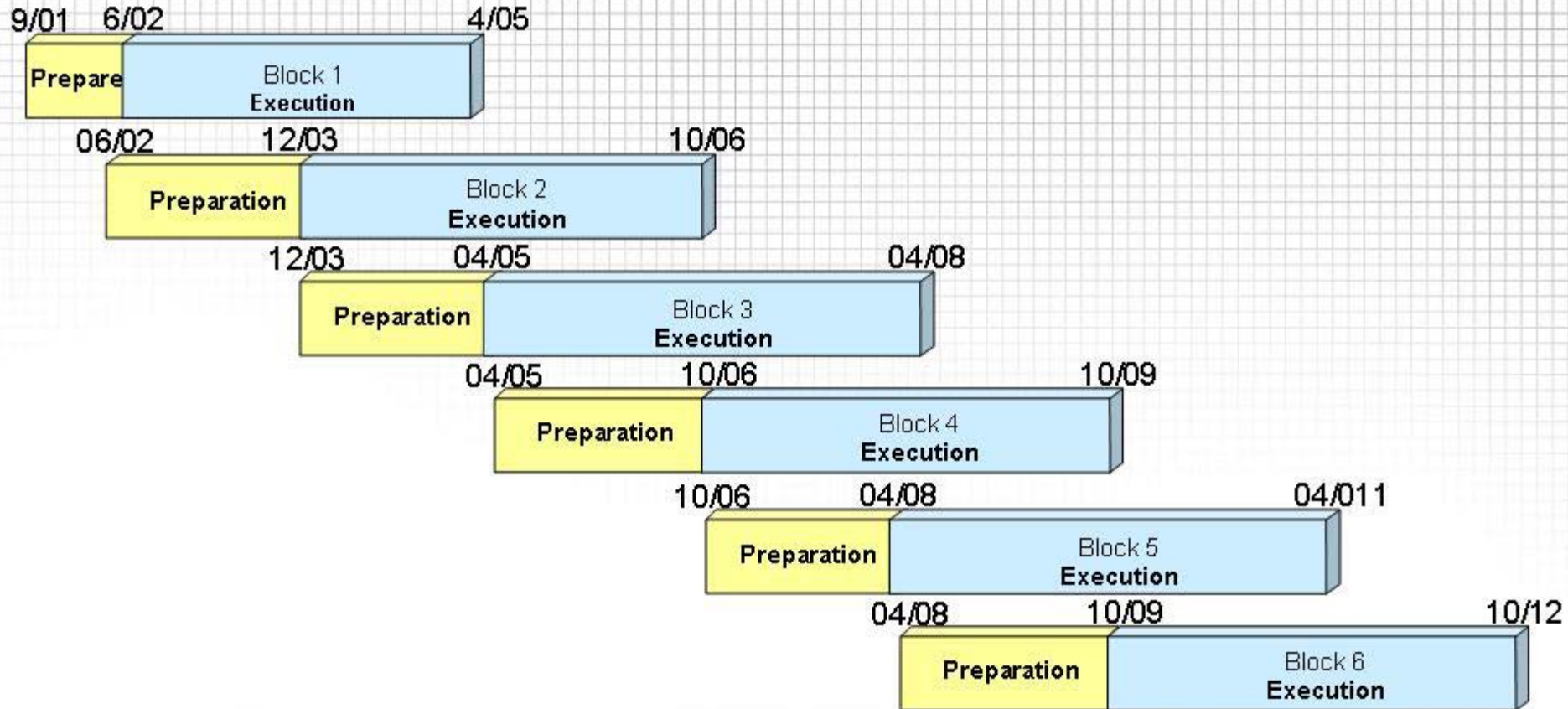PMMortars

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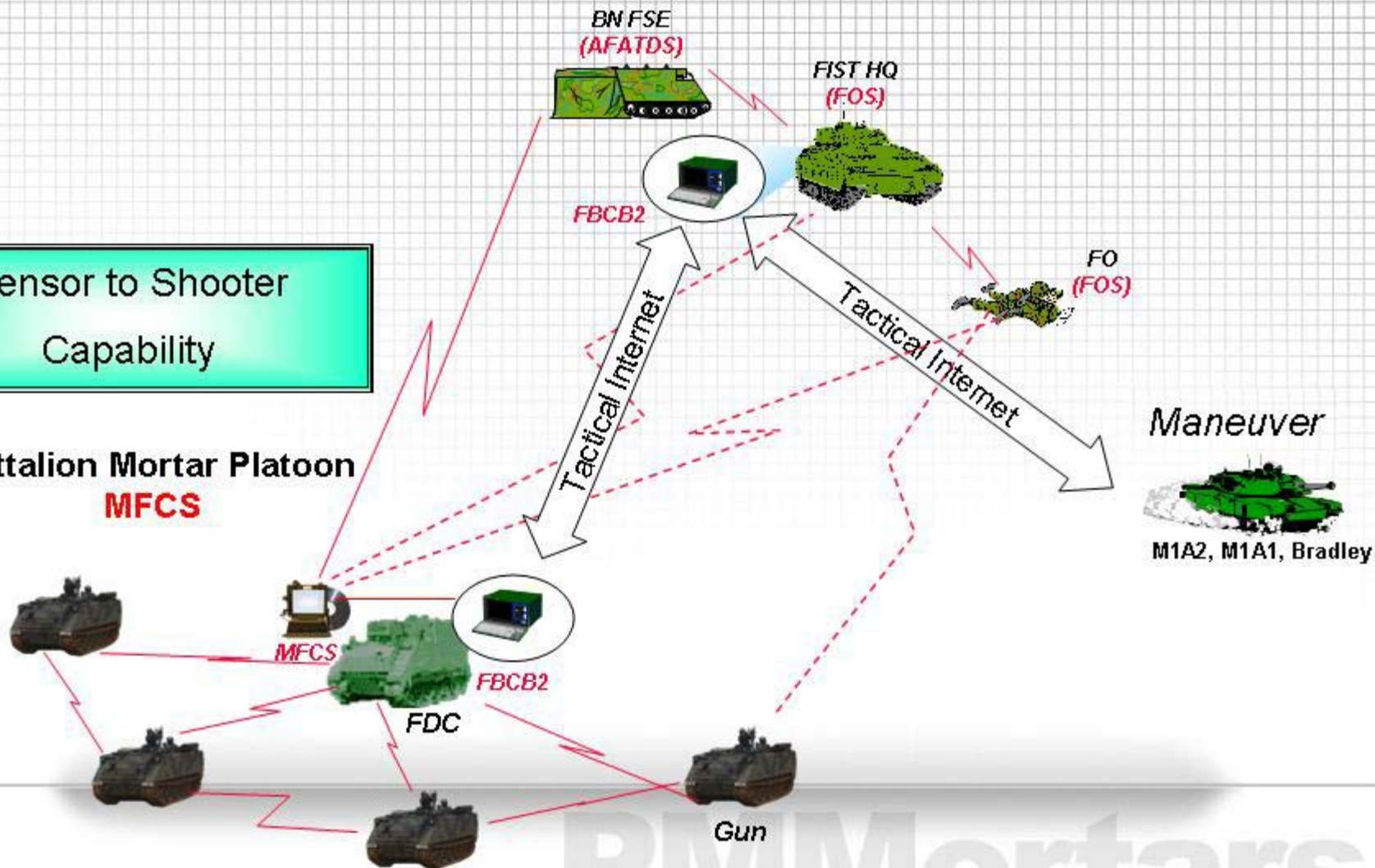
Software Blocking Definition/Scope

- ## Definition

  - Balanced and disciplined policy/process for harmonizing requirements

  - Expedite the rapid delivery of innovative, integrated, and operationally suitable warfighter capability.

- ## Scope

  - All new and upgraded systems that exchange digital information on the battlefield

Software Blocking is the framework for achieving Interoperability

Software Blocking: Planning Schedule

9/01 6/02   4/05

Prepare | Block 1 Execution

06/02   12/03   10/06

Preparation | Block 2 Execution

12/03   04/05   04/08

Preparation | Block 3 Execution

04/05   10/06   10/09

Preparation | Block 4 Execution

10/06   04/08   04/011

Preparation | Block 5 Execution

04/08   10/09   10/12

Preparation | Block 6 Execution

Software Blocking is a continuous process

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Core Systems (23)		Enabling Systems (12)	Interfacing Systems (19)	
ASAS Light/RWS	**MFCS(M95)**	ACUS Mod	AMPS(JMPS)	Stryker
MCS(w/JWARN)	ECTA	BSN	MLRS FDS	CH-47F(IDM)
FOS(LFED/PFED/FSTU)		EPLRS-RS/NCS/ENM	DBST	CCTT XXI
FBCB2	IMETS	SINCGARS(ASIP/Airborne)	A3 BFIST	M270 (LRAV)
GCCS–A	TOC Server	TOC Infrastructure	HIMARS	IFSAS
M1A2SEP	OH-58D(IDM)	HF Gateway	M270A1 (MLRS)	BCS
M2A3 (IFV)/M3A3	AFATDS	VTT/PTT/MTT	CTIA(DMPRC/FTI)	MMS
AH-64D(IDM)	Paladin	TCIM	Land Warrior*	MTS
TAIS	AMDPCS	IDM	Patriot*	FF Q37
TUAV	FOX(MICAD)	INC		FF 36/EU
ISYSCON(TIMS)	DTSS	MDL	*System included for programmatic	
C3 Driver	CSSCS	A2C2S	Integration purposes only; will not require certification	

Core System: A system that provides the critical overall operational capability being incorporated in Block 1; will require certification and operational Evaluation participation.

Enabler: A system that is key to supporting interoperability of core systems but may not require certification or operational evaluation. If a system requires certification it will be done as part of Software Blocking.

Interfacing System: A system that provides a significant capability and is required to undergo certification but not operational evaluation as a part of Block 1.

Interoperability Challenges

- Coordinating Block Fielding between systems
- Compatibility with legacy systems
- Collective Training
- Increased security vulnerabilities