Constructing Common Fire Control Across Weapon Platforms

Presented by

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Outline

- ***Common Fire Control***
- ***Programmatic Considerations***
- ***Software Considerations***
- ***Hardware Considerations***
- ***Conclusions***

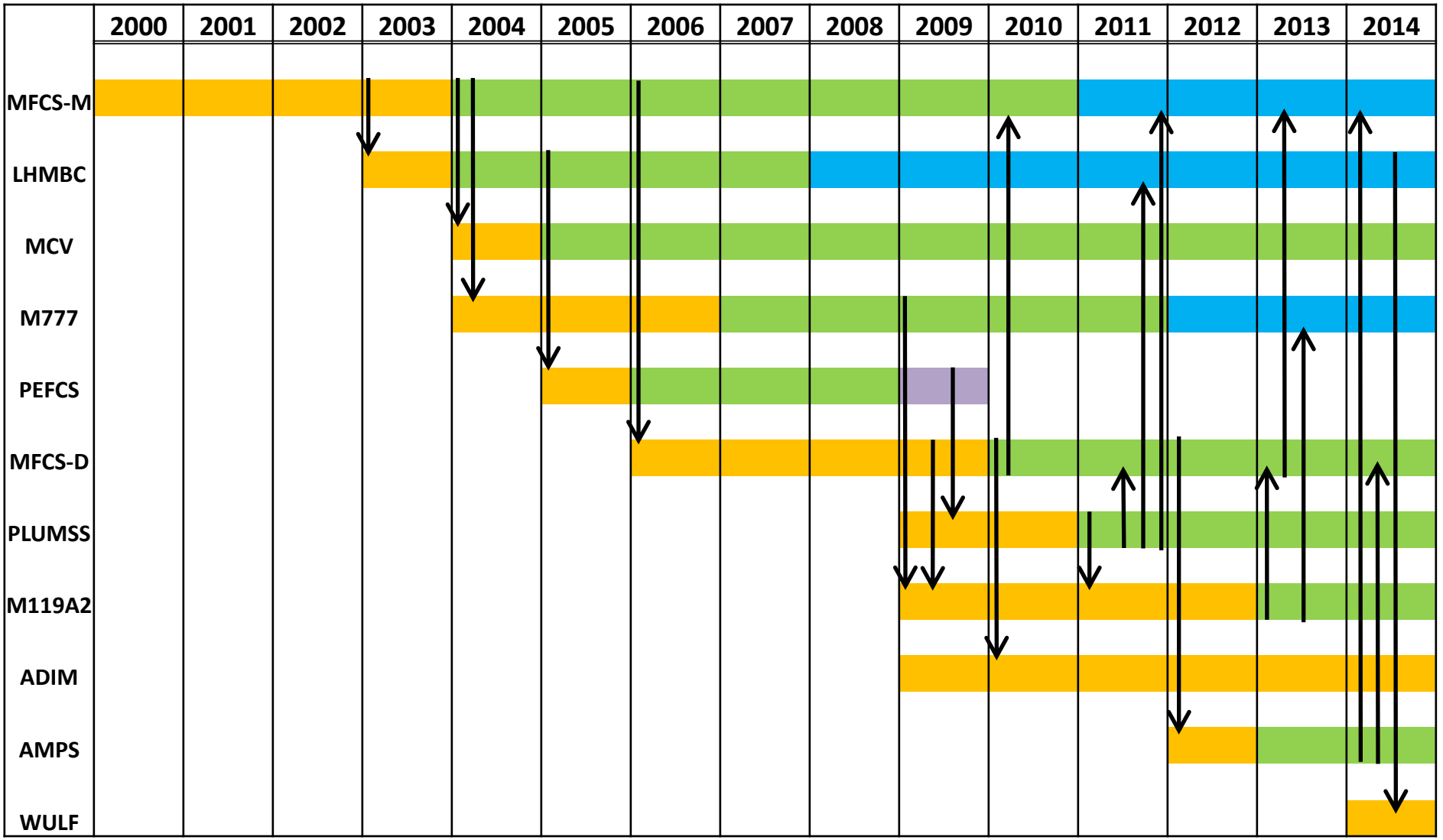
Common Fire Control

- ***Decrease Testing***
- ***Decrease Cost***
- ***Decrease Development Time***
- ***Increase Reliability***
- ***Increase Supportability***
- ***Increase Interoperability***
- ***Reduce Training***

Current State

- ***Current Common Fire Control consists of reuse of developed components and software.***
  - ***Once a new system is developed it is treated as a stand-alone system.***

Current State of Reuse



Current State SW Reuse

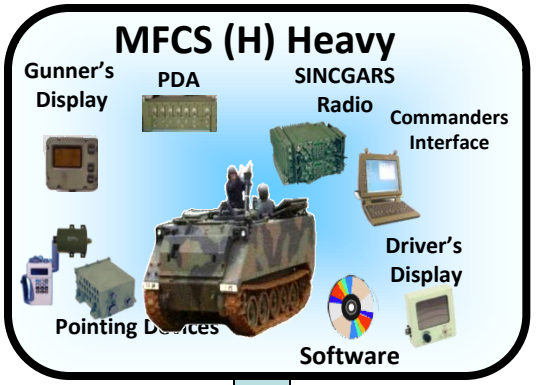
US ARMY RDECOM

MFCS Software & Hardware

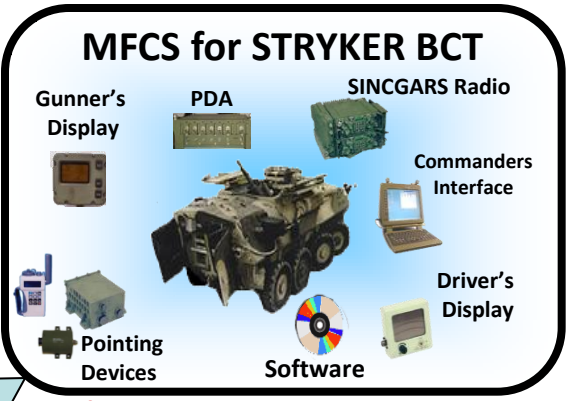
D120 MFCS

$9.59M/36mo avoided

MFCS (H) Heavy

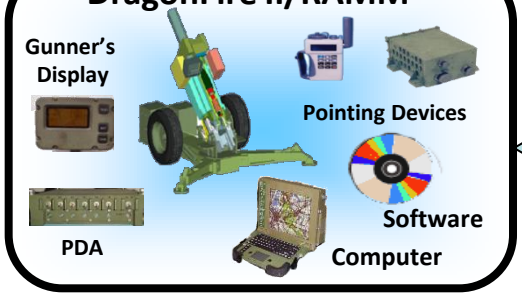


MFCS for STRYKER BCT



$6M/35 mo avoided

DragonFire II/RAMM



$5.5M/36 mo avoided

ONR/USMC Effort EFSS Demo

$5.67M/30 mo avoided

Portable Excalibur Fire Control System

$2.2 M/12 mo avoided

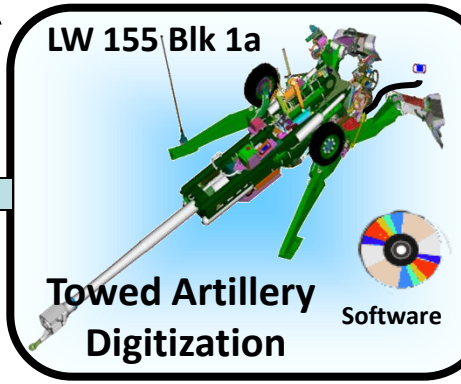
Lightweight Handheld Mortar Ballistic Computer

$2.4M/18 mo avoided

M119 Howitzer

$6M/31 mo avoided

LW 155 Blk 1a



$2.4M/36 mo avoided

NOTE: Software Development Costs Only

Programmatic Considerations

- ***Multiple Requirements***
  - ***Requirement Overlap***
  - ***Common CPD / KPP***
- ***Government Owned vs Contractor Based***
- ***Initial Cost***
  - ***Modular Approach***

- ***Multiple PMs*** ***(with Unique Program-of-Record Timelines)***
- ***Multiple School Houses***
- ***Services*** ***(Army, USMC, Navy, Air Force)***

Software Considerations

- ***Common Backend Architecture***
- ***Trunk Based***
- ***Modular Components***
  - ***Meteorological Data (MET)***
  - ***Fire Support Coordination Measures (FSCM)***
  - ***Peripheral Interface (PI)***
  - ***Comm-Network***
  - ***Geodetic Translation (GeoTrans)***
  - ***Mapping***
- ***User Interface / Soldier Machine Interface (UI/SMI)***

Software Considerations (cont)

- ***Platform Considerations***
  - ***Adaptable Source Code***
  - ***Modular Operating Environment (Net Warrior)***
  - ***Cloud based consideration***
  - ***Legacy***

Hardware Considerations

- ***ICD Control - Predefined software to hardware ICD***
  - ***In order to support multiple hardware components in a modular and universal environment a common software ICD is required.***
- ***ICD Interpreter Components – ICD translators***
  - ***ICD Interpreters will need to be constructed to adapt the common ICD to the specific hardware communication standard. These interpreters would be designed into a cable backshell and reside between the system cabling and the hardware line replaceable unit.***

Hardware Considerations (cont)

- ***Flexible / Modular Hardware***
  - ***Modular based computer***
    - ***Computer system would be brought down to the lowest common denominator***
    - ***Handheld computer with docking station connectivity would allow one computer to work in multiple environments***
  - ***Cabling standards***
    - ***Cabling will have to be standardized to a point where the ICD Interpreters could adapt signal and power to meet requirements***
    - ***Ethernet from computer through cables could be easily modified by interpreters to old interfaces (RS232, RS485)***
    - ***Power could be run at 24V and lowered at interpreters.***

Conclusions

- ***Cost viability needs to be fully understood***
  - ***Long-term Army-wide savings, but heavy initial cost for PM/PEO***
- ***Current path allows for utilization through attrition***

Questions

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Abstract

Constructing Common Fire Control across Weapon Platforms

Briefing Type: Oral Presentation/Presentation Charts

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Abstract:

- Today's modern artillery and mortar weapon systems heavily utilize digital Fire Control Systems. These systems increase the lethality and survivability of artillery and mortar systems. Across weapon platforms each has emerged with a slightly different fire control system, but they all have many overlapping features and requirements. This overlap provides the potential to develop a common fire control system that could serve as a base for future system development for a broad application. This paper will address three key points and challenges in creating a common fire control system, Software Design, Hardware Considerations and System Architecture. Such an approach would produce significant cost and time savings if programmatic challenges can be overcome. The paper will describe the current state of common fire control in each of these areas, outline the next steps that must be taken, and describe the associated technical and programmatic challenges. Ultimately, the paper will present a clear path from the current state of the art to the future of common fire control across multiple weapon platforms.

References

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•“Establishing Modular Common Fire Control in a Fiscally Constrained Environment” *R. Tillinghast (40%), M. Wright (40%) & R. Arnold (20%), Proceedings: National Fire Control Symposium, 2015 [Paper]*