Precision Fires
Rocket and Missile Systems

Recipients of the 2008 William J. Perry Award
Recipients of the 2009 Secretary of Defense Performance-Based Logistics Award

Always On Target!
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Precision Fires Rocket and Missile Systems

Mission
To Develop, Field, and Sustain the Field Artillery’s Fleet of long range ground-to-ground Rocket and Missile Launchers and precision Munitions for the U.S. Army, Joint and Coalition Warfighters that provide a decisive Battlefield Advantage

What We Do:
• Centralized Management for all Army Multiple Rocket System Launcher platforms and associated Munitions suite
• Full Life-Cycle Management of Assigned Systems
• World Wide Support of Fielded Weapon Systems
• Key Link Between the User and Tech Base

What We Manage:
• Two Field Artillery Rocket/Missile Launcher Platforms
• Three MLRS Rocket and Two Missile Programs
• MLRS International Cooperative Development Program
• Seventy active FMS Cases with total case value of $2.59B
• Japanese (Fire Control and Rocket) and Korean (Rocket) Co-production

Vision:
To be a Highly Efficient, Effective, Agile, and Innovative Warfighter - Focused Organization for Developing and Sustaining Launcher, Rocket and Missile Systems

Workforce:
Military 8
Government 219
Support Contractors 82
Managing FY14
President’s Budget
$675M
FMS Undelivered Value $727M,
13 Countries
To Support the Warfighter

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Launcher Platform Overview

M270A1 Multiple Launch Rocket System (MLRS) Components

- HF Radio Comrod Loop Antenna
- Environmental Control Unit (ECU)
- Munitions Exhaust Blast Panel
- Reload Boom & Hoist System
- GPS Antenna
- Munitions Pod Firing Bays
- M269A1 Launcher Loader Module (LLM)
- Boom Controller (BC)
- Elevation Cylinder
- Crew Storage Box
- Boom Controller (BC)

Program Description

- Combat-proven tracked launcher
- Mounted on modified Bradley M993 chassis
- Lightly Armored / man-rated 3 Man crew cab
- Rapidly deployable via C-17 and C-5
- Operable 24/7 in all weather and visibility conditions
- Fires entire MLRS / ATACMS Family of Munitions
- Carries 2 Pods of 6 Rockets or 1 Missile each
- Uses Improved Fire Control System (IFCS)
- On-board Self Reload / Self location systems

M142 High Mobility Artillery Rocket System (HIMARS) Components

- Increased Crew Protection Cab (ICP)
- Driver Vision Enhancement Sensor
- Blue Force Tracker Antenna
- Munitions Exhaust Blast Panels
- Launcher Loader Module (LLM)
- Sponsors storage area for Fire Control System’s Line Replaceable Units
- Transparent Armor & Flash Shields
- XM1140A1 5-Ton Family of Medium Tactical Vehicles Chassis
- Central Tire Inflation System
- Automotive Batteries
- Elevation Manifold
- Turret

Program Description

- Combat-proven wheeled MLRS
- Mounted on modified M1140A1 five-ton FMTV chassis
- Armored / man-rated 3 Man crew cab
- Rapidly deployable via C-130 and C-17
- Operable 24/7 in all weather and visibility conditions
- Fires entire MLRS / ATACMS Family of Munitions
- Carries 1 Pod of 6 Rockets or 1 Missile
- Uses Universal Fire Control System (UFCS)
- On-board Self Reload / Self location system
## Rocket Systems Overview

**M31/M31A1**
- **Tail Section**
- **Rocket Motor Section**
- **Warhead Section**
- **Guidance & Control Section**
- **Characteristics**
  - General: Highly accurate, all weather, low collateral damage, precision munition
  - Range: 15 – 70+ Km
  - Target Set: Point targets located in Urban and Complex environments
  - Fuzing: Multi-mode options include point detonation, proximity (M31A1 only) and delay
  - Warhead: 200lb-Class High Explosive / Blast Fragmentation
  - Guidance: Tactical grade Inertial Measurement Unit (IMU) aided by GPS receiver
  - Flight Control: Accomplished by four canards driven by electromechanical actuators with trajectory shaping capability
  - Required Accuracy: Met with IMU independent of GPS
  - Launchers: Fired from US M142 HIMARS, M270A1 MLRS and FMS M270 derivatives

**GMLRS Unitary (GMLRS-U)**
- Spinning Tail Fins
- Electronic Safe and Arm Fuze
- Unitary Warhead

**M30E1**
- **Tail Section**
- **Rocket Motor Section**
- **Warhead Section**
- **Guidance & Control Section**
- **Characteristics**
  - General: Highly accurate, all weather, precision munition in development
  - Range: 15 – 70+ Km
  - Target Set: Area and imprecisely located targets
  - Fuzing: Multi-mode fuze used in proximity mode only achieving 10M height of Burst
  - Warhead: 200lb-Class High Explosive / Enhanced Fragmentation
  - Guidance: Tactical grade Inertial Measurement Unit (IMU) aided by GPS receiver
  - Flight Control: Accomplished by four canards driven by electromechanical actuators with trajectory shaping capability
  - Required Accuracy: Met with IMU independent of GPS
  - Launchers: Will be fired from US M142 HIMARS, M270A1 MLRS and FMS M270 MLRS derivatives

**GMLRS Alternative Warhead (GMLRS-AW)**
- Spinning Tail Fins
- Electronic Safe and Arm Fuze
- AW Warhead

**M28A2**
- **Tail Section**
- **Rocket Motor Section**
- **Non-Explosive Ballasted Steel Casing**
- **Characteristics**
  - General: Inert, all weather, un-guided/ free-flight ballistic rocket
  - Range: 8 – 15 Km
  - Target Set: N/A
  - Fuzing: None
  - Warhead: Inert blunt nosed steel casing containing non-explosive ballast
  - Guidance: None, fire stabilized, free-flight projectile flying monolithic trajectory
  - Flight Control: Four aft and stabilizer fins provide in-flight stability through constant counterclockwise spin. Initial spin imparted to rocket through spin rails mounted on inner wall of launch tube
  - Launchers: Fired from M142 HIMARS, M270A1 MLRS and FMS M270 MLRS derivatives

**Low Cost Reduced Range Practice Rocket (LCRRPR)**
- Steel nose cap and ballasted casing replaces tactical warhead

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*UNCLASSIFIED*
Missile Systems Overview

**M48 ATACMS QUICK REACTION UNITARY (QRU)**

- **Characteristics**
  - **General:** Highly accurate, all weather, low collateral damage, precision munition
  - **Range:** 70 – 270 Km
  - **Target Set:** Stationary point targets and targets within Urban and Complex environments
  - **Fuzing:** Point detonating fuze
  - **Warhead:** 500lb-Class High Explosive Blast Fragmentation
  - **Guidance:** GPS aided inertial guidance system
  - **Flight Control:** Accomplished by four aft fins driven by electro-mechanical actuators
  - **Required Accuracy:** Met with IMU independent of GPS
  - **Commonality:** Guidance, propulsion and control identical to predecessor ATACMS
  - **Logistics:** Missile stored / fired from Guided Missile Launch Assembly (GMLA); shelf life 10 years
  - **Launchers:** Fired from M142 HIMARS and M270A1 MLRS
  - **Tactical Operations:** Over 80 Unitary missiles fired in OIF/OEF

**M57 ATACMS 2000 (T2K)**

- **Characteristics**
  - **General:** Highly accurate, all weather, low collateral damage, precision munition
  - **Range:** 70 – 270 Km
  - **Target Set:** Stationary point targets and targets within Urban and Complex environments
  - **Fuzing:** Point detonating fuze
  - **Warhead:** 500lb-Class High Explosive Blast Fragmentation
  - **Guidance:** GPS aided inertial guidance system. M57 has vertical attack capability
  - **Flight Control:** Accomplished by four aft fins driven by electro-mechanical actuators
  - **Required Accuracy:** Met with IMU independent of GPS
  - **Commonality:** Upgraded guidance, propulsion and control systems
  - **Logistics:** Missile stored / fired from Guided Missile Launch Assembly (GMLA); shelf life 10 years
  - **Launchers:** Fired from M142 HIMARS and M270A1 MLRS
  - **Tactical Operations:** Over 80 Unitary missiles fired in OIF/OEF
M270A1 / M142
Modification Strategy

- Maintain long term viability of both platforms
- Respond to Army capability needs
- Mitigate obsolescence
  - Predominantly electronic components
  - Incorporate technology updates
  - Update of Fire Control System (FCS-U program)
- Reduce cost and “footprint” of logistics support
  - Leverage Bradley and FMTV carrier changes (Rebuild)
M270A1 Improved Armored Cab (IAC) and Fire Control System Update (FCS-U)

M270A1 IAC Exterior Layout

- Increases crew protection on par with HIMARS ICP Cab
- Protects crew from Improvised Explosive Devices (IED), artillery fragmentation, and small arms fire
- Provides more crew/equipment space with larger cab
- Rearranges crew positions to standardize crew drills between M270A1 and M142 platforms
- Uses combat proven armor and latest transparent material
- Not new start, implements modification effort (ECP/MWO)

Fire Control System – Update (FCS-U)

- Upgrades current M270A1 Fire Control System
- Resolves known/mitigates future obsolescence issues
- Maintains technical capability of M270A1
- Restores Fire Control System commonality between M142 and M270A1
- Maximizes re-use of existing technologies and hardware
- Leverages Smart Displays of other Army Systems
- Provides potential FMS opportunities for Fire Control System Updates

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DVE / BFT / LRC Equipment

**M270A1 Configuration**

- **Driver’s Vision Enhancement (DVE)**
  - Provides ability to conduct day/night operations or maneuver in smoke, fog, dust or other battlefield obscurants
  - Provides situational awareness for the launcher crew

- **Blue Force Tracker (BFT)**
  - Provides Situational Awareness
  - Reduces Fratricide risk
  - Provides for Common Tactical Picture
  - Allows for greater ability to communicate

- **Long Range Communications (LRC)**
  - Provides secure Long Range Communications via installation of antenna and delta kit for HF radios
  - Reduces physical/electronic footprint of FDCs by expanding reach
  - Provides tactical flexibility when positioning launchers

**M142 Configuration**

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M142 SAFirE Transparent Armor and Crew Chief Restraint System (CCRS)

SAFirE Transparent Armor

- Transitions US HIMARS Fleet to Sapphire-Glass solution for better ballistic performance / long term supportability
- Precludes use of Mylar peel ply film to meet blowing sand abrasion requirements
- Improves night vision goggle performance
- Reduces Transparent Armor weight maintaining cab/system weight requirements

CCRS Harness / Retractor / Swing Seat

- New Swing Seat: Lowers Defilade
- Includes Retractor Plate to secure harness and prevent ejection
- Precludes the Crew Chief / Commander from being ejected during vehicle accidents or rollovers.
- Introduces swing seat assembly that keeps crew chief or commander in the “name tag” defilade position while vehicle is moving.
- Provides seating support that minimizes fatigue during extended road march or convoy operations

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Products and Systems Overview

**Concept and Technology Development**
- Long Range Precision Fires (LRPF)
- ATACMS Mods

**Engineering and Manufacturing Development**
- M30E1 GMLRS-AW
- M31A1 GMLRS-U
- M28A2 LCRRPR
- M26 / M26A2 (DEMIL & LCRRPR Production)

**Production and Deployment**
- M270A1 MLRS
- M28A2 LCRRPR
- M30 / M31 GMLRS-U
- M270A1 MLRS
- M270A1 MLRS IAC
- M26 / M26A2 (DEMIL & LCRRPR Production)

**MODS and Software Updates**
- FCS-U
- M39 / M39A1 GMLRS-U
- M142 HIMARS
- M270A1 MLRS
- M142 HIMARS
- M270FMS
- M28A2 LCRRPR
- M30 / M31 GMLRS-U
- M270A1 MLRS
- M142 HIMARS
- M48 & M57 ATACMS Unitary
- M142 HIMARS
- M270FMS
- M57 ATACMS Unitary

**Operations and Support**
- M26 / M26A2 (DEMIL & LCRRPR Production)
- M39 / M39A1 ATACMS Blk I / IA (DEMIL)

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Summary

• PFRMS Launchers and Munitions continue to effectively support Overseas Contingency Operations (OCO).

• Over 2640 GMLRS and 565 ATACMS were fired during OIF / OEF combat operations.

• The MLRS Family of Launchers and Munitions will remain in the Army inventory beyond 2040.

• MLRS Launchers and Munitions are deployed in the artillery forces of 18 nations.