



Precision Fires Rocket and Missile Systems



PFRMS Launcher and Munitions System Overviews

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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 Launch 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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PFRMS



Worldwide Third Party Sales

MOU Partners



US
HIMARS/M270A1



UK
M270B1-UFCS



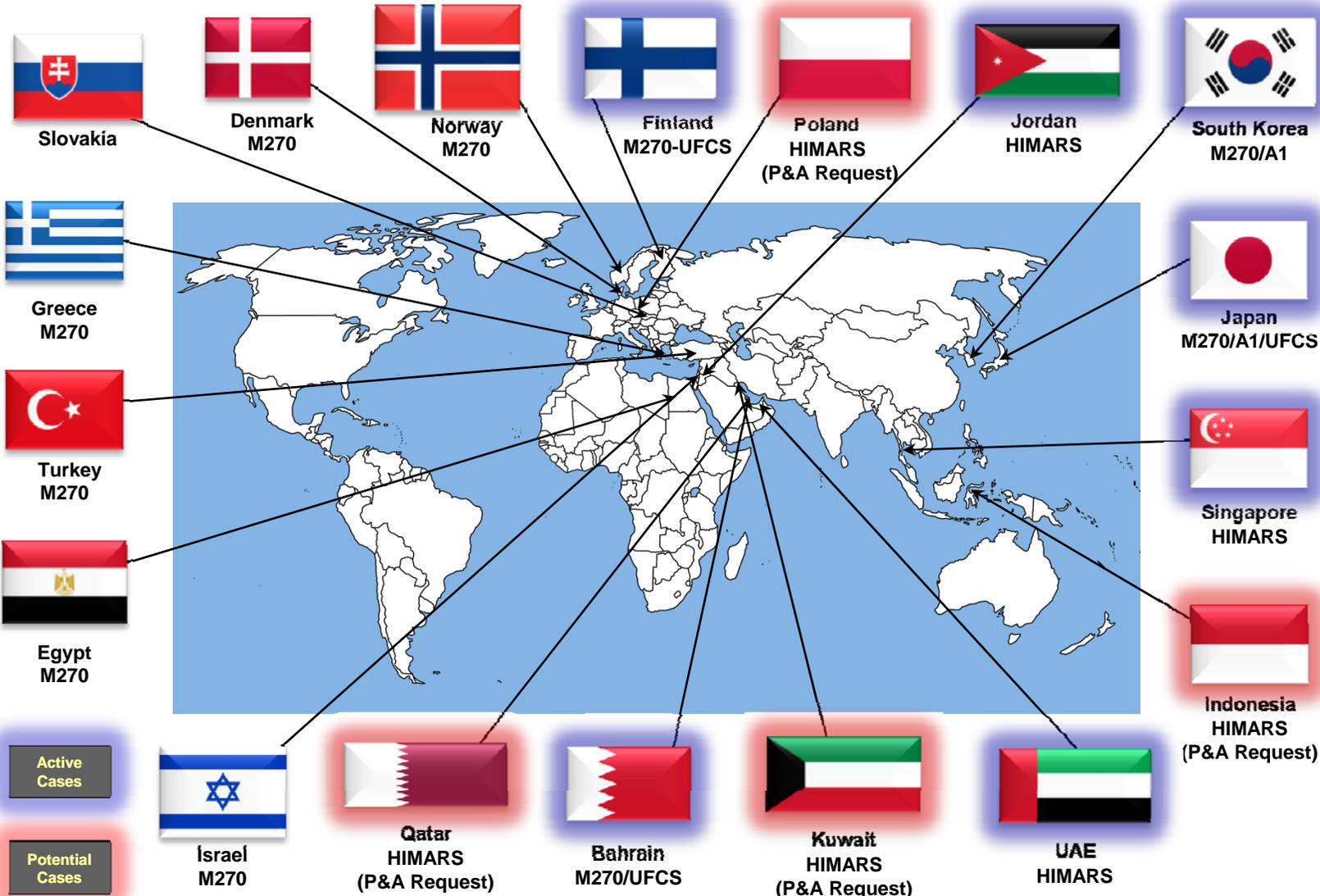
France
M270/EFCS



Germany
M270/EFCS



Italy
M270



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Launcher Platform Overview



M270A1 Multiple Launch Rocket System (MLRS) Components



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



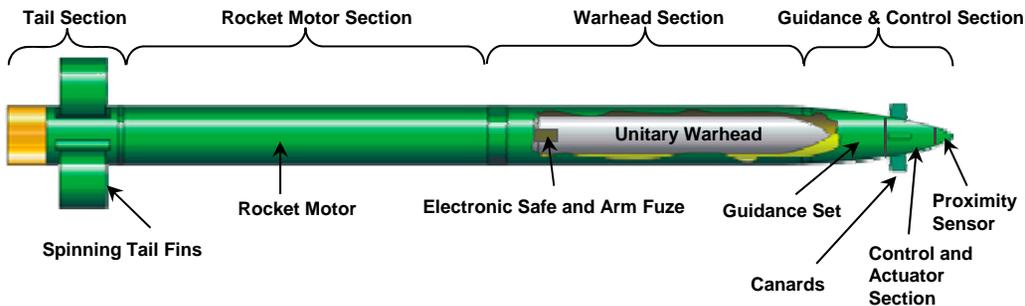
Program Description

- 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

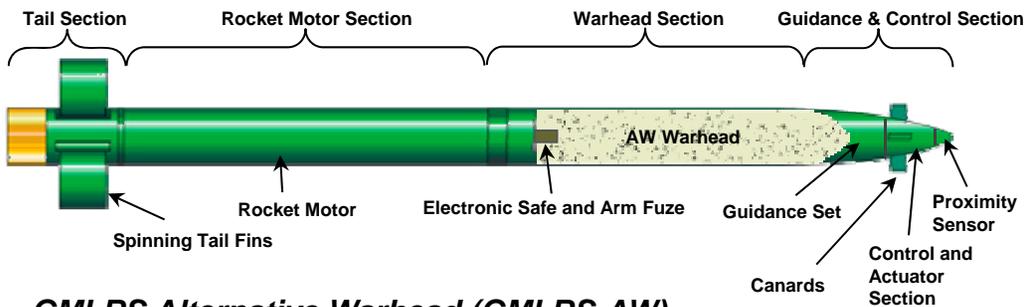


GMLRS Unitary (GMLRS-U)

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
- Commonality: 90% reuse of other GMLRS munitions components
- Logistics: 6 rockets stored/fired from launch pod/containers (LPCs), shelf life 10 years
- Launchers: Fired from US M142 HIMARS, M270A1 MLRS and FMS M270 derivatives
- Tactical Operations: Over 2,000 M31/M31A1 rockets fired by Army, Marine and United Kingdom forces supporting OIF/OEF

M30E1

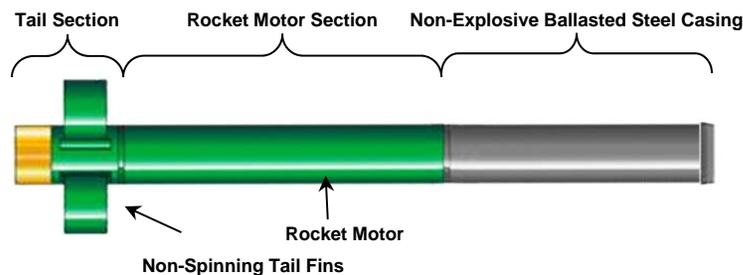


GMLRS Alternative Warhead (GMLRS-AW)

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
- Commonality: 90% reuse of other GMLRS munitions components
- Logistics: 6 rockets stored/fired from launch pod/containers (LPCs), shelf life 10 years
- Launchers: Will be fired from US M142 HIMARS, M270A1 MLRS and FMS M270 derivatives

M28A2



Steel nose cap and ballasted casing replaces tactical warhead

Low Cost Reduced Range Practice Rocket (LCRRPR)

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, fin stabilized, free-flight projectile flying monolithic trajectory
- Flight Control: Four aft end 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
- Logistics: 6 rockets stored/fired from launch pod/containers (LPCs), shelf life 20+ years
- Launchers: Fired from M142 HIMARS, M270A1 MLRS and FMS M270 MLRS derivatives

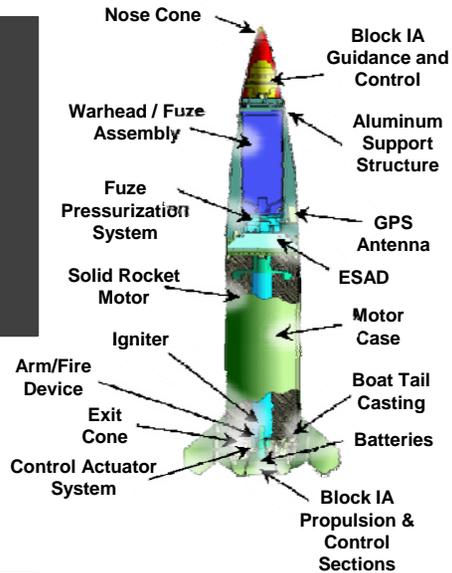
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Missile Systems Overview

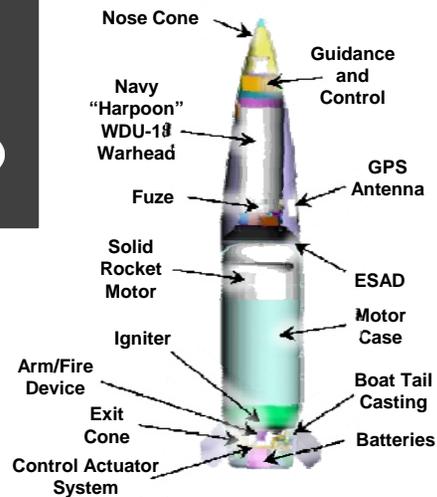


**M48
ATACMS
QUICK
REACTION
UNITARY
(QRU)**



- 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 13 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



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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)



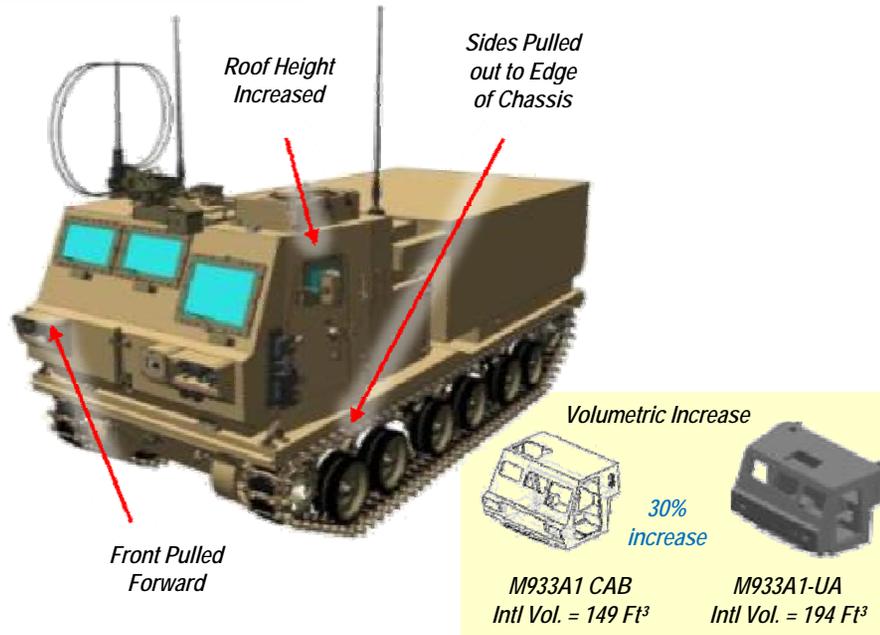
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M270A1 Improved Armored Cab (IAC) and Fire Control System-Update (FCS-U)



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

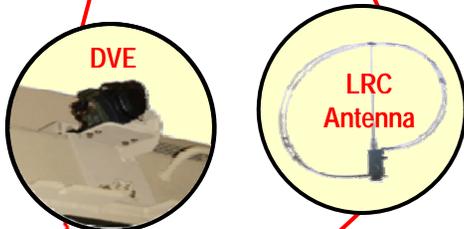


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DVE / BFT / LRC Equipment

M270A1 Configuration



M142 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

M270A1 Configuration



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



SAFirE Transparent Armor

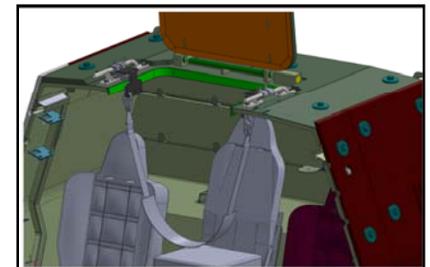


- Transitions US HIMARS Fleet to Sapphire-Glass solution for better ballistic performance / long term supportability
- Precludes use of Mylar peel ply film to meet blowing sand abrasion requirements
- Improves night vision goggle performance
- Reduces Transparent Armor weight maintaining cab/system weight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



Products and Systems Overview

CONCEPT AND TECHNOLOGY DEVELOPMENT

Long Range Precision Fires (LRPF)



ATACMS Mods

ENGINEERING AND MANUFACTURING DEVELOPMENT

Fire Control System Enabling Technologies

M30E1 GMLRS-AW



M270A1 MLRS



FCS-U



M142 HIMARS



M270A1 MLRS IAC

PRODUCTION AND DEPLOYMENT

MODS and Software Updates

M31A1 GMLRS-U



M28A2 LCRRPR



M142 HIMARS



M270A1 MLRS



M270 FMS



M57 ATACMS Unitary FMS

OPERATIONS AND SUPPORT

M28A2 LCRRPR



M30 / M31 GMLRS-U



M26 / M26A2 (DEMIL & LCRRPR Production)



M270A1 MLRS



M142 HIMARS



M48 & M57 ATACMS Unitary



M39 / M39A1 ATACMS Bk 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.

