Mortar Conference

23-24 Oct 2013

Presented by:
Office of the Product Manager for
Guided Precision Munitions and Mortar Systems
OPM GPM2S

LTC Will McDonough
Product Manager
Agenda

- Organization
- System Portfolio
- Operation Enduring Freedom (OEF) Update
- Affordable Precision
PEO Ammunition Vision

Develop and Procure Conventional and Leap-Ahead Munitions to Increase Combat Power to Warfighters
PM CAS Goals

Get Smart and Precision-Guided Munitions to the Warfighter
Improve and Sustain Conventional Munitions
Satisfy Customers and Achieve Excellence
Grow World-Class People and Teams
Current Mortar Weapons / Ammunition

60/81/120mm Capabilities:
✓ High Explosive
✓ Smoke
✓ Illumination (visible)
✓ Illumination (infra-red)
✓ Training

M120/M120A1/M121 - 120mm Battalion Mortar System

120mm Mortar Ammo
- M934A1 High Explosive Multi-Option Fuze (Combat Round)

M224 - 60mm Lightweight Company Mortar System

M252 - 81mm Mortar System

60/81/120mm Mortar Weapons / Ammunition:
- High Explosive
- Smoke
- Illumination (visible)
- Illumination (infra-red)
- Training

XM395 Accelerated Precision Mortar Initiative (APMI)
New: 2011

60mm Mortar Ammo
- M767 Infrared Illumination
- M769 Full Range Training Round
- M721 Visible Light Illumination
- M722A1 Smoke
- M768 High Explosive Point Detonation Fuze (Training)

81mm Mortar Ammo
- M879 Full Range Training Round
- M819 Smoke
- M816 Infrared Illumination
- M853A1 Visible Light Illumination
- M821A1 High Explosive Multi-Option Fuze (Combat Round)
- M899 Smoke
- M821A1 High Explosive Multi-Option Fuze (Training)
### Mortar Modularity

<table>
<thead>
<tr>
<th></th>
<th>Per RSTA* Squadron</th>
<th>Per Company</th>
<th>Per Battalion (Mortar Platoon)</th>
<th>Total</th>
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<tbody>
<tr>
<td>Heavy BCT</td>
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<td></td>
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<tr>
<td></td>
<td>6 x 120mm (mounted)</td>
<td></td>
<td>4 x 120mm (mounted)</td>
<td>14 - 120mm</td>
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<td></td>
<td></td>
<td></td>
<td>1 FDC</td>
<td></td>
</tr>
<tr>
<td>Infantry BCT</td>
<td>4 x 120mm (dismounted)</td>
<td>2 x 60mm per Section (3 Sections per BN)</td>
<td>4 x 120mm (dismounted)</td>
<td>2 Battalions (Bns) per Brigade (Bde)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1 FDC</td>
<td></td>
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<tr>
<td>Ranger Regiment</td>
<td></td>
<td>Mortar Arms Room</td>
<td>4 x 120mm</td>
<td>3 Bns per Regiment</td>
</tr>
<tr>
<td>Stryker Brigade Combat Team</td>
<td>6 x 120mm (mounted)</td>
<td>2 x 120mm (mounted)</td>
<td>4 x 81mm</td>
<td>4 x 120mm (mounted)</td>
</tr>
</tbody>
</table>

U.S. ARMY IS MODIFYING CURRENT HEAVY AND LIGHT DIVISIONS
END RESULT: INCREASED REQUIREMENT FOR 60MM AND 120MM MORTARS

PM GPM2S is Fully Engaged in Supporting Modularity

**RSTA** = Reconnaissance, Surveillance, and Target Acquisition; **Bde** = Brigade; **Rgt** = Regiment; **Bn** = Battalion; **BCT** = Brigade Combat Team; **Co** = Company; **FDC** = Fire Direction Center
Mortar Overview

Lightweight 60mm and 81mm Mortars
- M224A1
- M252A1

Lightweight Handheld Mortar
- Ballistic Computer
- Software

M326 Mortar
- Stowage Kit
- M1101 Trailer with M326 Installed

Basic Issue Items (BII)
- Tool Kits
- Sight Units
- Aiming Post Lights
- Aiming Posts

MFCS for STRYKER
- Gunner's Display
- PDA
- SINCgars Radio
- Commanders Interface
- Driver's Display
- Software

M150 MFCS-Dismounted
- Gunner's Display
- Fire Control Computer
- Driver's Display
- Pointing Devices
- Software

New Equipment Training
- Kitting, Staging, and Fielding

MK5 MFCS - Mounted
- Gunner's Display
- PDA
- SINCgars Radio
- Commanders Interface
- Driver's Display
- Software

M326 Mortar Stowage Kit
- M1101 Trailer with M326 Installed

Basic Issue Items (BII)
- Tool Kits
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- Aiming Post Lights
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MFCS for STRYKER
- Gunner's Display
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M150 MFCS-Dismounted
- Gunner's Display
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- Software

New Equipment Training
- Kitting, Staging, and Fielding
Reduction in Weight: 60mm Mortar System

Legacy M224 Mortar

- M25 Cannon: 14.4 lbs / 6.5 kg
- M170 Bipod: 15.2 lbs / 6.9 kg
- M7 Baseplate: 14.4 lbs / 6.5 kg
- Total: 44.0 lbs / 20.0 kg

Lightweight M224A1 Mortar

- M225A1 Cannon: 13.0 lbs / 5.9 kg
- M170A1 Bipod: 12.85 lbs / 5.8 kg
- M7A1 Baseplate: 9.2 lbs / 4.2 kg
- Total: 35.05 lbs / 15.9 kg

Total Weight Savings: 8.95 lbs / 4.1 kg (20%)

Latest Improvement: Upgraded Assault Baseplate (4.9 pounds / 2.2 kg)

- Allows Charge 0 – 4 firing in hand-held mode (no bi-pod), previously only Charge 0 – 1
- Result: 3.5 km range with 17.9 pound / 8.1 kg weapon system
Reduction in Weight: 81mm Mortar System

<table>
<thead>
<tr>
<th>Legacy M252 Mortar</th>
<th>Lightweight M252A1 Mortar</th>
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<tbody>
<tr>
<td>M253 Cannon</td>
<td>M253 Cannon</td>
</tr>
<tr>
<td>30.5 lbs / 13.8 kg</td>
<td>30.5 lbs / 13.8 kg</td>
</tr>
<tr>
<td>M177 Bipod</td>
<td>177A1 Bipod</td>
</tr>
<tr>
<td>27.0 lbs / 12.2 kg</td>
<td>21.3 lbs / 9.7 kg</td>
</tr>
<tr>
<td>M3A1 Baseplate</td>
<td>M3A2 Baseplate</td>
</tr>
<tr>
<td>29.0 lbs / 13.1 kg</td>
<td>23.0 lbs / 10.4 kg</td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>86.5 lbs / 39.2 kg</td>
<td>74.8 lbs / 33.9 kg</td>
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</table>

Total Weight Savings: 12.0 lbs / 6.8 kg (14%)

Status: Production Verification Testing / Fielding 2014
Lightweight Mortar Ballistic Computer
LHMBC

Features:
• Provides digital connectivity on the fire support network
• Embedded GPS
• Contains ballistics for all current US 60mm, 81mm & 120mm ammunition
• Weighs less than 4 lbs.

User Benefit:
• Increased responsiveness
• Increased Accuracy
• Links mortars to the digital battlefield

Status:
• In Production
• Over 2,200 systems delivered
• New Hardware (M32A1 being qualified due to M32 obsolescence, fielding planned 2015
120mm Accelerated Precision Mortar Initiative
Yearly Expenditures
Operation Enduring Freedom, as of 15 Oct 2013

Significant Increase in APMI Firings in 2013
Affordable Precision

Technology to add a Guidance Kit to Artillery Projectiles and Mortar Cartridges is Highly Mature:
Multiple Solutions have been successfully demonstrated with minor changes per configuration.

US Army & Marine Corps: 155mm Precision Artillery (PGK)

M795 and M549A1

M934 body

Tail Kit

Army: 120mm Precision Smoothbore Mortar (XM395)

USMC: 120mm Precision Rifled High Explosive (PRHE)

USMC: 120mm Precision Extended Range Munition (PERM)
Advanced Mortar Protection System (AMPS)

- Recoiling 120mm smooth bore Mortar weapon
- Digital Fire Control
- Electronic Drive System (EDS) for 360 degree azimuth and elevation adjustment

Advanced Direct Indirect Mortar (ADIM)

- Recoiling 81mm smooth bore Mortar Weapon
- Direct and indirect Fire
- Digital Fire Control
- 360 azimuth, -3 to 85 Elevation
- 30 rounds per minute rate of fire
Summary

• Investments Improving the Performance of Mortar Systems Continue
  – Lighter-weight Weapons (60mm and 81mm)
  – Improved Fire Control
  – Precision Ammunition

• Results will be Leap Ahead Precision Effects Capabilities for the Maneuver Commander
Contact Information

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