Integration of a Remotely Operated, Breech Loaded 120 mm Mortar Platform

BRIEFING FOR THE GUNS & MISSILES SYMPOSIUM - 26 APRIL 2007

Providing America Advanced Armaments for Peace and War

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Remotely Operated 120 mm Mortar Technology

INTRODUCTION

US ARMY RDECOM-ARDEC
Weapon Systems & Technology Directorate

Generate Technology Concepts
Execute Life Cycle R&D
Partner with OGA, Industry & Academia

Indirect Fire Systems Division
Objective NLOS-M Technology ATO
Laser Ignition for Cannon Artillery
Artillery & Mortar Systems
Remotely Operated 120 mm Mortar Technology
PROJECT OVERVIEW

- 120 mm Automated Mortar
- Breech Loaded
- In-line Autoloader/46 Round Magazine
- Integrated Titanium Turret and Cradle

14 rpm Maximum Rate of Fire

Live Fire Demonstrations from Hardstand and M113 Armored Personnel Carrier

120 MM TURRETED MORTAR CAN BE MOUNTED ON A VARIETY OF FIXED OR MOBILE PLATFORMS
Remote Operated 120 mm Mortar Technology

BACKGROUND

• Trade-offs
  – Elevating Turret vs. Elevating Gun
  – Smooth Bore vs. Rifled Bore

• Design
  – ARDEC: Cannon, Recoil Mechanism, Turret, Fire Control
  – Western Design: Ammunition Handling Design and Fabrication
  – General Atomics: Turret Structural Design

• Fabrication
  – ARDEC: Titanium Turret
  – Watervliet Arsenal: Cannon Tube and Breech
  – Rock Island Arsenal: Recoil Mechanism

• Integration - ARDEC
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TURRET

Azimuth, Elevation and Breech Control
Fire Control
Communications
Power Distribution
Magazine
Breech & Cam Plate
Autoloader Control
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ARMAMENT

- Cannon Design Features (XM325)
  - Screw Block Breech
  - 3 Meter, Smooth Bore Mortar Tube
  - Round Positioning and Retention Features
  - Anti Fall-Back Latch
  - Solenoid Actuated Firing Mechanism
  - Breech Open Via Cam Plate

- Gun Mount
  - Independent Recoil and Recouperator Modules
  - Cradle Integral with Turret
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AMMUNITION HANDLING

Bridge Assembly

46 Magazine Canisters

Clamp Assembly

Rammer Assembly/Load Tray
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FIRE CONTROL

Mortar Fire Control System (MFCS)

CROW – MS Windows based processor

- Gun as FDC
- Network Fires
- Remotes Fires
- Autonomous Operations

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ARDEC

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TESTING

**Mount Checkout and Proof Test - Picatinny Gun Shed**

15 Rounds Fired
Charge 0 – Charge 4+
Proofed Cannon
19,700 psi
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TESTING

Aberdeen Test Center Live Fire Demonstration
177 Rounds
Charge 1 – Charge 4
30° QE
Automated Multi-Round Missions
14 rpm Rate of Fire
Ballistic, Recoil and Thermal Data Acquisition
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ROWST Mortar

Aberdeen Test Center Live Fire Demonstration

- 30 Rounds
- Charges 2 and 4
- 0° and 30° QE
### Mortar Turret

- **Weight:** 5 Tons
- **Dimensions:** 191” x 98” x 36.5”
- **Features:** Remotely Operable

### Turret on M113 A2

- **Weight:** 17 Tons
- **Dimensions:** 222” x 100” x 108”
- **Compatibility:** C130 Compatible with Modification

### Turret on LAV-25

- **Weight:** 15 Tons
- **Dimensions:** 253” x 99” x 114”
- **Compatibility:** C130 Compatible with Modification

### Turret on Stryker

- **Weight:** 23 Tons
- **Dimensions:** 275” x 105” x 116”
- **Compatibility:** C130 Compatible with Modification

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