Precision Guided Projectiles for the Joint Force Commander

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Field Artillery
Relevant and Ready

Today and Tomorrow

Must Deliver Precision Effects.

**Capability** to rapidly and accurately locate and attack targets with the required operational responsiveness matched to desired effects (lethal and non-lethal) and the greatest efficiency.
Artillery & Accuracy

- Keep Lethal Fire on Target Longer
- Improves Close Fight
- Limits Collateral Damage
- Decreases Logistics Footprint
Excalibur Program Overview

- Joint international program with Kingdom of Sweden
- Accelerated for Fielding in FY06
- Gun Hardened GPS/INS Guidance – to 18 kgs
- 155 mm round compatible with: Paladin, JIW155, FCS NLOS-C and KOS 155 platforms
- Direct fit for Navy DD-X Medium Range Requirement (MRLAP)
- Reliability Growth & Lean Design Planned/Funded
- Modular Design -- Supports Growth

Excalibur System Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
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<tbody>
<tr>
<td>Range</td>
<td>41 km</td>
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<tr>
<td>Length</td>
<td>.987 m</td>
</tr>
<tr>
<td>Weight</td>
<td>105.5 lb</td>
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<tr>
<td>CEP</td>
<td>~6 m</td>
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Excalibur Provides Precision Effects For Artillery
Operations

- Gun & Target Location
- Trajectory Information
- GPS Crypto Keys and Precise Time
- Fuze Setting
- Power

Mission Planning

- Precision Delivery Regardless of Range
- Limits Collateral Damage
- Decreases Volume of Fire Per Engagement
- Enhances Soldier Survivability

System Initialization

- Deploy Canards prior to Apogee (Ballistic prior to Apogee)

GPS Acquisition and Track

- Impact Near Vertical for Max Lethality

Top Attack, 3 Fuze Options:
- Height of Burst
- Point Detonating
- Delay/Penetration

Structure Top Attack (Detonation after Penetration)

Up-link to adjust targeting

Latitude / Longitude / Altitude

M707 Knight w/FS3
Stryker FSV w/FS3
A/2 A/3 BFIST
OH-58D

Sensors:

Deploy Canards prior to Apogee (Ballistic prior to Apogee)
Platform Integration & Characterization

- Test Program Aligned With Operational Fielding Needs
  - M777 for Early Fielding
  - M109A6
  - Swedish Requirements
- Instrumented test firings at multiple charge zones & multiple platforms
  - In bore requirements
  - Measure critical HW response
- Margin testing beyond requirements will ensure reliability objectives are high

Robust Design Across Multiple Platforms
“Joint Fires” →

Joint Time Sensitive Targeting (TST)
Joint Interdiction
Joint Close Air Support (CAS)
Naval Surface Fire Support
Call-for-Fire
Joint Suppression of Enemy Air Defenses (SEAD).
The Targeting Challenge...

- Improvements to organic sensors:
  - LLDR: 80m to 5m
  - Shadow TUAV: .. to 10m...

- AFATDS Fire Control Enhancements
  - Precision sheafing
  - Target mensuration
  - Integration of “AF/Navy” tools such as Precision Targeting Workstation (PTW)....

- Leveraging Network Centric Resources
  - FCS Net
  - Distributed Common Ground System (DCGS)
  - Utilization of Joint ISR assets...

Army Will Benefit From AF/Navy Targeting “Lessons Learned”
Net Centric Operations – Tying It All Together

Internet Analogy – every weapon, sensor, platform has an IP address
Excalibur Capability Required Today

Excalibur Provides Rapid, Lethal Effects for the Urban/Close Fight

147 Conventional Rounds (M549)

- Urban command post
- 20m X 20m structure
- 10m Target Location Error

3 Excalibur Rounds
Summary

• The Joint Force Commander (JFC) needs responsive, multiple effects from fully networked and integrated fire support platforms.

• Excalibur and operational networks are on track to provide additional resources to JFC.

• Advances in targeting, networks, low cost seekers, data links and multiple effects warheads will enable artillery to remain “Ready and Relevant” for the long term.
Field Artillery
Relevant and Ready
Today and Tomorrow

Our Mission

Create the Thunder