

At a Glance

What is it?

- The Precision Urban Mortar Attack program is designed to bring precision delivery, extended range and complex terrain insertion capability to existing 81mm mortar organic fires, through guided ammunition, laser targeting and net-centric communications.

How does it work?

- M821/M889 ammunition is upgraded with Flight Controlled Mortar (FCMortar) guidance kit
- FCMortar can be guided with both global position system (GPS) coordinates and any STANAG 3733 compliant semi-active laser (SAL) designator and those with lower pulse energy output
- For complex terrain environments (e.g., urban, canyons, hills/mountains), in-flight trajectory shaping orients weapon approach vector to target for maximum insertion probability (minimizes collateral damage)
- Deploys with mission setter tool upgrade for an M32 lightweight, handheld mortar ballistic computer to allow for preflight fire control solutions, mission data and fuze mode programming

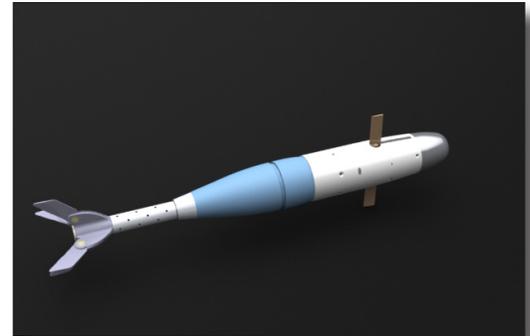
What will it accomplish?

- This system will allow for precision indirect fires with the capability to engage targets otherwise obstructed by terrain features and/or restricted by collateral damage considerations or GPS-denied environments, and extended range capability for organic 81mm fire support assets.

Point of Contact

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Precision Urban Mortar Attack (PUMA) is a Future Naval Capabilities (FNC) program that brings together technologies developed under several Office of Naval Research programs such as FCMortar and Extended Range Mortar Ammunition (ERMA), along with future external targeting systems and existing indirect fire systems to achieve delivery capabilities beyond basic precision.



The FCMortar guidance kit will provide the capability to vector the approach of the mortar to avoid terrain obstructions, allowing engagements in terrain not normally accessible by indirect fire weapons systems. Use of semi-active laser (SAL) designators on unmanned autonomous systems and ground-based platforms will allow for targeting option flexibility while eliminating target location error and providing operational capabilities even in GPS-denied environments. ERMA-developed propellants along with FCMortar's trajectory-shaping capability will enhance the maximum range achievable by the 81mm mortar system to that of an M120mm mortar system. This will substantially increase the area that dismounted mortar systems can cover. When combined with net-centric communications, PUMA will provide responsive first round on-target capability.

This program is unique through its treatment of the fires problem from a systems perspective versus just enhancing the lethality or delivery accuracy of the weapon itself. By considering the targeting systems, terrain, targets, fire control and other impacts, a broader spectrum of capabilities is potentially achievable through the exploitation and integration of both novel and existing technologies. The extension of operational range, precision/first-round on-target and engagement of targets in previously inaccessible terrain types will allow the warfighter greater operational reach and flexibility, especially in a distributed combat environment.

The program has demonstrated structural survivability of the FCMortar guidance kit and is preparing for its initial GPS-based guided flight demonstrations in 2011.

Research Challenges and Opportunities:

- Body-fixed, strap-down SAL seeker
- Low-cost, high-performance control actuation system for nonballistic flight path control
- Sub-system miniaturization and integration