



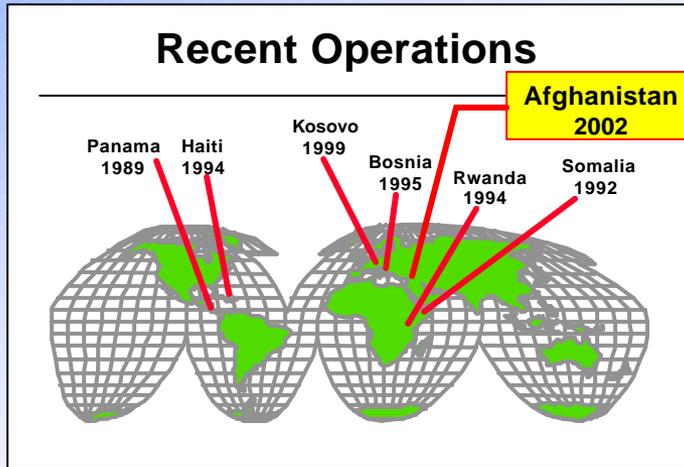
2002 International Infantry and Joint Services Small Arms Symposium and Exhibition

**XM 395
Precision Guided Mortar Munition
(120mm PGMM)**

**Anthony Pezzano
PM Mortars**

PEO Ammunition

Threat



There is an immediate and significant need to responsively engage small protected targets from a distance while minimizing collateral damage.

- **Identified Deficiency**
 - Forces unable to responsively neutralize time urgent, protected targets.
 - Enemy damages blue forces in relative safety.
- **Mission Need**
 - Organic, responsive, indirect fire, precision strike munition that has significant capability against a variety of protected targets confronting the maneuver commander in a variety of operational circumstances.
- **Primary Targets**
 - Threats within protective cover
 - Threats
 - Shoulder launched grenade launchers (RPG-7s)
 - Automatic Weapons (machine guns, crew served weapons, etc.)
 - C2 nodes, command posts, observers, etc.
 - Protective cover
 - Bunkers, fortified positions
 - Buildings, structures
- **Secondary Targets**
 - Vehicles (moving and stationary)
 - Light Wheeled
 - Heavy Re-supply

Mortar Infrastructure In Place



Forward Observers and Designators



Mortar Fire Control System



Towed 120mm
(Ground Mounted)



Vehicle Mounted 120mm
M113 Variant



IAV (BCT)

- **Fielded or Development Programs**
 - **120mm Mortars in current infrastructure**
 - 120mm Mortar Platforms: M121 (carrier-mounted), M120 (towed mortar), Interim Armored Vehicle - Mortar Carrier (IAV-MC)
 - 120mm Mortar Munitions: HE, Smoke, Illumination (Visible & Infrared)
 - **Light-weight Laser Designator Range Finder (LLDR)**
 - **Fire Control / Command & Control Links**
 - Mortar Fire Control System (MFCS)
 - Advanced Field Artillery Tactical Data System (AFATDS)

PGMM

Compatible with Existing and Future Battalion Indirect Fire Systems

Precision Guided Mortar Munition (PGMM)

Lethality for Army Transformation

Description

- 120mm Precision Guided Mortar Munition
- Hit point targets with Precision
- Incapacitate Personnel protected within:
 - Earth and timber bunkers
 - Masonry walls
 - Lightly armored vehicles
- Engage targets at Extended Ranges – 12 km Required, 15 km Desired
- Compatible with the 120mm Mortar System



Accuracy: 1m CEP
 Max Range: 15 km
 Weight: <35 lb
 Length: <40 inches

Legacy



Interim



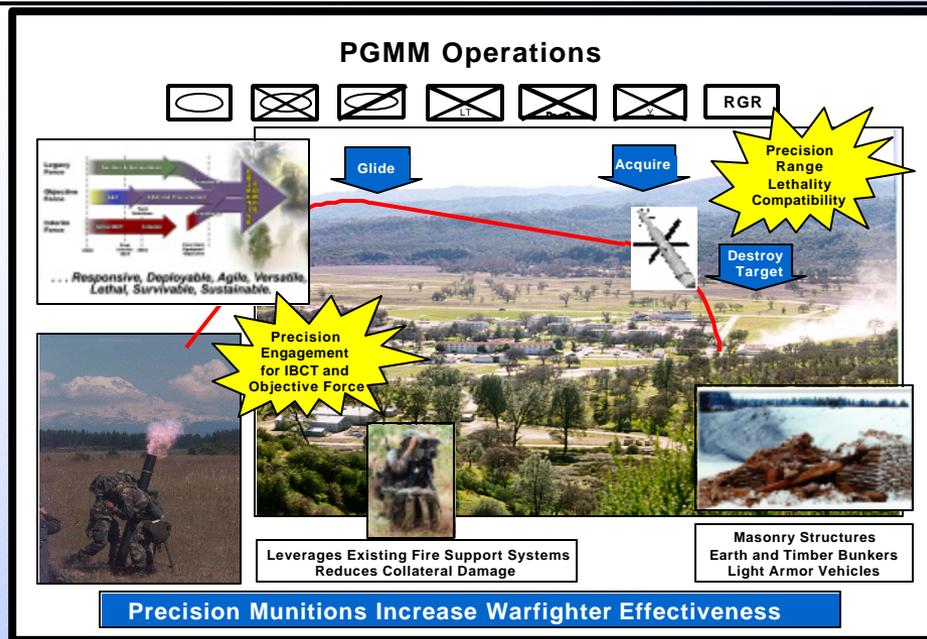
Objective



Prime Contractor:
 - Lockheed Martin
 Major Subs:
 - Diehl (Airframe & CAS)
 - Draper (Gyro)

Status

- Advanced Technology Demonstration (ATD) complete
 - ATD Design Assessed at TRL 5 by Army Warfighter Tech Council (WTC)
- Component Advanced Development (CAD: 02-03)
 - Transition to Acquisition System
- Blocking Requirements to Achieve Success
- Acquisition Program Funded, beginning FY04
- Production Funded, beginning FY07
- LSI shows PGMM is #1 killer in Area of Operations



Flight Test Video Clip

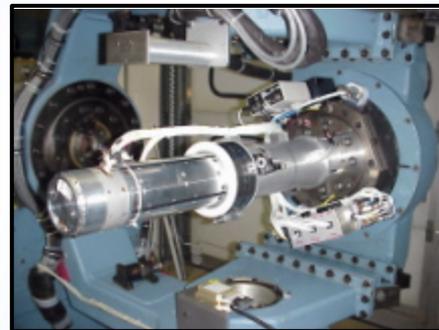
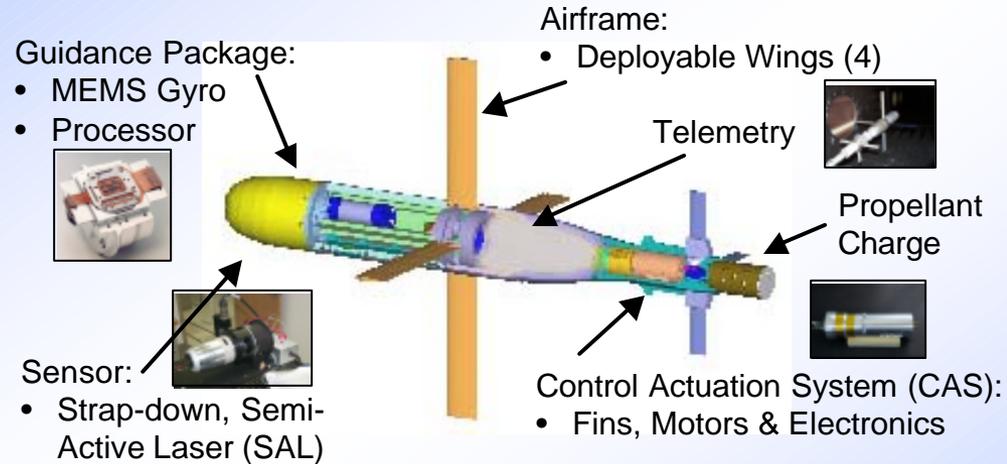


- **Demonstration Objectives**

- fin deployment at launch
- wing deployment at apogee
- pre-programmed maneuver
- controlled glide to extended range
- target impact

PGMM TRL Assessment

- PGMM subsystems successfully live-fire tested and performance tested (post Hi-G).
 - No warhead or fuze
- Flight Demonstration hardware completed Hardware in the Loop acceptance testing (Sep 01).
- Flight Demonstration completed 18, 19 October at YPG.
 - Round 1: Telemetry / squib fire electronics failure at launch, round flew ballistic (no guidance)
 - Round 2: Flew stably to end game, missed target



Hardware-in-the-Loop (HWIL)



ATD Demonstration

Subsystem	Current TRL	ATD Exit Criteria (Subsystem Test, Live Fire)
Guidance Package	6	Subsystem Live Fire Complete, Performed in System Demo (OCT 01)
Airframe	6	Subsystem Live Fire Complete, Performed in System Demo (OCT 01)
CAS	6	Subsystem Live Fire Complete, Performed in System Demo (OCT 01)
Sensor	5	Subsystem Live Fire Complete, Not Validated in System Demo
Warhead/Fuze	3	Not part of Exit Criteria, studies performed

PGMM ATD Design Assessed at TRL 5

PGMM Technical Approach

- Sensor

- Subsystem Testing Completed (Hi-G)
- Integrated Performance Not Completed
- Demonstrate SAL Seeker in Demo Fire

- Control Actuation System (CAS) (Fins, Motors & Electronics)

- Integrated Performance Demonstrated in Live fire

- Guidance & Electronics Package:

- Integrated Performance Demonstrated in Live fire

- Airframe (Deployable Wings):

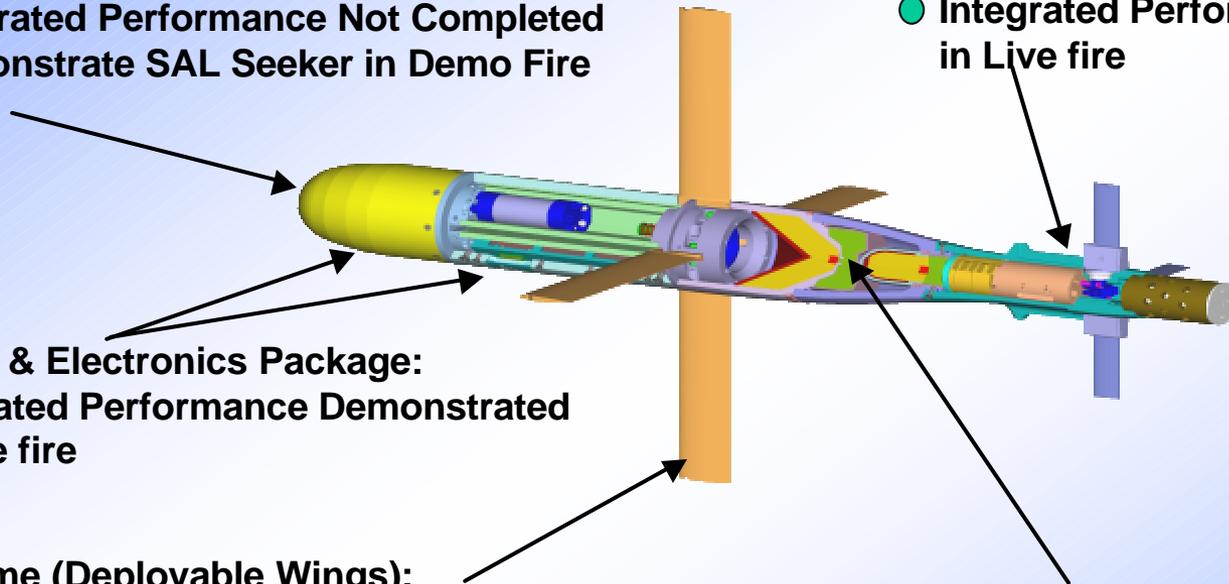
- Integrated Performance Demonstrated in Live fire

- Warhead/Fuze:

- Initial Assessment Identifies Existing Mortar Qualified Sub Components to Meet Block 1 Requirements:
- Point Detonating (PD) Fuze
- PAX Family of Unitary Explosives

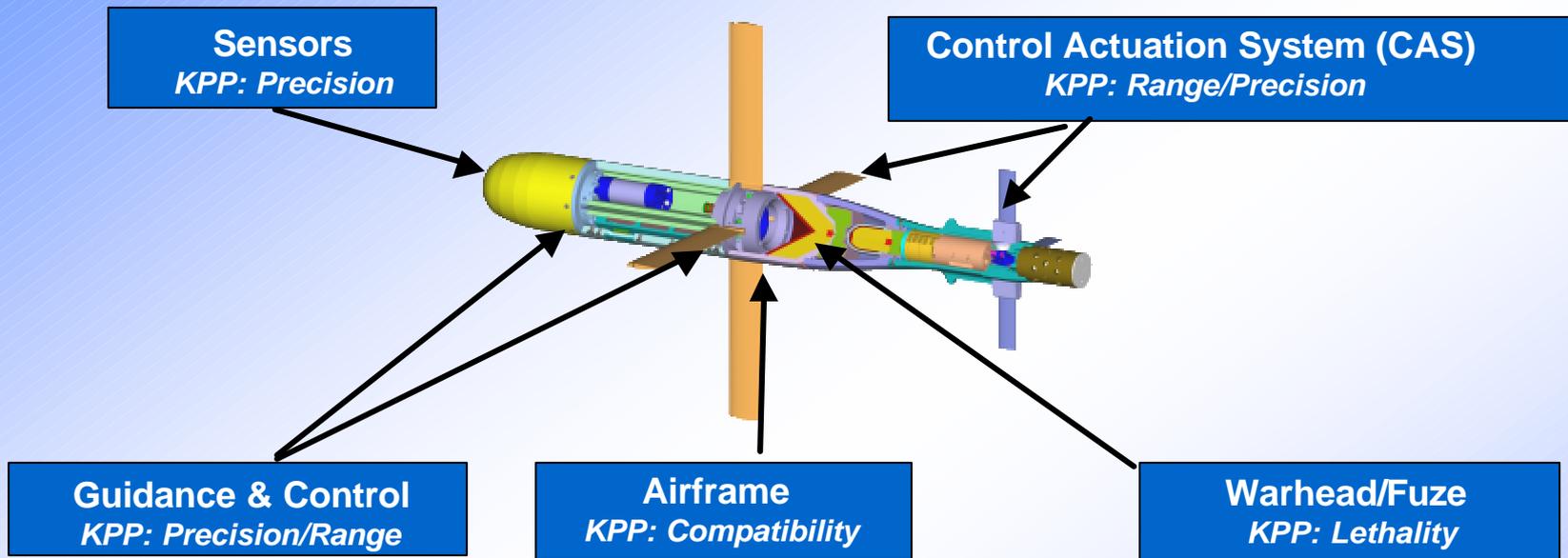
Key:

- Completed through Form, Fit & Function
- Not Completed (less than TRL 6)



**Mature Design on Demonstrated Components,
Integrate Existing Hardware/Materials**

Commonality Leverage



Current DOD Program/Product	Common Components	Application	Life Cycle Phase	Leverage Potential
Excalibur	CAS, G&C Airframe	155mm Howitzer	SDD	Direct
TERM	Sensors, CAS, G&C	120mm Tank	S&T	Direct
ERGM	CAS, G&C, Airframe	5" Navy Gun	SDD	Direct
TCM	CAS, G&C, Airframe	155mm Howitzer	S&T	Indirect
ER-DPICM	Airframe	120mm Mortar	S&T	Direct
Hellfire/Javelin	Airframe, Warhead	Missile	SDD/PAA	Indirect

Direct: Common Components Indirect: Similar Components; Learning Curve Acceleration

