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25 x 59mm LW25 Programmable Air Burst Munition

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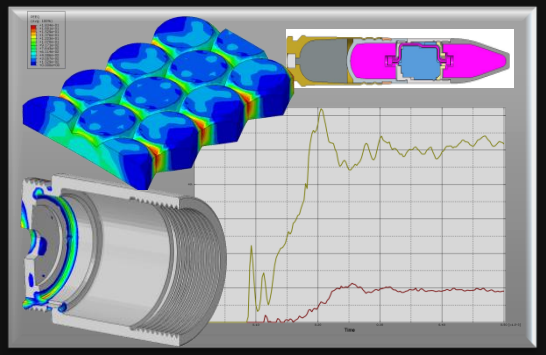
ATK's Lightweight 25mm Bushmaster Chain Gun on Palletized Autonomous Weapon System (PAWS)

LW25 PABM Project

Leverage ATK's PABM (Programmable Air Burst Munition) experience across multiple calibers to develop 25 x 59mm LW25 PABM ammunition. Develop and demonstrate a scalable common fuze for airburst munitions capable of integration into 25mm and larger cartridges.



Design

- ☑ Requirements Development and Management
- ☑ Trade Studies
- ☑ Design for production
- ☑ Lethality Modeling
- ☑ Gun Integration
- ☑ Analysis & Modeling
- ☑ Preliminary Design Review

PHASE COMPLETED

Build & Verification Testing

- ☑ Design Verification
  - ☑ Lab Test
  - ☑ Warhead Evaluation
  - ☑ Softcatch Testing
  - ☑ Integrate System Test
    - Airburst Test

COMPLETE 2011

Qualification

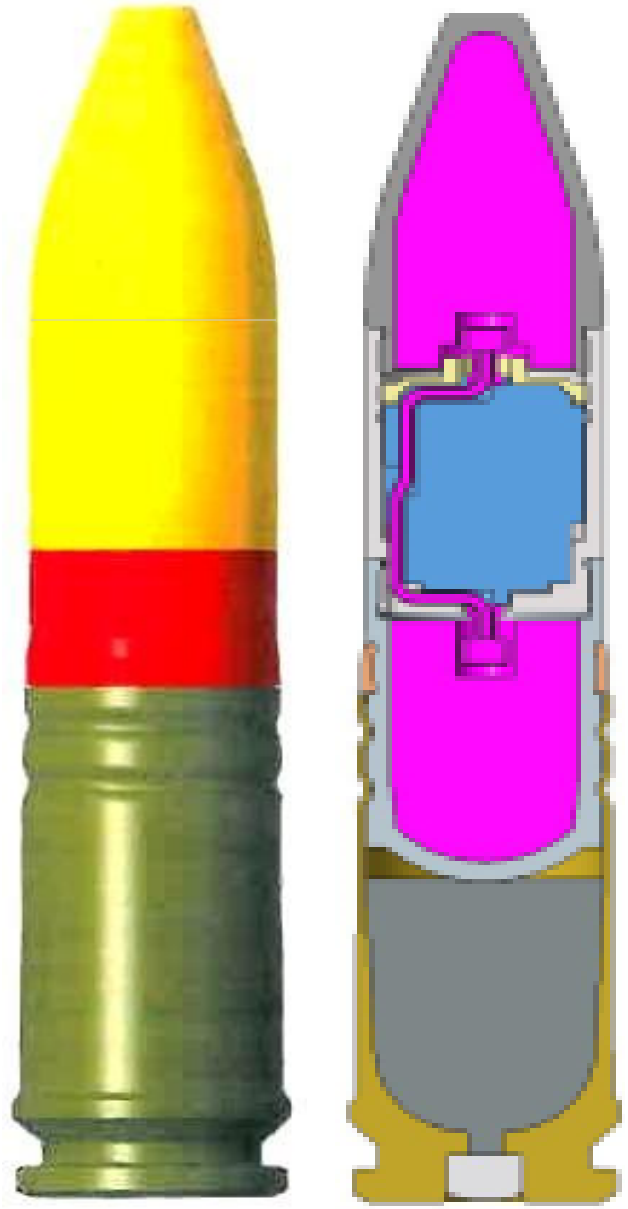
- Safety Testing
- Arena Testing
- Environmental Testing
- Performance Testing

COMPLETE 2011/2012

☑ = Complete

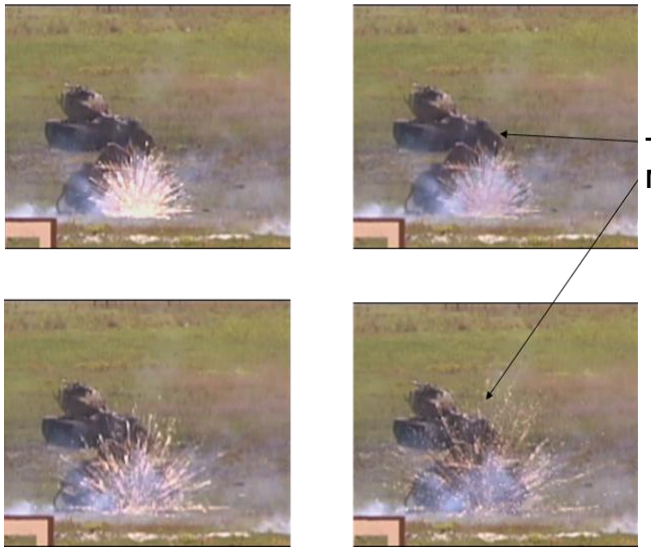
LW25 PABM Cartridge Overview

- Initial design concepts included base fuze, mid-body fuze, and nose fuze airburst projectiles
- Trade study completed which reviewed key aspects of the design such as Cost, Producibility, and Performance/Lethality to down select to mid-body fuzed projectile
- Emphasis on modeling and analysis to reduce risk and time to market. Tools such as Pro-E, PRODAS, ANSYS, CTH, and Matrix Evaluator were used
- The final design incorporates ATK's common/scalable medium caliber airburst fuze
- Lethality optimized through use of controlled fragmenting dual warheads; projectile is highly effective against defilade targets
- Common LW25 projectile profile and cartridge case components
- Inductive programming that is common with ATK's 30mm PABM-T Mk310; reliable and simple to integrate.



LW25 PABM Requirements Summary

- **Programmable modes** – Airburst, Point Detonate (PD), PD-delay (PD-D)
- **Backup Mode –** In the event of no communication or improper communication with the fuze setter, the fuze shall default to the PD mode
- **No-Arm Distance** – 35 meters
- **All-Arm Distance** – 50 meters
- **Self-Destruct** – 6.25 +1.0/-0.0 seconds
- **Muzzle Velocity** – 436 m/sec (mean)
- **Airburst Range** – 2,000 meters (Objective)
- **PD and PD-D Range** – 2,000 meters (Objective)
- **PD Sensitivity (min)** – 0.063” thick aluminum plate
- **Safety**:
  - MIL-STD-1316 compliant S&A – Mechanical setback lock and spin lock
  - Electronic spin rate test
  - Environmentally induced power source with Mechanical lock
- **Producibility** – modular fuze and common production process with 30mm and IAWS (25mm)



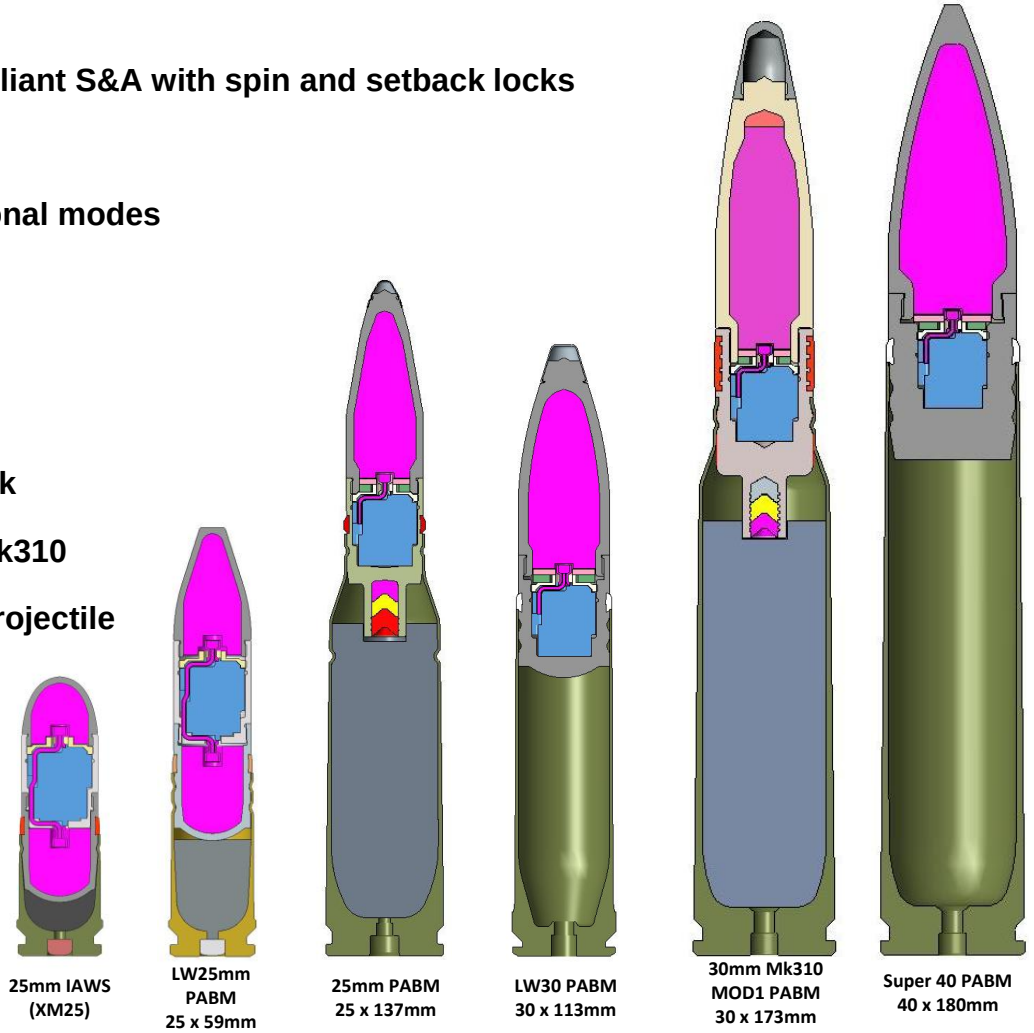
Example of 25mm Air Burst Function

Requirements are flexible and can be adjusted during development to meet user specific requirements

LW25 PABM Fuze – Scalable Airburst Fuze

- Demonstrated to survive setback loads up to 100kg's for LW25 application
- Turns count range estimation – option to upgrade to hybrid turns/time estimation
- Command arm electro-mechanical fuze
- Safety – Out-of-line safe MIL-STD-1316 compliant S&A with spin and setback locks
- Airburst, PD, PD-D modes of operation
- Quick-arm compatible, expandable to additional modes
- Environmentally induced power
- Defaults to PD backup with no programming
- Self-neutralization and self-destruct features
- Designed for production – Modular fuze stack
- Inductively programmable – common with Mk310
- Integrates into aft, mid, or forward body of projectile

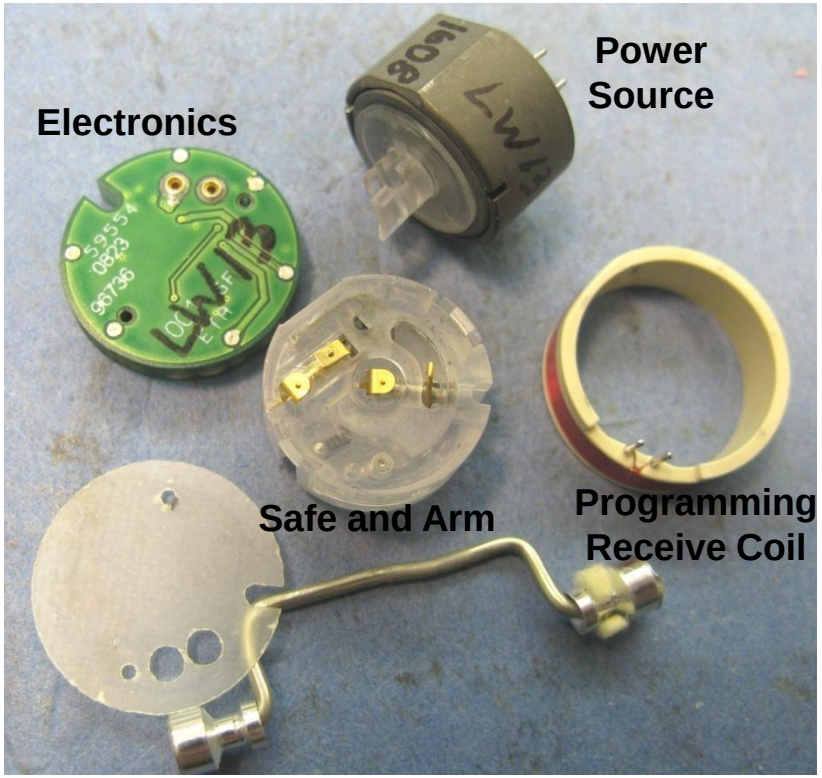
Scalable Airburst Fuze for Mid-body Projectile



Scalable Airburst Fuze Components

Mid-body Airburst Projectile Components

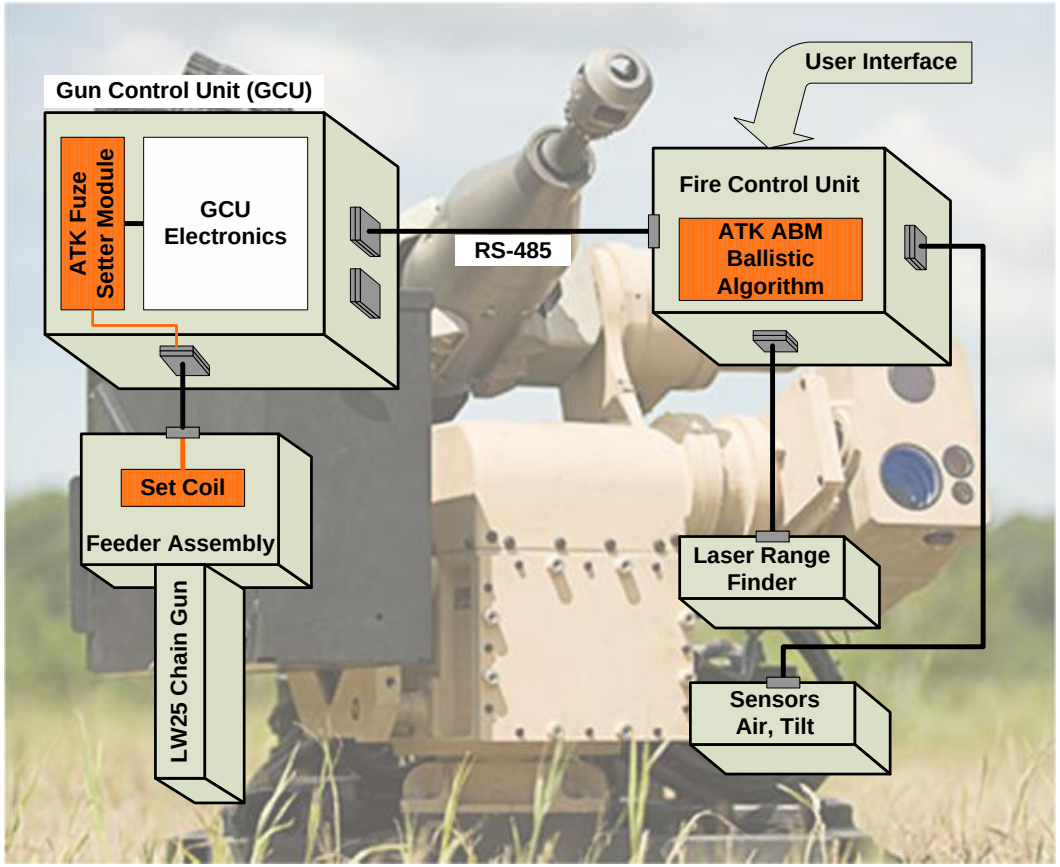
Scalable Airburst Fuze Components for Mid-body Projectile

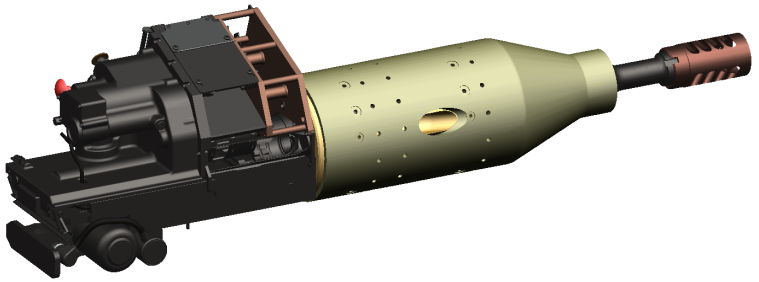


System Description

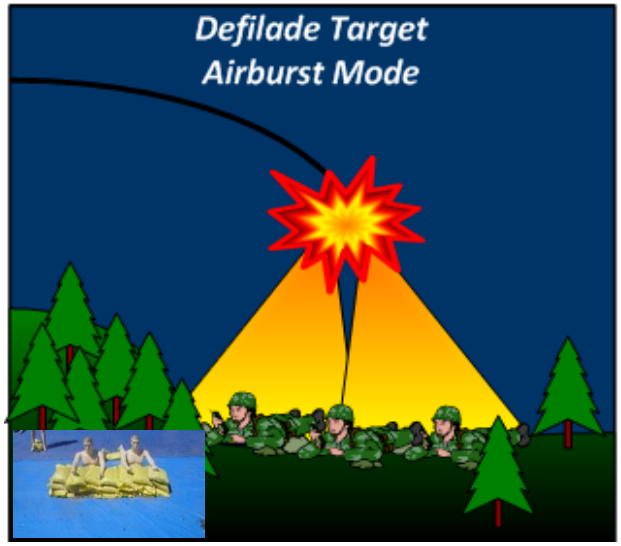
The following components comprise a typical LW25 PABM System:

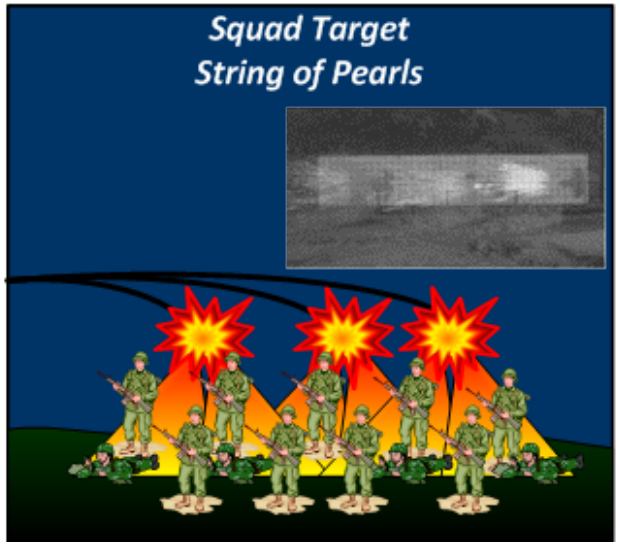
- PAWS
- LW25 Chain Gun
- Gun Control Unit (GCU)
- Fire Control
- Laser rangefinder
- Sensors for air temperature and pressure
- Gunner display to assist and confirm target aiming

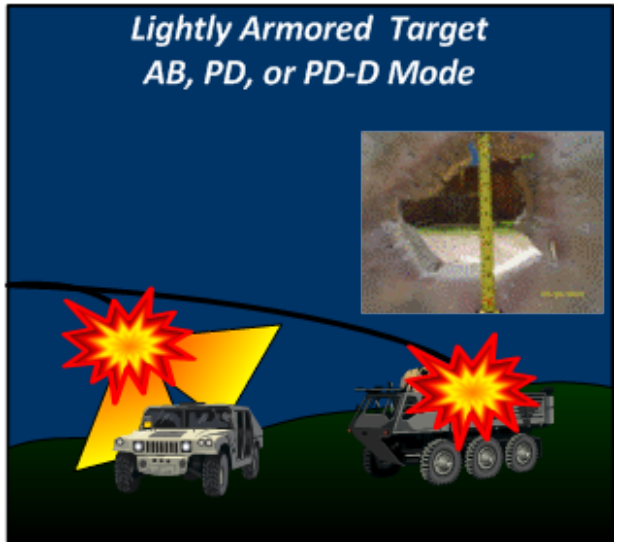




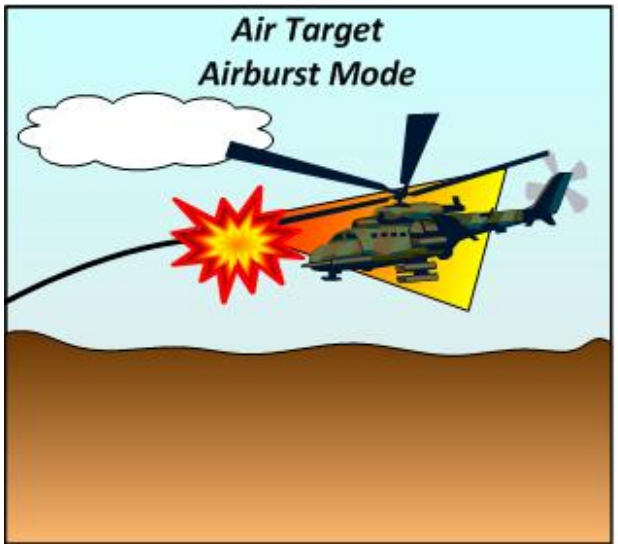
Ammunition Modes and Capabilities

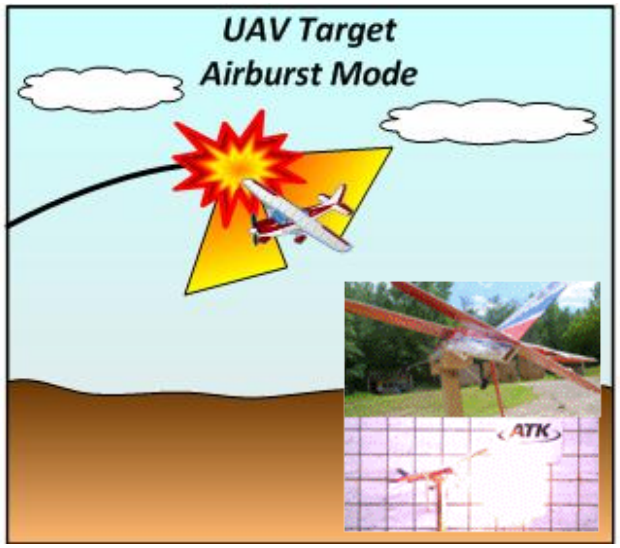


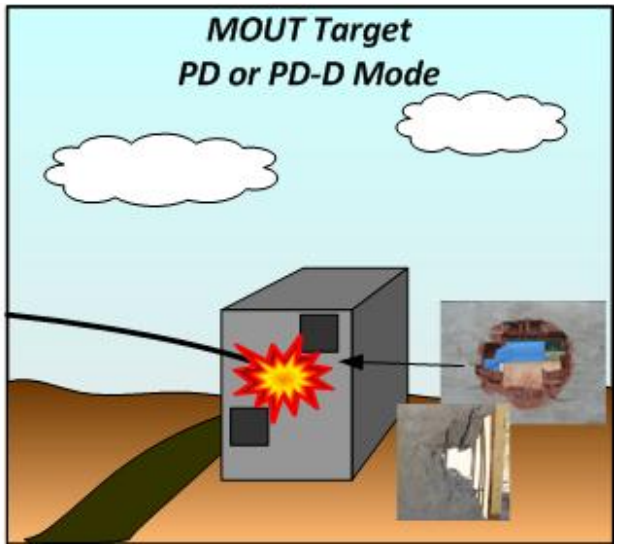




AIRBURST FUZING = OPERATIONAL VERSATILITY
PERFORMANCE AGAINST DEFILADE AND BEHIND WALL TARGETS







Summary

- **ATK has developed and demonstrated a common scalable PABM fuze which can be easily integrated across the medium caliber family of ammunition.**
- **Using precision fuzing and controlled fragmentation, the LW25 PABM offers a significant performance increase over conventional ammunition when engaging:**
  - Targets in defilade position
  - Area targets – squad formations
  - Light armor
  - Light skin targets
  - Air targets – such as UAV's and helicopters

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