

# Cannon Artillery and Mortar Precision Effects



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"The presentation to the effect that disclosure of information does not imply any specific intent or commitment on the part of the U.S. to provide further information on the topic."



# What Level of Precision is Needed?

## Area Munition

120m Radius Circle



Open Area

## Area Precision Munition



50m Radius Circle

Sparsely-Packed Urban

- Urban Density Can Vary Widely Over Small Distances Between Terrain Elements
- Munitions with Varying Levels of Precision May Be Most Cost-Effective

Cultural Area

Densely-Packed Urban

Precision Guided Munition

10m Radius Circle





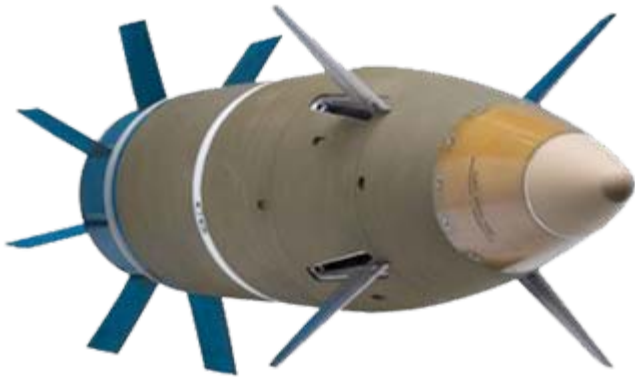
# Cannon Artillery and Mortar Precision Effects Capabilities



- All weather 24/7 continuously “loitering” precision capability
  - ✓ Responsively and precisely attack targets... can precisely “mass” fires
  - ✓ Minimizes collateral damage... “discretion” & “close” engagements
  - ✓ Inherent scalability with multiple shooters and multi-round missions
  - ✓ Dramatically reduced logistics burdens (less qtys and transport/storage)
  
- Employed with current cannon artillery & mortar systems and structure... & accurate targeting systems (FS3, LLDR, PSS-SOF)
  - ✓ Easily additive to current systems and capabilities... “compatibility” is key
  - ✓ Maintains current Smoke & Illum capabilities
  - ✓ Maintains area fire & suppressive fires capabilities... “precise” area fires?

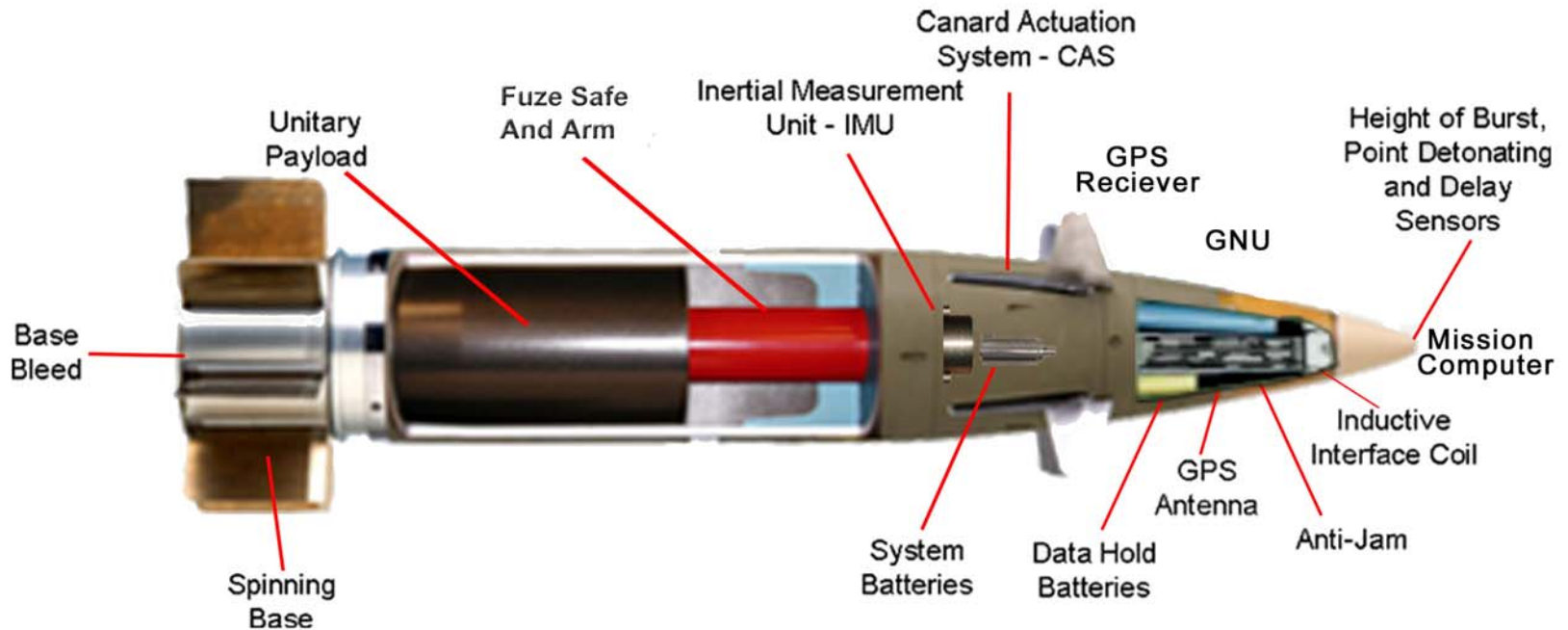


# XM982 Excalibur



## System Characteristics/Description:

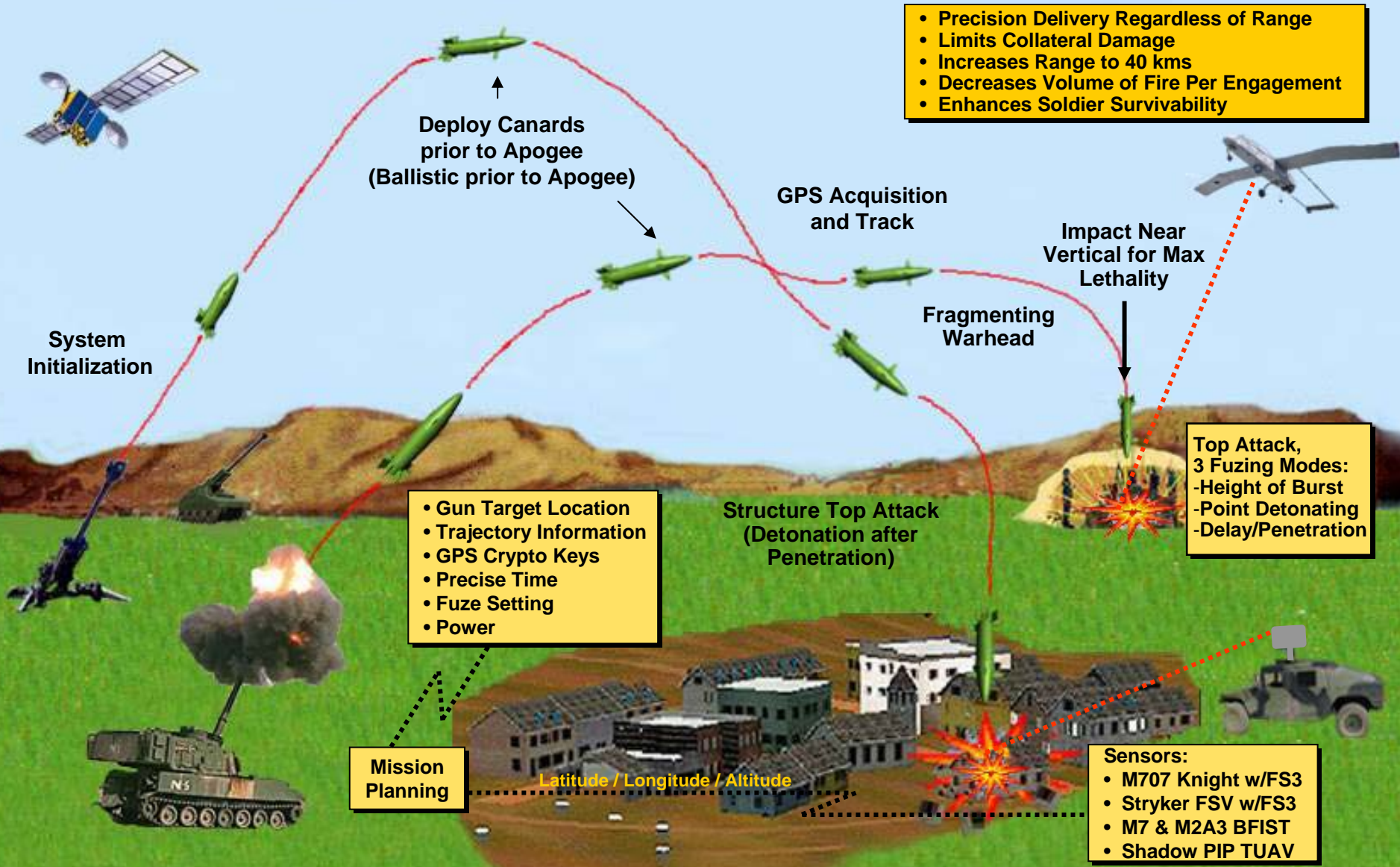
- ✓ Precision Guided 155mm Cannon Ammunition (CEP < 10m)
- ✓ Fin Stabilized, Gliding Air Frame
- ✓ All Weather, Day/Night, Fire & Forget, Urban/Complex Terrain
- ✓ Compatible with NLOS-C, Paladin and LW155 Howitzer Platforms
- ✓ One Meter Length / 106 lb







# Excalibur Concept of Operations



- Precision Delivery Regardless of Range
- Limits Collateral Damage
- Increases Range to 40 kms
- Decreases Volume of Fire Per Engagement
- Enhances Soldier Survivability

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

- Top Attack, 3 Fuzing Modes:
- Height of Burst
  - Point Detonating
  - Delay/Penetration

Mission Planning

Latitude / Longitude / Altitude

- Sensors:
- M707 Knight w/FS3
  - Stryker FSV w/FS3
  - M7 & M2A3 BFIST
  - Shadow PIP TUAV



# Excalibur Video

PRECISION STRIKE  
XM982  
**EXCALIBUR**  
FOR GUNNERS AT WILL

**EXCALIBUR M982  
155MM ARTILLERY  
PRECISION PROJECTILE**

The image shows a video frame with a dark brown grid background. At the top, there is a horizontal strip with a fiery, orange and yellow background. On the left side of this strip is the Excalibur logo, which is an oval containing the text "PRECISION STRIKE", "XM982", "EXCALIBUR", and "FOR GUNNERS AT WILL". To the right of the logo is a 3D rendering of the Excalibur M982 155mm artillery precision projectile, shown from a side-on perspective. Below the strip, the text "EXCALIBUR M982 155MM ARTILLERY PRECISION PROJECTILE" is displayed in a bold, yellow, sans-serif font.



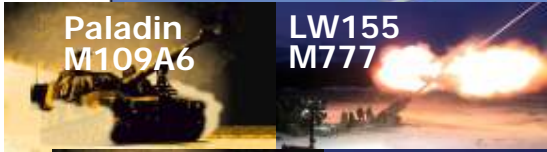
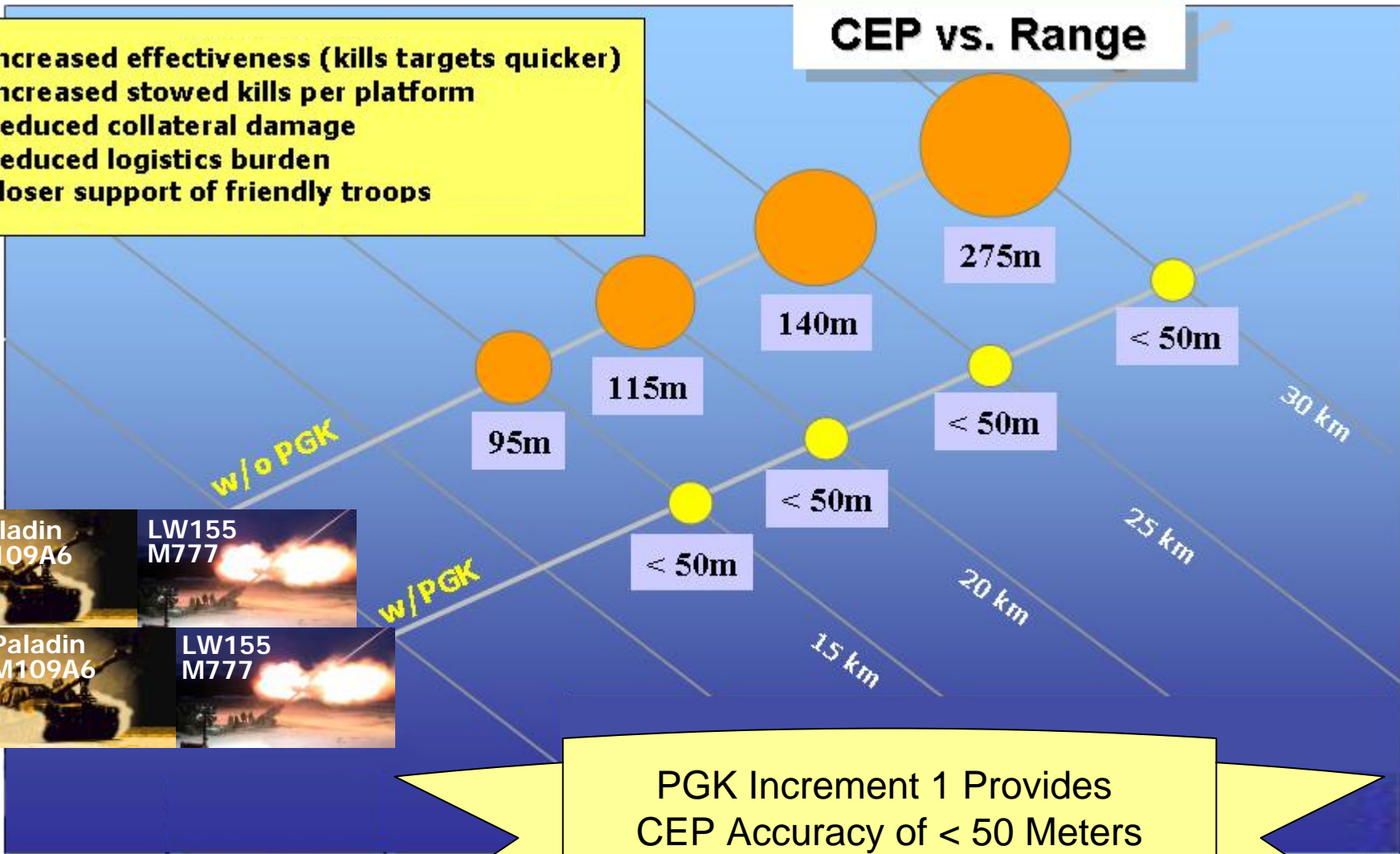


# Precision Guidance Kit (PGK) 155mm Projectile Accuracy



- Increased effectiveness (kills targets quicker)
- Increased stowed kills per platform
- Reduced collateral damage
- Reduced logistics burden
- Closer support of friendly troops

### CEP vs. Range



PGK Increment 1 Provides CEP Accuracy of < 50 Meters



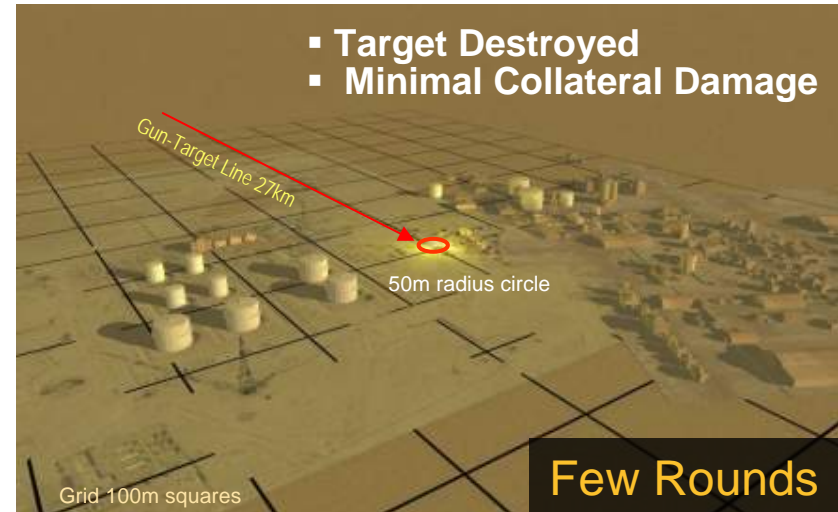
# Operational Benefits



Today's Capability: 183m CEP\*



PGK:  $\leq 50m$  CEP



\* M109A6 (Paladin) at 27km: 155mm (HE) M549A1

- Improves Accuracy – Significantly Reduces Ballistic Dispersion
- Significantly Decreases the Time Needed to Achieve Desired effects
- Minimizes Collateral Damage and Enables Closer Support to Friendly Troops
- Increases Number of Kills per Basic Load of Ammunition
- Greatly Reduces Logistics Burdens





# PGK Design (Increment 1)



- Fits in standard 155mm High Explosive artillery projectile fuze wells (deep intrusion)
- GPS guidance (incorporates SAASM)
- 20 Year Storage Life (no battery)
- Proximity & Point Detonating Fuzing





# PGK Video





# Emerging Needs/ Future Requirements



- IBCT Organic Precision Requirements
  - ✓ 40 Plus IBCTs within Army structure...have mortars & 105mm
  - ✓ PGK-2 is funded...implemented with 105mm digitization
  - ✓ Need for organic very responsive precision with <10m CEP
  
- “Cheap” or “Very Affordable” Precision
  - ✓ Key technologies... GPS, Fuzing, Power, AJ, & SALs
  - ✓ ARDEC/ARL CRADA efforts to mature components and integrated concepts...applicable to artillery and mortars
  - ✓ Several Industry efforts ongoing...will enable competition
  - ✓ Wider use in training...confidence, proficiency, and quantities

**Is Very Affordable Precision “Coming Soon”?**