



NDIA Gun and Missile Systems Conference





April 24, 2007

Current Environment

- ✓ **US Army FM 3.0 – Operations**
- ✓ **Offense Operations**
- ✓ **Defensive Operations**
- ✓ **Stability Operations**
  - **"Army forces are trained, equipped, and organized to control land, populations, and situations for extended periods"**
  - **"These occur during combat operations and throughout the post-conflict period"**
  - **Apply force selectively and discriminately….precision munitions and non-lethal assets are vital.**

Precision Munitions

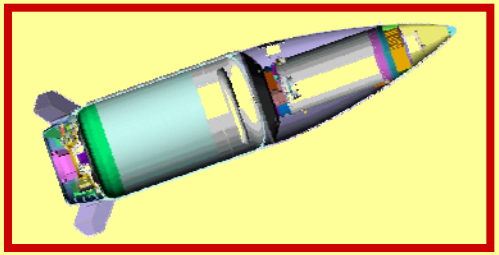
- **Supports COIN Ops**
- **Must have precision targeting**
- **Minimizes collateral damage**
- **24/7, All weather**

For the first time, the ground commander now has dedicated precision munitions that he can employ quickly and efficiently.

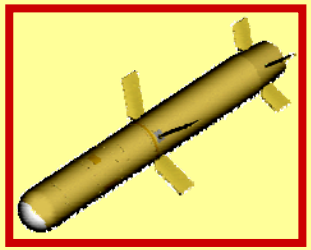
Precision Munitions

- **Rockets & Missiles**

Guided MLRS - Unitary



ATACMS Unitary



Precision Attack Munition

- **155 mm**

Excalibur

Precision Guidance Kit

- **Future Possibility - Precision 105mm**

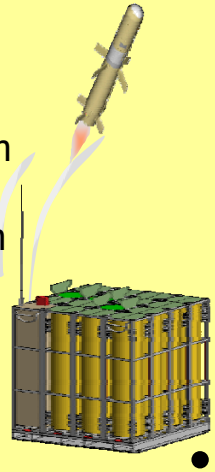
Rockets and Missiles

Guided MLRS Unitary

Combat Proven!

- **Range: 15-70+ Km**
- **Multi-Mode Fuze (PD,Delay,Proximity)**

Precision Attack Munition (PAM)



Non-Line of Sight Launch System (NLOS-LS)

- **Range: .5-40+ Km**
- **Grid Atk, SAL & Uncooled IR**
- **12-Pound Warhead**
- **Attacks Stationary/Moving Tgts**

Precision Munitions

GMLRS Unitary

Precision Munitions

GMLRS Unitary in Iraq

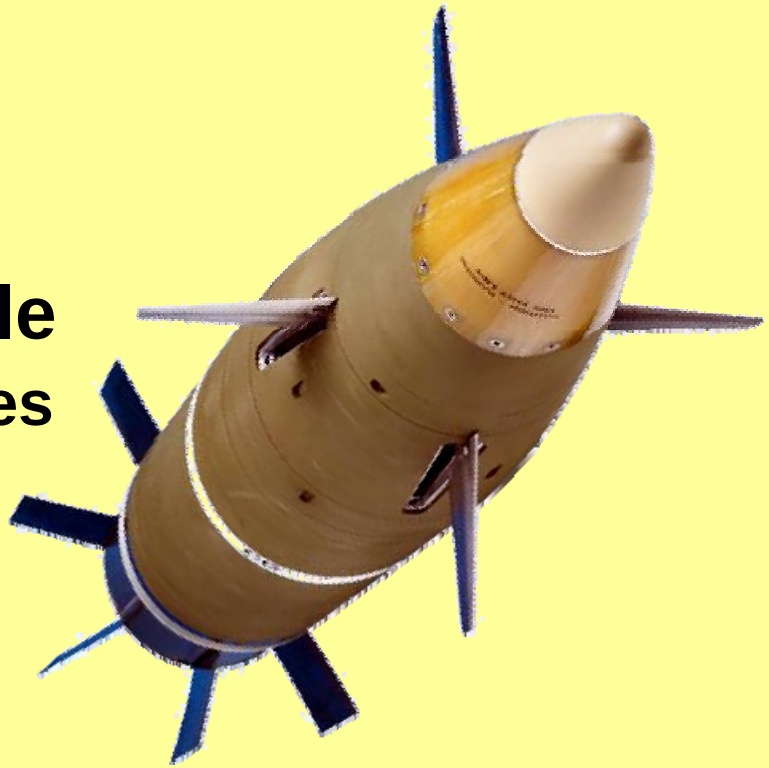
Precision Munitions

NLOS-LS (PAM)

Precision Munitions

Excalibur Characteristics & Capabilities

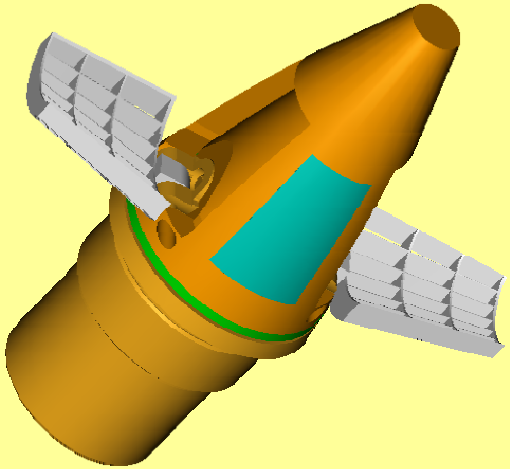
- **Range**
  - **7.5 km min range**
  - **Early fielding, 24km**
- **Near vertical terminal angle**
  - **Approximately 80-85 degrees**
- **10m CEP at all ranges**
- **GPS guided, IMU backup**
- **3 Fuze setting:**
  - **PD**
  - **Delay – up to 8 inches of reinforced concrete**
  - **Proximity HOB**



Precision Munitions
Excalibur

Precision Munitions

Precision Guidance Kit (PGK)



Mission

To enhance the accuracy of current and future 105mm & 155mm artillery projectiles.

Characteristics

- Backwards compatible with current munitions
- GPS 'guided' which provides location
- Cost effective by reducing delivery errors

Requirements

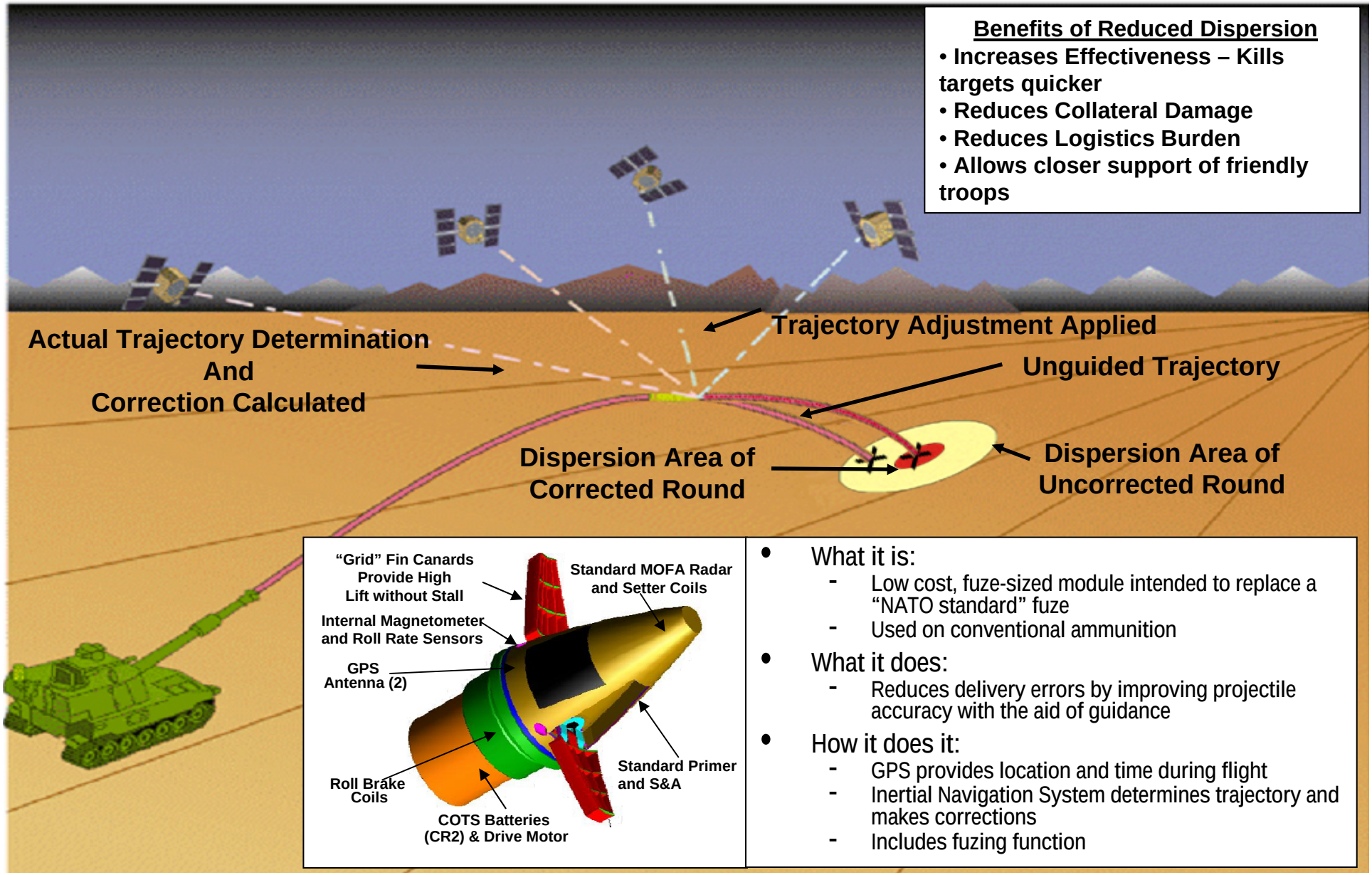
- CEP of less than 50m (T) and 10m (O).
- Four operational modes: super quick, delay, proximity, and electronic time
- Apr 06 – PM award Technology Development contracts
- 27 Mar- 6 Apr 07 – Shoot off and Contract Award

Precision Munitions

PGK Operational Concept

Benefits of Reduced Dispersion

- **Increases Effectiveness – Kills targets quicker**
- **Reduces Collateral Damage**
- **Reduces Logistics Burden**
- **Allows closer support of friendly troops**



- What it is:
  - Low cost, fuze-sized module intended to replace a "NATO standard" fuze
  - Used on conventional ammunition
- What it does:
  - Reduces delivery errors by improving projectile accuracy with the aid of guidance
- How it does it:
  - GPS provides location and time during flight
  - Inertial Navigation System determines trajectory and makes corrections
  - Includes fuzing function

Accurate Targeting

Joint Effects Targeting System

- "Born Joint" requirement
- Requirement of 10M TLE at 10KM
- Modular components

- *Common mounted*
- *Common dismounted*
- *< 25M TLE*
- *< 5M with PSS-SOF*

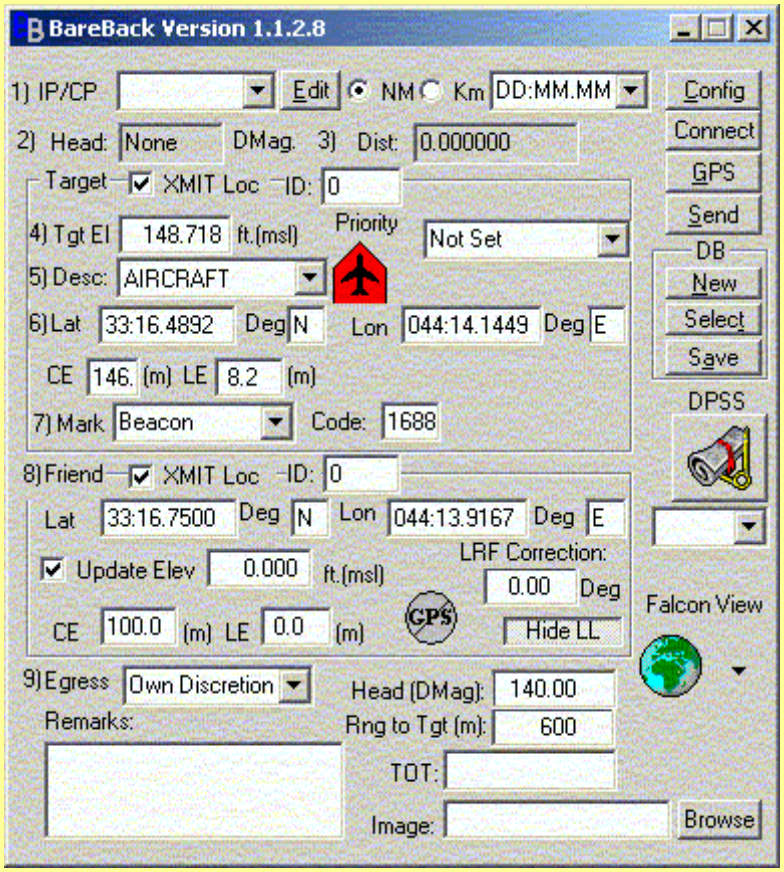
Light Weight Locator Designator Rangefinder

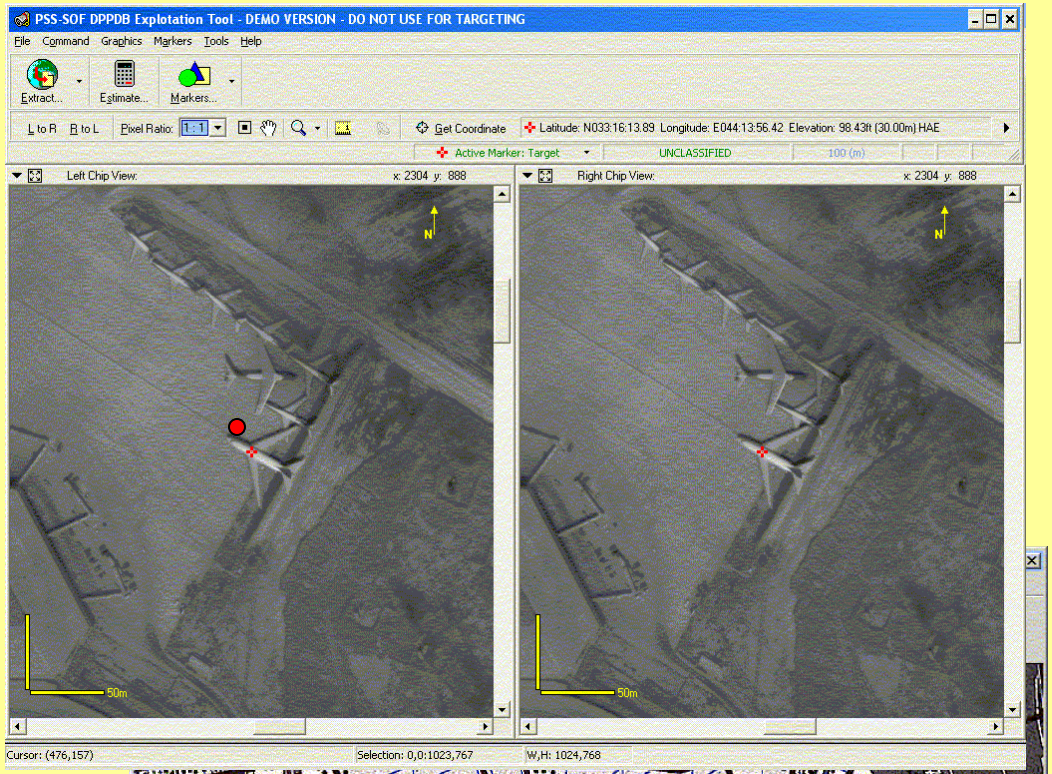
- Very large modular force requirement
- 40M TLE at 10KM
- Weight – 35 lbs

Fire Support Sensor System

- Our mounted answer
- 17M TLE at 10KM
- Converting to ASV
- Working BFIST integration
- Stabilized with CRS3

Precision Strike Suite
Special Operating Forces (PSS-SOF)



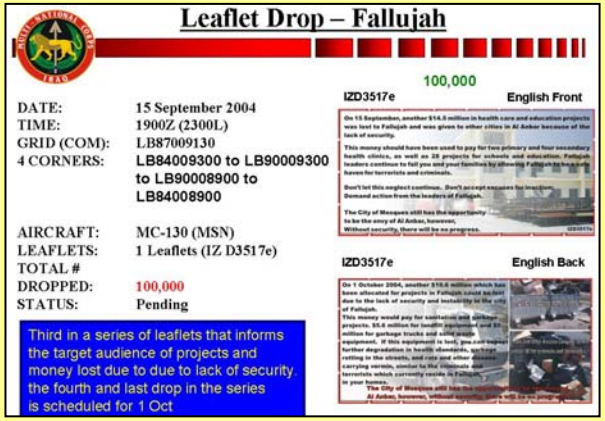


Non-lethal

- **Must maintain a full spectrum focus**
- **Beyond just delivery systems/munitions**
- **IO and EW key assets**
- **Includes full range of lethal and non-lethal assets**

Non-lethal

- **Information Operations (IO):**
  - **The employment of the core capabilities of Electronic Warfare, Computer Network Operations, Psychological Operations, Military Deception, and Operations Security, in Concert with Specified Supporting and related Capabilities, to affect or defend Information Systems, and to influence decision making. (FM 3-13, Information Operations Doctrine, TTP)**
- **Field Artillery Role**
  - **Designated Lead for Tactical IO**
  - **Tactical IO Course – Now taught at Field Artillery School**



Non-lethal

- **Electronic Warfare (EW) / Electronic Attack (EA)**
  - **Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. The three major subdivisions within electronic warfare are:**
    - **Electronic Attack**
    - **Electronic Protection**
    - **Electronic Warfare Support**

  - **(Joint Publication 3-51, Joint Doctrine for Electronic Warfare)**
- **Field Artillery Role**
  - **Designated as the U.S. Army EA Specified Lead for Corps and Below Army wide EA Requirements**
  - **Army Operational Electronic Warfare – Now taught at Field Artillery School**

Expeditionary Units with Campaign Capabilities

✓ Smaller, more capable units led by competent leaders

- Mix of delivery systems with access to full suite of sensors and munitions
- Systems designed to deploy and fight off the ramp
- Migrate tactical and technical fire direction to the lowest possible level with maximum feasible centralized control
- Develop multifaceted observers in appropriate numbers with technical enhancements
- Smaller, lighter systems and units capable of integrating and operating with maneuver units without loss of capability

✓ Increased survivability and system reliability

- Enhanced vehicle and crew protection – auto reload under armor
- Same mobility and vehicle signature as supported maneuver
- On-board Prognostics, early fault warning and troubleshooting

✓ Organized for sustained operations

- Fires Brigades and BCT Fires Battalions operate for up to 72 hours without resupply

Expeditionary Units with Campaign Capabilities

High Mobility Artillery Rocket System (HIMARS)

[redacted]

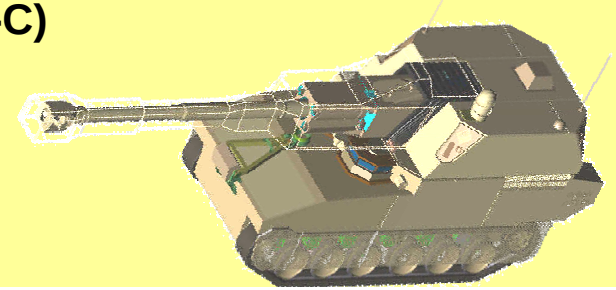
NLOS-Cannon

Characteristics

- MRSI And Direct Fire Capable
- Precision Munitions Capable
- Integrated Projectile Tracking System
- 2-man Crew, 2 in Ammo Carrier
- 24 Projectiles And 72 Propellant Increments Capacity (155mm)

Requirements

- Maximum Range: 30 km (26km w M549, 32km w/ Excalibur)
- Minimum Range: 4 km
- Rate of Fire: 6 Rnds/Min (Sustained)
- Main Armament: Zone 4 - 38 Calibers Long 155mm
- Rearm: 15 min
- Munitions: All current and developmental munitions of it's caliber
- Responsiveness: Emplaced-20 sec; Moving-30 sec.
- Deployability: C-130 Emergency Only (One NLOS-C)

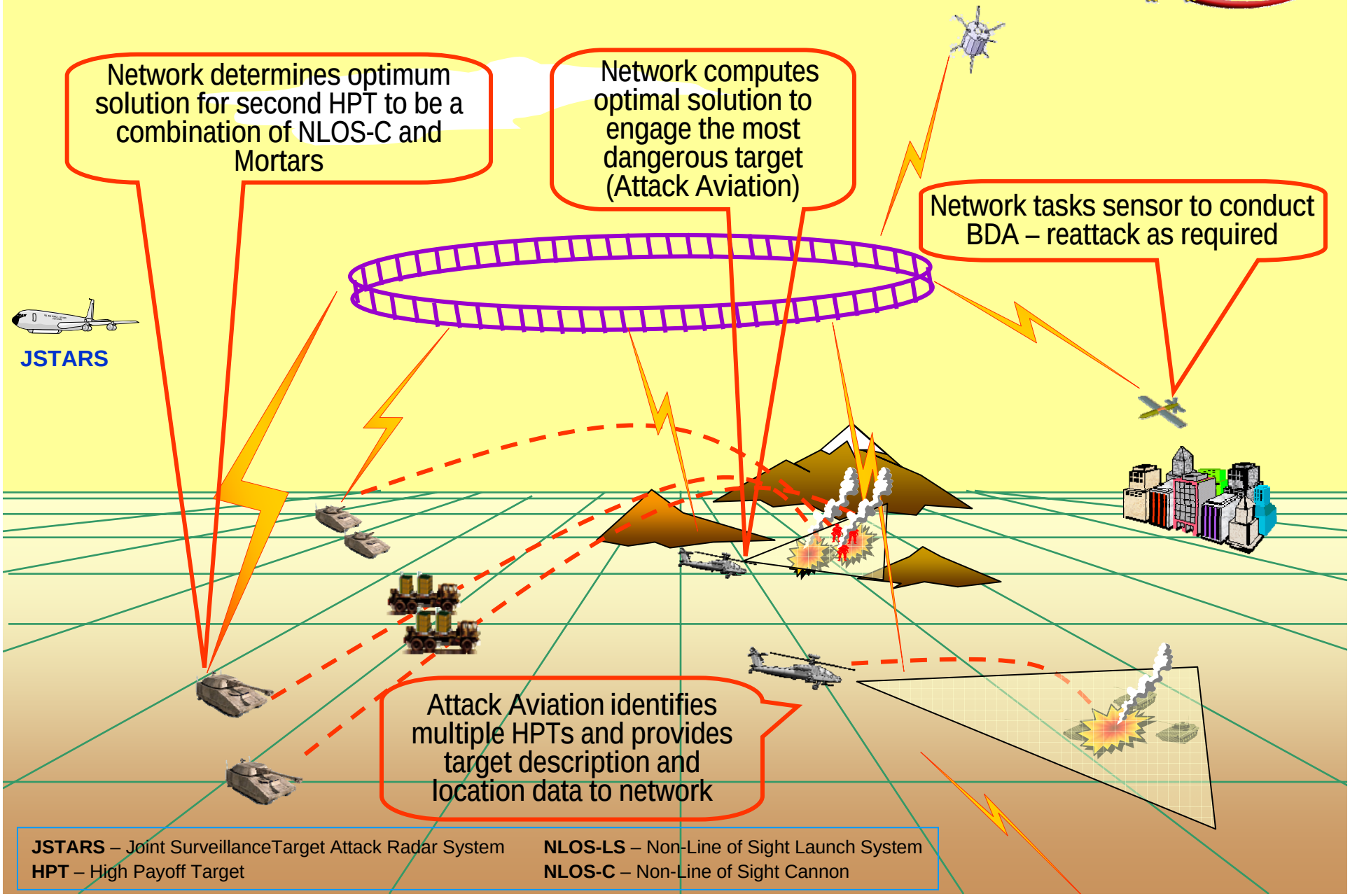


NLOS-Cannon

Fully Networked Battle Command

- ✓ Joint network connectivity from space to mud
  - Robust, multi-form communications with routine network linkage
  - Network-based point and click targeting
- ✓ A single battle command system
  - Seamless exchange of information via common software
  - Universal user access to system capabilities
  - Point and click interface with embedded help and training
- ✓ Enhanced situational awareness
  - Every Soldier and platform integrated into a tailorable common operating picture at every echelon
  - Identification of friendly, enemy and non-combatants
  - Unified fires deconfliction process

Fully Networked Fires



JSTARS – Joint SurveillanceTarget Attack Radar System
HPT – High Payoff Target
NLOS-LS – Non-Line of Sight Launch System
NLOS-C – Non-Line of Sight Cannon

C-RAM

- ***Counter-Rocket Artillery Mortar***
  - ***System of systems to counter the indirect fire threat***
  - ***7 Pillars***
    - ***Shape, Sense, Warn, Protect, Intercept, C2, Respond***
- ***Successful in Theater and at NTC***