Naval Surface Fire Support

NSFS Overview Brief
to
NDIA Indirect Fire Panel

PROGRAM MANAGER:

Mr. Jim Ripley

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MISSION STATEMENT: ***"We design, build, modernize, and provide life-cycle support to gun, missile, and control systems that allow our surface combatants to provide responsive, lethal, and flexible fires to the land warriors."***

MNS NSFS Requirements

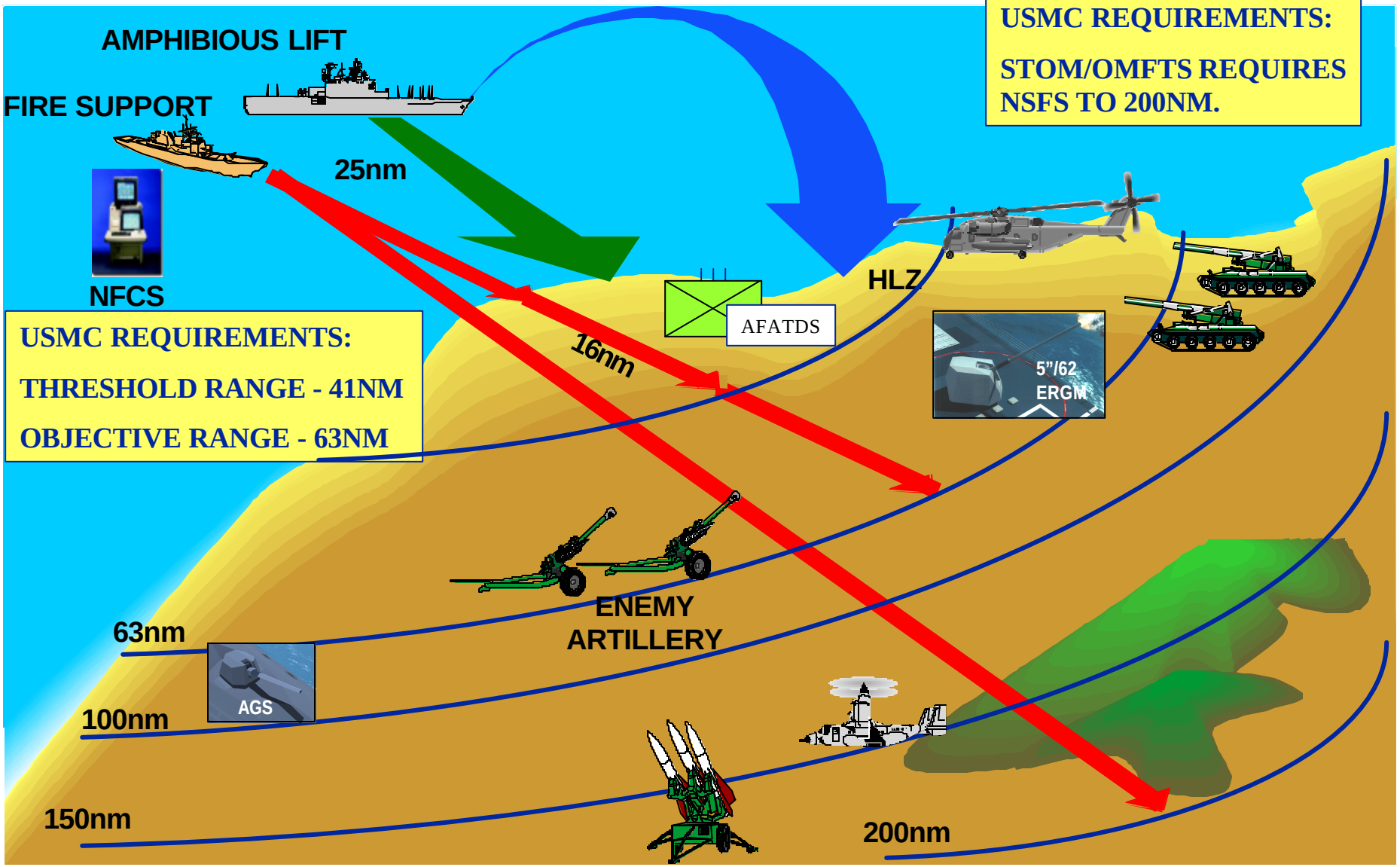
- **NSFS MNS Approved May 1992**
  - **Requirement "for a combination of guns, rockets and missiles with sufficient range, accuracy and lethality to meet the wide range of requirements in support of NSFS, Amphibious Operations and the Joint Land Battle."**

NSFS Objectives:

- To provide supporting fire for amphibious assaults, raids, demonstrations or withdrawals.
- To provide suppression and/or destruction of hostile anti-shipping weapons and air defense systems.
- To delay and disrupt enemy movement and reinforcement of defending forces.

Kill of enemy reinforcements will be of primary importance.

NSFS Requirements



Army / Navy Common Projectile Strategy & Enablers

Other Potential Commonality

- Testing & Evaluation
- FMS
- Security Classification Guide
- Configuration Management
- Procurement / Competition
- Risk Management
- Technology Refresh
- CONOPS / TLE's / TTPs
- Shipping Container

Potential Payload Commonality

- Warhead
- Actuators
- Unitary Payload
- Height-of-Burst (HOB) Sensor
- Energetics
- Safe & Arm

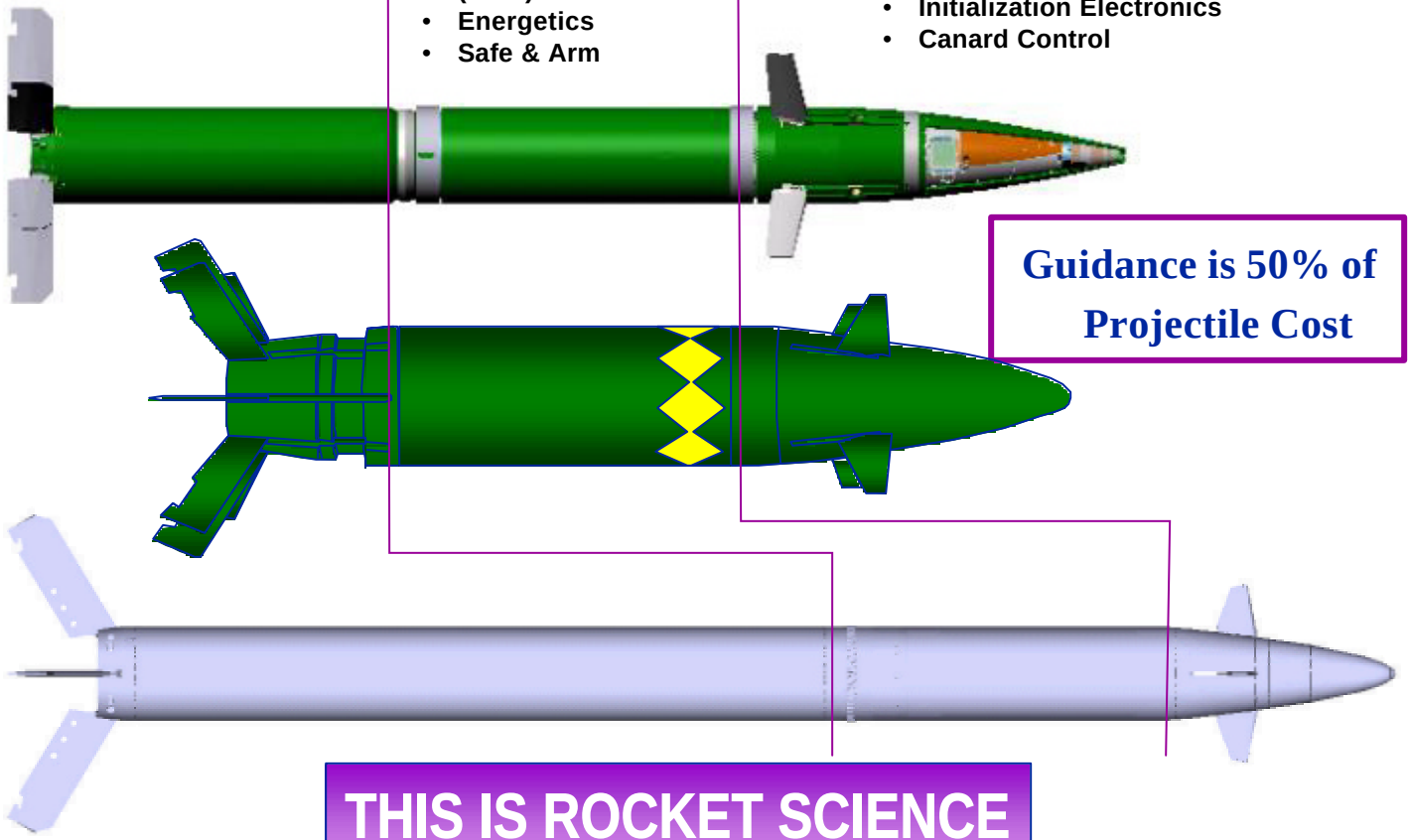
Potential Front End Commonality

- GPS Electronics
- IMU Electronics
- Power Supply
- Mission Computer
- Flight Software
- Anti-Jam Electronics
- Initialization Electronics
- Canard Control

5" ERGM*

155mm Excalibur*

155mm LRLAP*

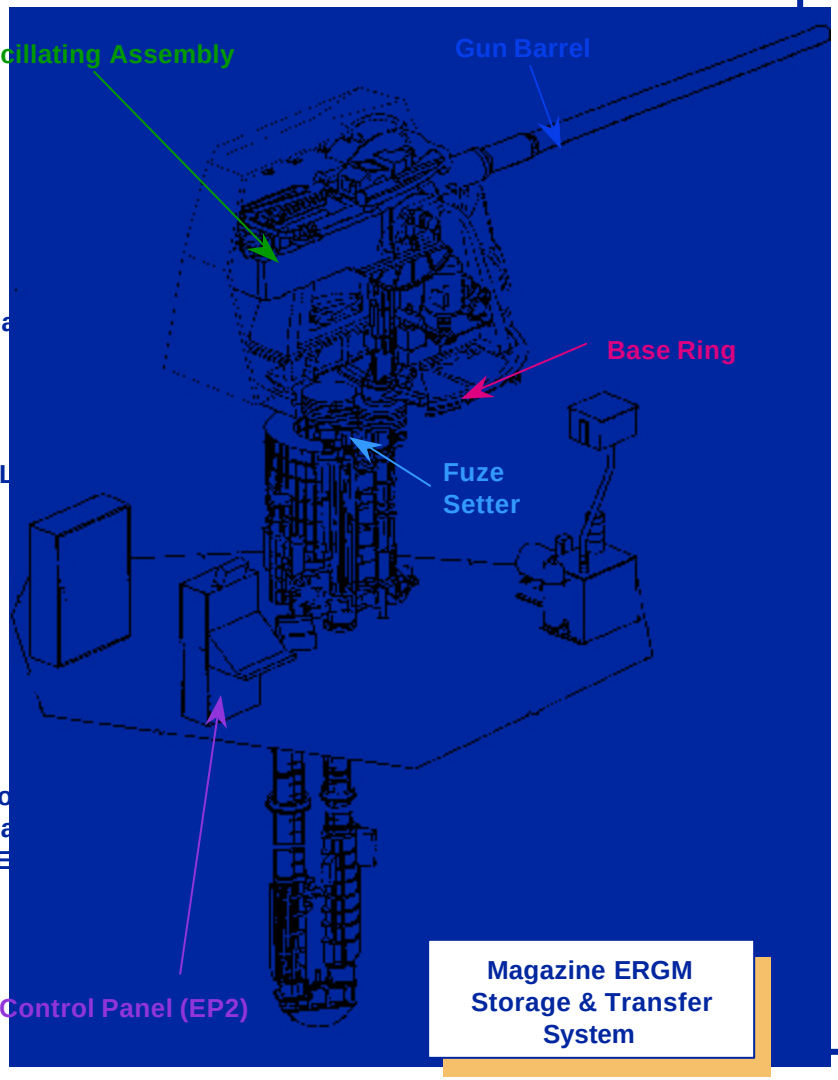


Guidance is 50% of Projectile Cost

*Not To Scale

THIS IS ROCKET SCIENCE

High Energy Launch System
NSFS MK 45 Mod 4 Modifications



Gun Barrel:

Lengthen to 62 calibers,
Increase service pressure from 55 to 65 kpsi
Increase Energy from 10MJ to 18MJ with new propellant charge

Oscillating Assembly:

Increase recoil stroke
Strengthen gun barrel housing
Incorporate multi-lug breech
New breech open/extractor control mechanism

Base Ring:

Incorporate stronger material

Fuze Setter:

Additional fuzesetter for ERGM data

EP2 Panel:

Incorporate digital control
Incorporate ERGM interfaces

New Empty Case Tray:

Redesign for longer recoil stroke

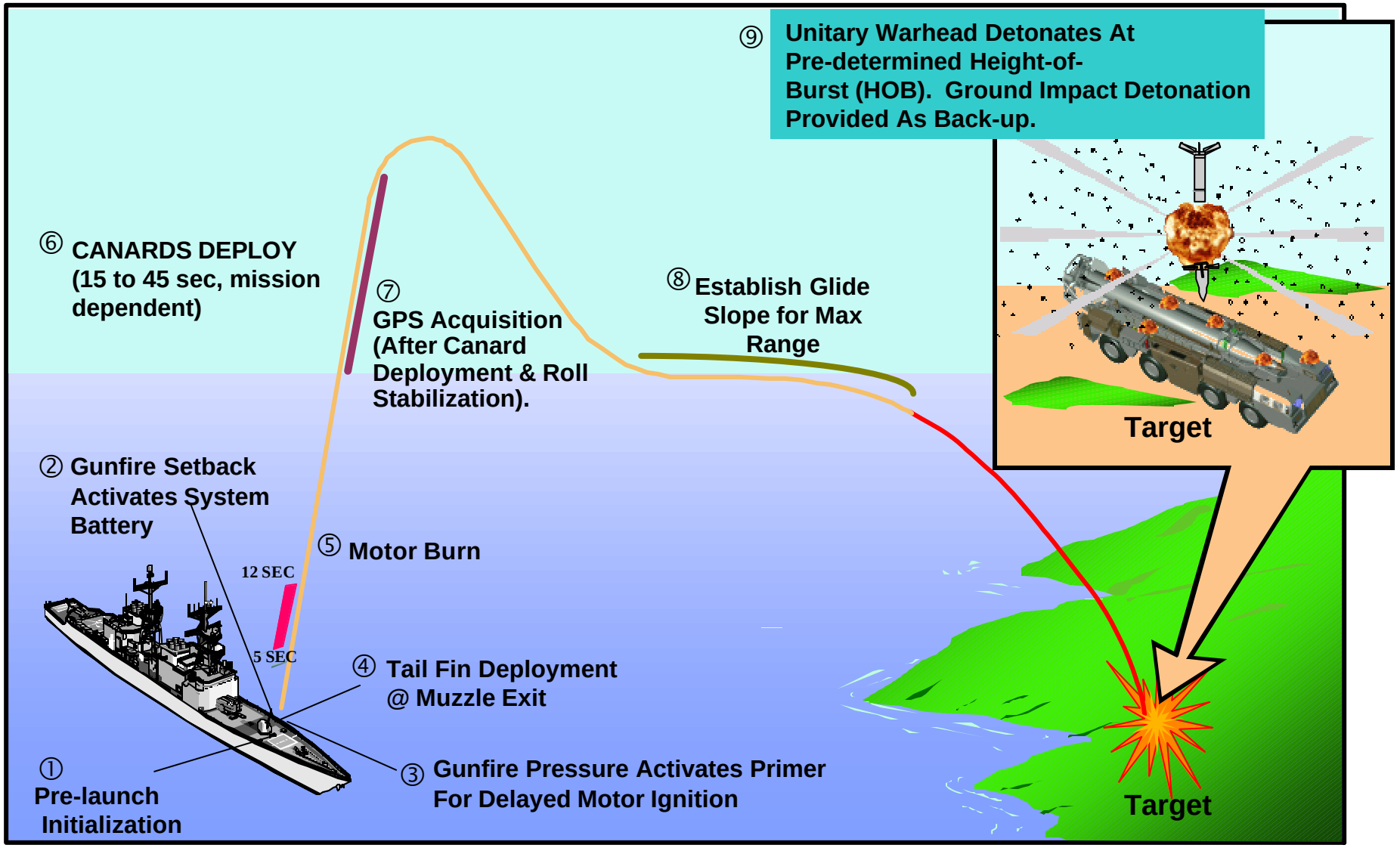
Modified Upper Hydraulics:

Accommodate changes to recoil system

Elevation Drive:

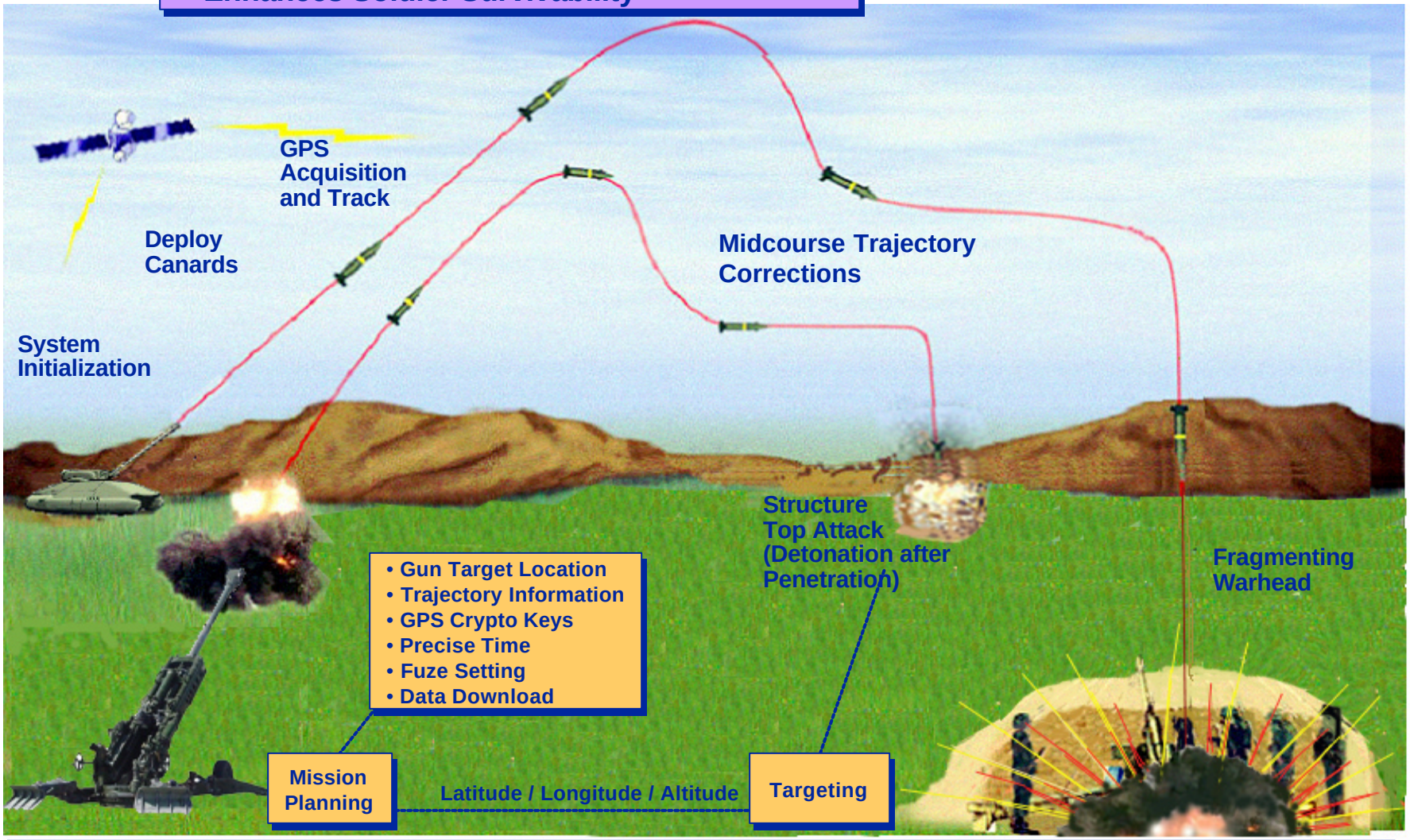
Increased power to maintain current standards

ERGM Flight Sequence



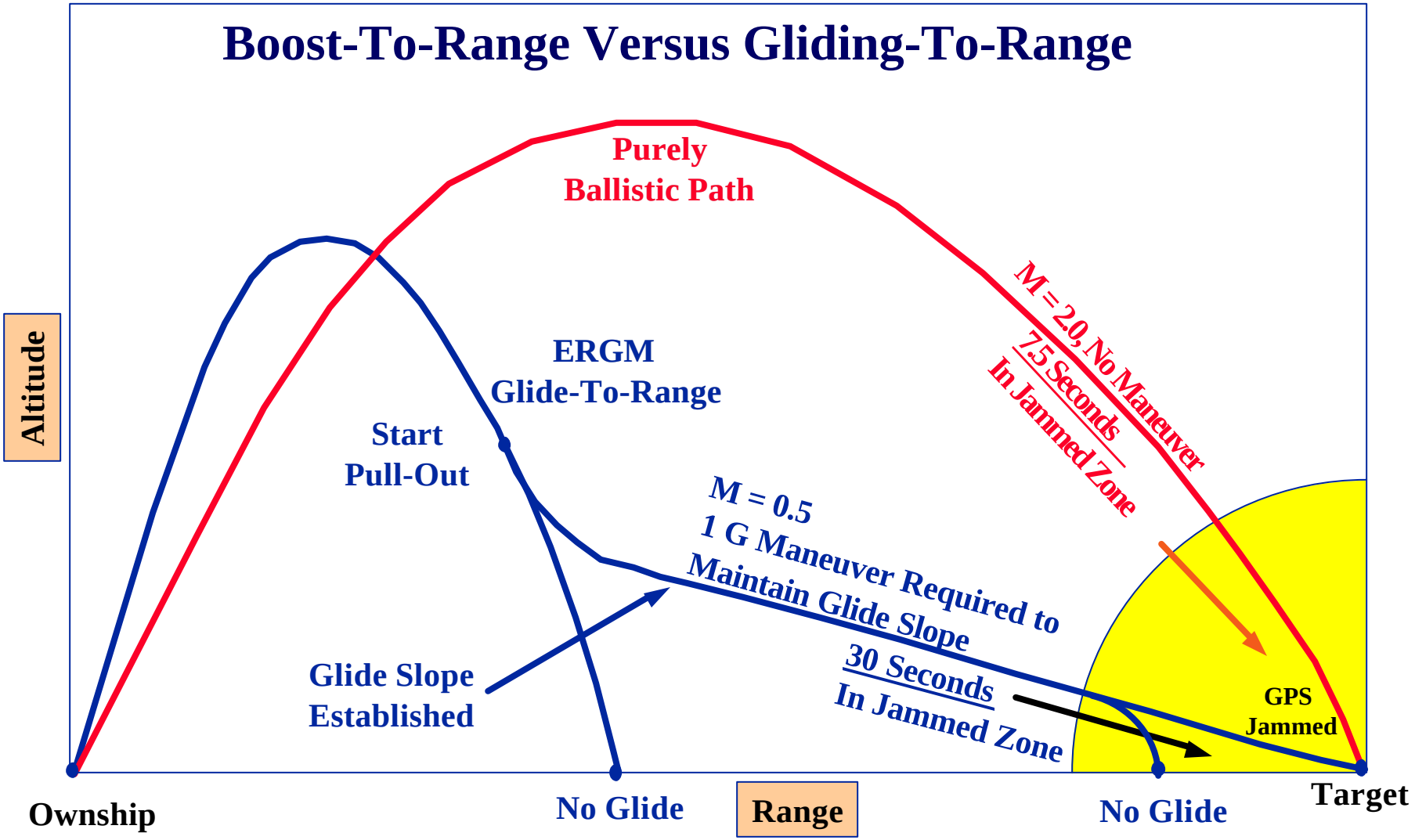
Excalibur Concept of Operations

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

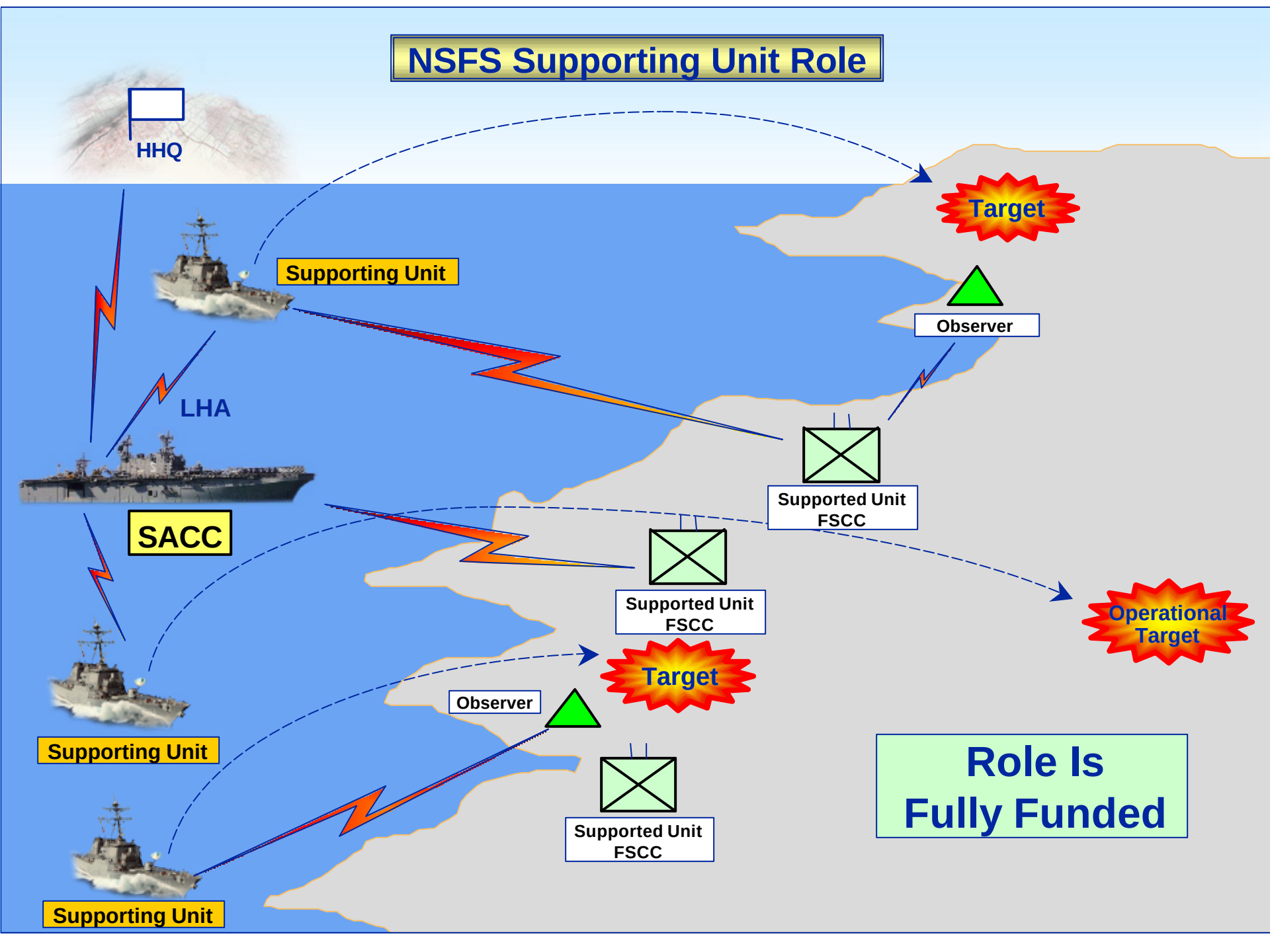


Unitary Warhead XM982 Is Designed To Meet User Needs

Autonomous Naval Support Round (ANSR) vs. ERGM Flight Profile



NSFS Supporting Unit Role



ERGM CONOPS

- **The Paradigm is Changing**
  - **Flying to 70,000 feet + Apogee at Extended Ranges Requires Revisions in Deconfliction & Other Supporting Arms Coordination & Procedures.**
  - **Accuracy Potentially Reduces Number of Rounds Necessary to Accomplish Missions**
    - **Point Targets – 2-3 Rounds / Target**
    - **Area Targets – TBD**
  - **Multiple Rounds Simultaneous Impact (MRSI) increases "first round" effects against targets**
    - **ERGM MRSI capability: 8 rounds +/- 1.5 sec at 40 Nautical Miles**

- **Army, Navy, & Marine Corps Working CONOPS for 5 Years**

Army / Navy Munitions Commonality Objectives

- **Coordinated Management to:**
  - **Leverage R&D Investments**
  - **Reduce Risk**
  - **Enhance Affordability**
  - **Improve Economies of Scale**

GOAL IS LOWEST MUNITIONS LIFE CYCLE COST

BACKUP

Naval Gunfire Support

(Today)

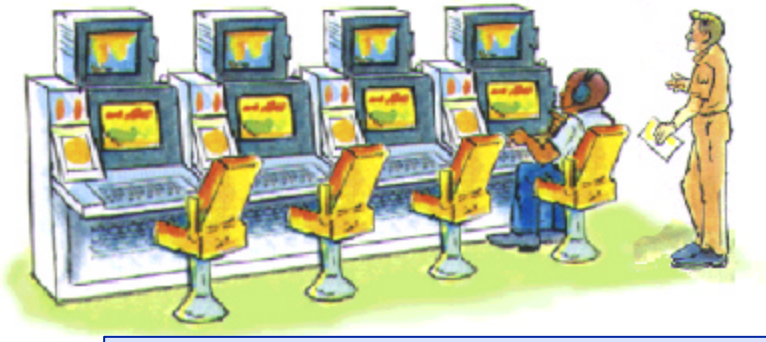
BRIDGE

CIC

Firing Unit Manning (13 people)

(Tomorrow)

CIC



Firing Unit Manning (5 people)

- **Automated NSFS Functions**
- **Full Digital Communications**
- **Automated Tactical Displays**

Reduced Manning

AGS Gun and Magazine

Gun

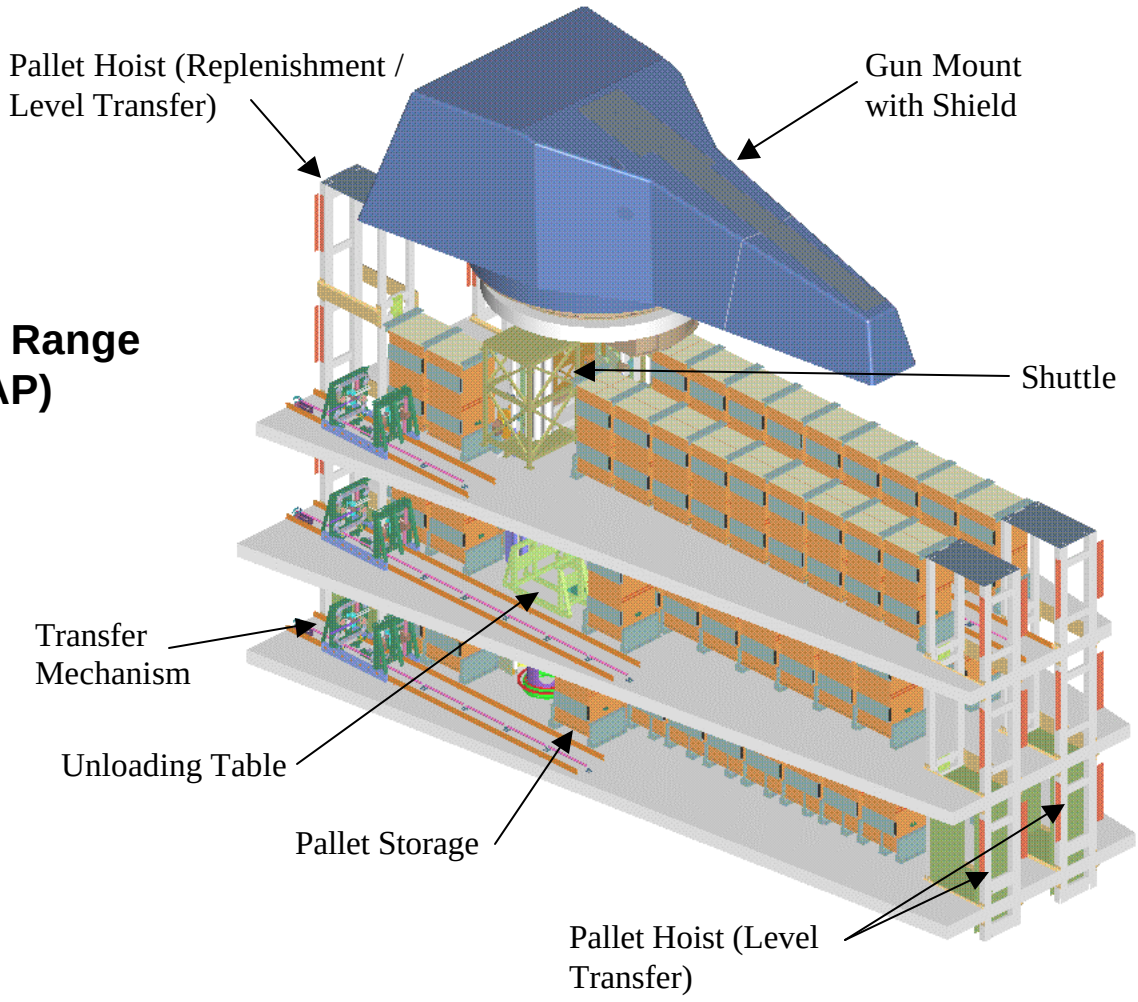
- **12 Rounds per minute**
- **Unmanned operation**

Magazine

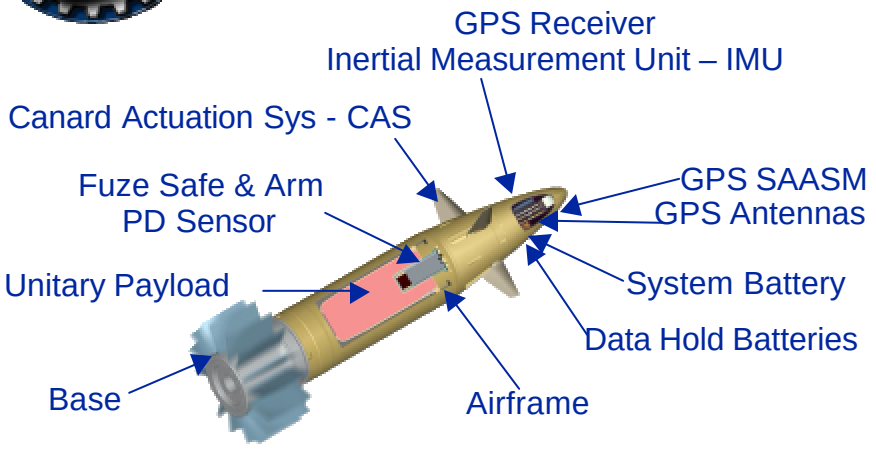
- **Multi-level pallet storage**
- **Notional load out of 600 Long Range Land Attack Projectiles (LRLAP)**
- **Unmanned operation**

Munition (LRLAP)

- **GPS/INS Guidance**
- **High explosive warhead**
- **Range 83NM**



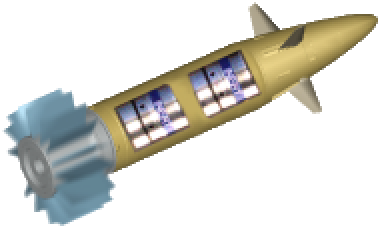
US Army Excalibur System Overview



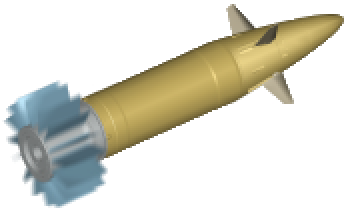
Unitary

Acquisition Phase:

Current: System Development & Demonstration
FY06: Unitary Milestone C
FY08: Unitary IOC



Smart

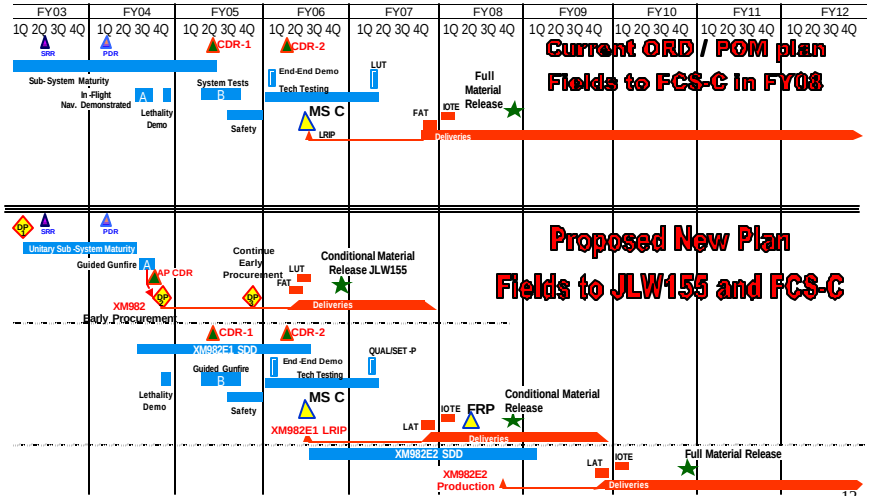


Discriminating

Description:

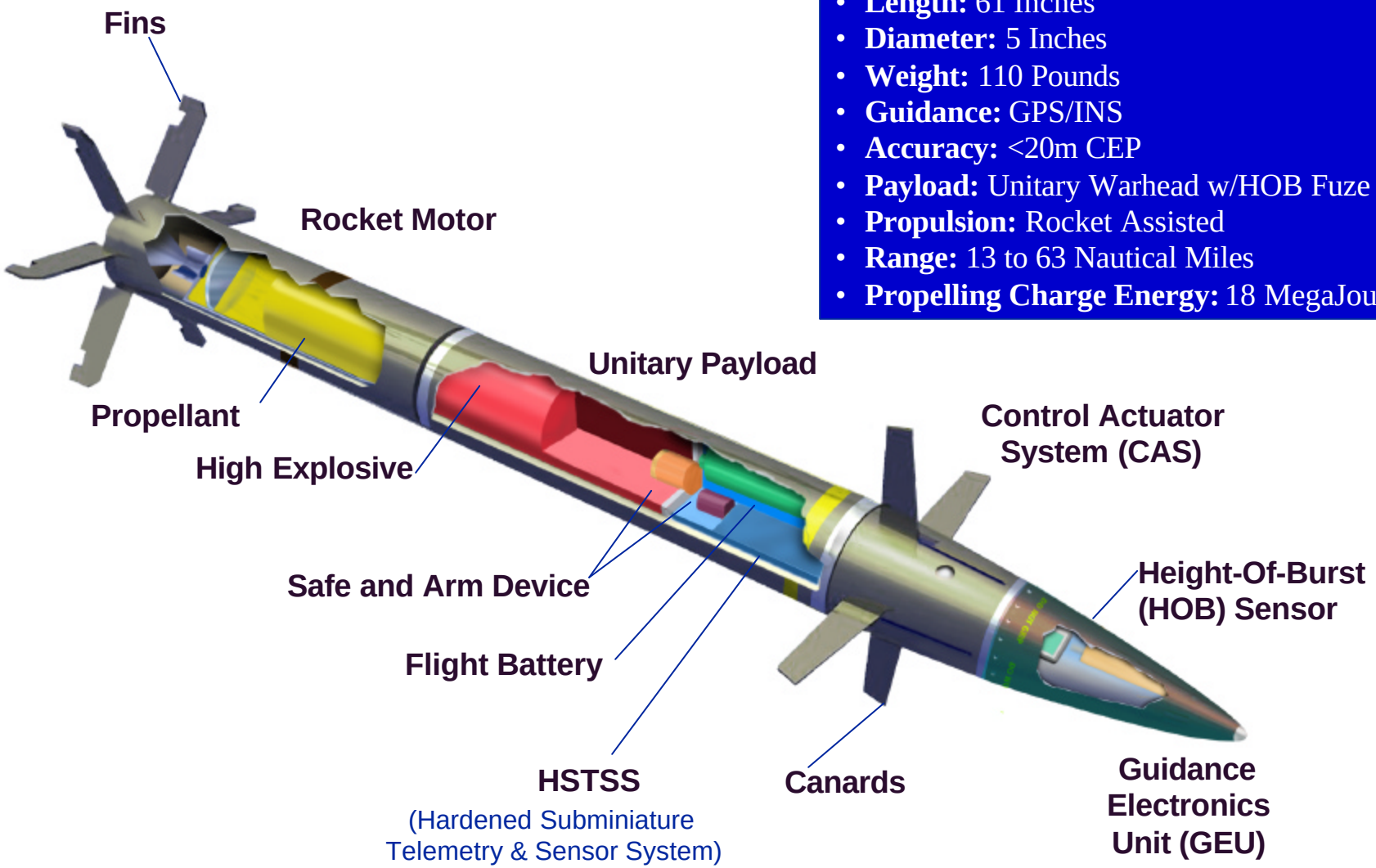
- Fin Stabilized Glide Air Frame
- Inductive Set Integral Fuze with Enhanced Setter
- GPS - Inertial Navigation System (INS) Guidance
- All Weather, Day and Night
- Compatible with JLW155 & FCS Digitized 155mm Platforms
- One Meter Length / 106 lb

Program Schedule

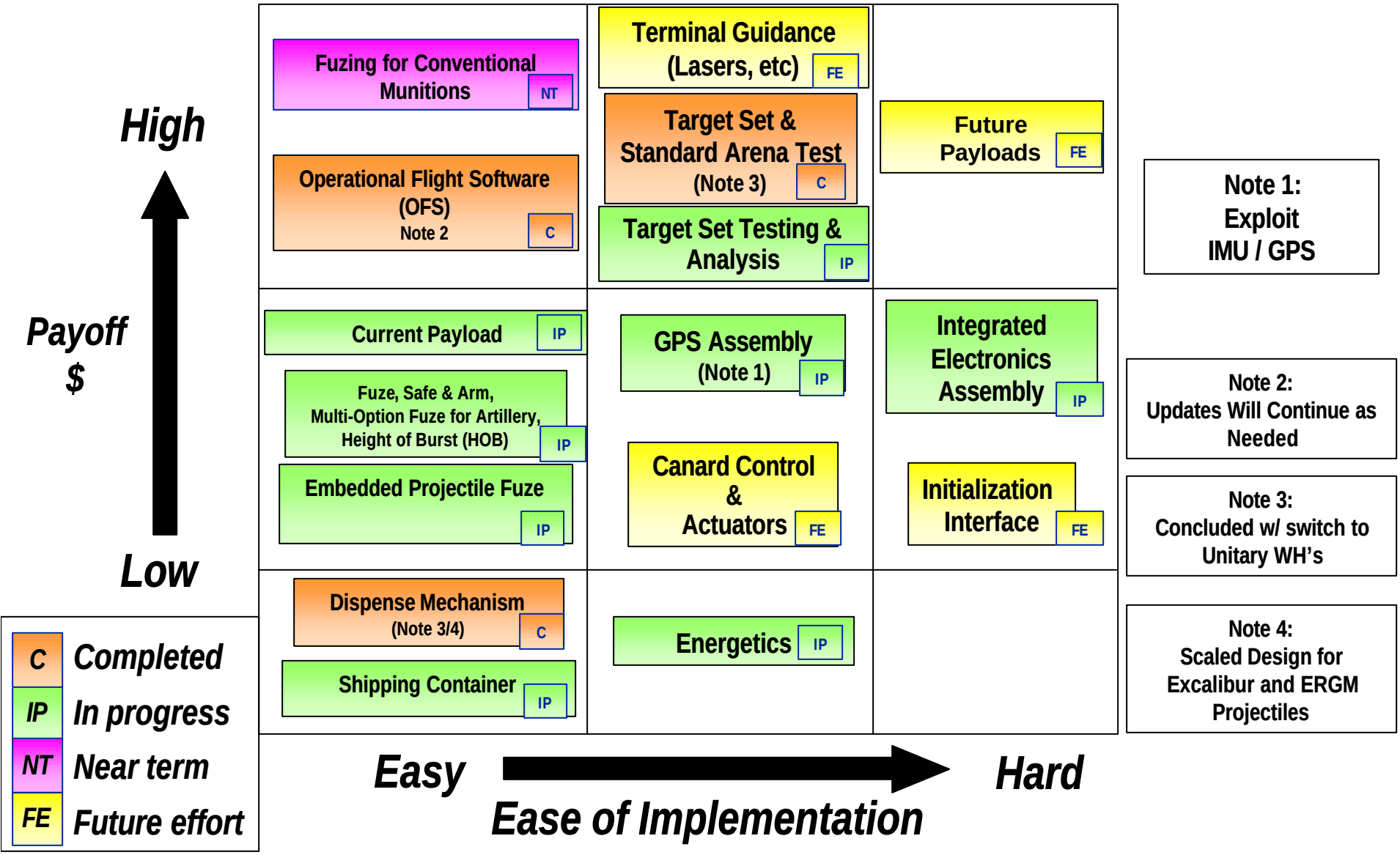


Extended Range Guided Munition (ERGM)

- **Length:** 61 Inches
- **Diameter:** 5 Inches
- **Weight:** 110 Pounds
- **Guidance:** GPS/INS
- **Accuracy:** <20m CEP
- **Payload:** Unitary Warhead w/HOB Fuze
- **Propulsion:** Rocket Assisted
- **Range:** 13 to 63 Nautical Miles
- **Propelling Charge Energy:** 18 MegaJoule



Summary of Commonality Technical Efforts



Road Ahead

- Maintain Fielding Schedule for NSFS Programs

- Pursue Technology Demonstration Programs
  - Low-Cost Guidance Effort - Draper
  - Extended Range Munition (ERM) - ATK

- Continue Commonality Efforts with Army
  - Hardware / Software
  - Common Target Sets and Lethality Models / Explosive Fills
  - Common Procurement Strategies
  - Low-Cost Guidance Electronics Efforts

GOAL: Significant New and Affordable Capabilities for the Warfighter.