

NDIA 48th Annual Fuze Conference

Navy Overview

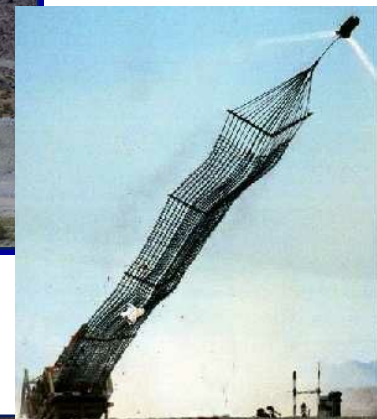




Agenda

- Introduce the Navy Energetics Enterprise
 - A collaboration between Navy R&D labs
- Dahlgren Overview
- China Lake Overview
- Indian Head Overview





Navy Energetics Enterprise



China Lake Crane Dahlgren Indian Head





Navy Energetics Enterprise

- A Coalition Chartered & Led by SYSCOM Vice Commanders of NAVSEA & NAVAIR
 - NAVSEA Ordnance Product Area:
 - Dahlgren, Indian Head & Crane
 - NAVAIR Weapons & Energetics Department:
 - China Lake
- Goal
 - Provide leadership in-line with warfighters' vision,
 - Provide rapid transition of technology to the warfighter,
 - Provide the best technical solutions to the warfighter,
 - Effectively align with industry,
 - Efficiently use resources,
 - Effectively Steward the Navy's energetic core equities.



*NDIA 48th Annual Fuze Conference
NSWC / Dahlgren Division
Overview*



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G34 Branch Head





Guidance Integrated Fuze Technology Development Program



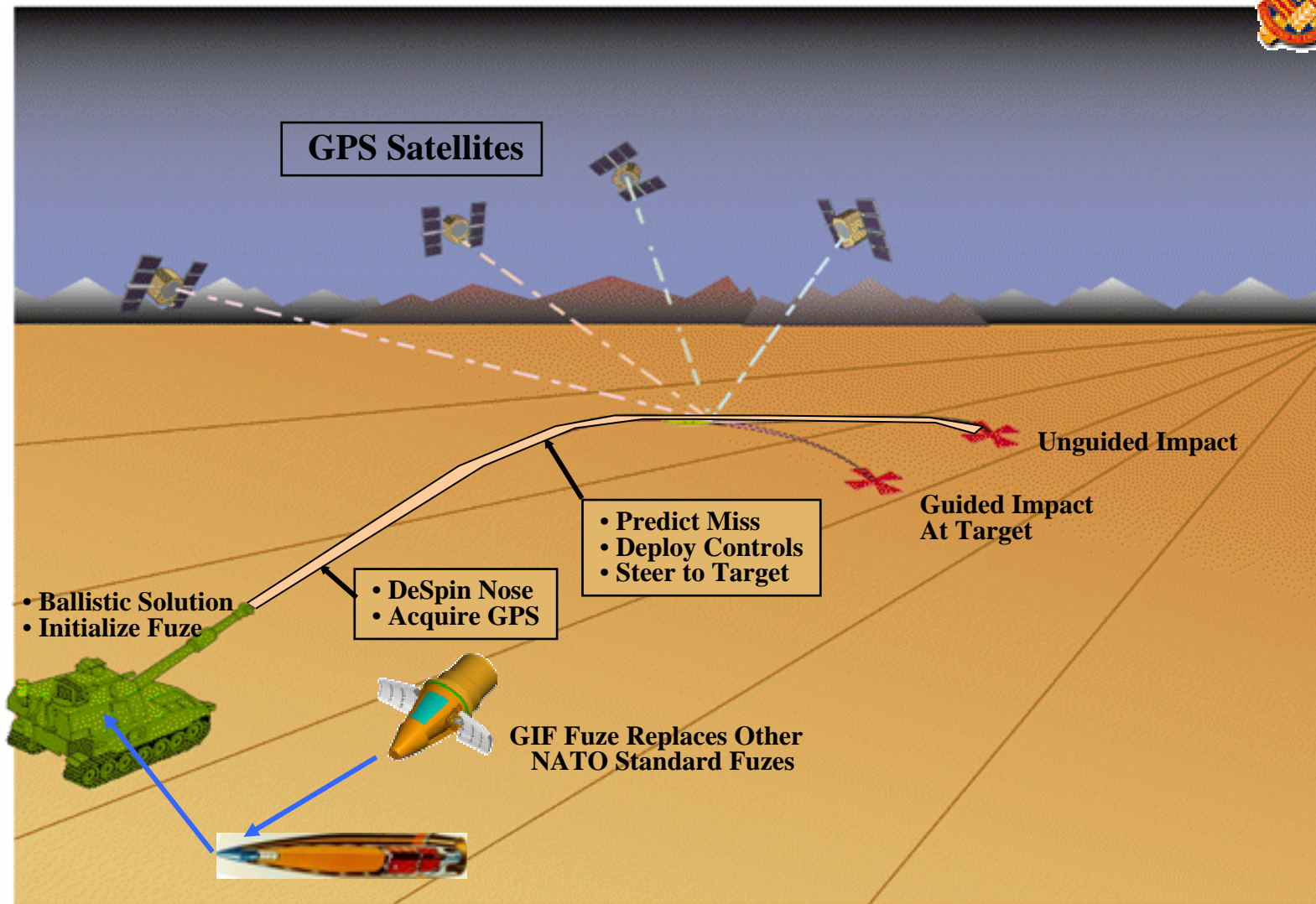
- ***What is GIF ?*** GIF is a low-cost, fuze-sized module that is intended to replace a “NATO standard” fuze on *existing* stockpiled Army, Navy, & Marine Corp Ammunition.
- ***What Does it Do ?*** GIF corrects the ballistic trajectory of the projectile in 2D, resulting in a small terminal miss distance. GIF provides “*First Round - Steel on Target*”.
- ***When?*** The 80% solution, Spiral 1, in FY07. 1000 fuzes for operational assessment/bunker in 155mm system. The 100% solution in FY10, incorporating military grade GPS.

On track for a guided demonstration flight in October of this year





How Does GIF Work?





Low Cost Guidance Electronics Unit (LCGEU) Program Objectives

- Develop a *Low Cost* Alternative Guidance Electronic Unit Concept
- Demonstrate concept capability through flight tests of prototype GEU on EX-171 ERGM & ANSR projectiles

Program Office - NAVSEA IWS3C
Technical Design Agent -
NSWCDD
Prime Contractor - Charles Stark
Draper Laboratory





Program Objectives Met

in Oct 2003

- LCGEU guided ERGM to within 20 m of the target at 44.8 nmi
- LCGEU guided ANSR to within 20 m of the target at 53.6 nmi

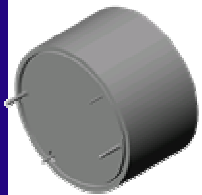




Fuze Power Supply PIP



- Objective
 - Develop battery to replace MFF's lead acid battery
- Approach
 - Investigate two battery designs
 - ATK's MOFA
 - Thales' UA 6275/821
 - Conduct Electrolyte research for MOFA battery
 - Increase the rise time & current carrying capability
 - Most significant research into electrolyte rise time for many years
 - Enhance test capability
 - Now able to test gun fired fuze batteries with simulated fuze electrical load profile in rail gun
 - ARL airgun validated
 - MOFA Battery Risetime results same in both guns





MK 417 76mm RF Prox Fuze

- Navy & CG has continuing need for 76mm ammo
- Final Procurement of MK 417's occurred in FY 03
- Obsolescence prohibits further procurement





MK 417 76mm RF Prox Fuze

- Risk Mitigation Program Initiated in Anticipation of Future Procurement
- Hardware Producibility Improvements
 - Update electronics & RF design
 - IM Booster Required
 - New Battery Required (Lead acid no longer manf.)
- Synopsis Issued
 - ASuW is Highest Priority
 - HSMST



MK 437 MOFN Update

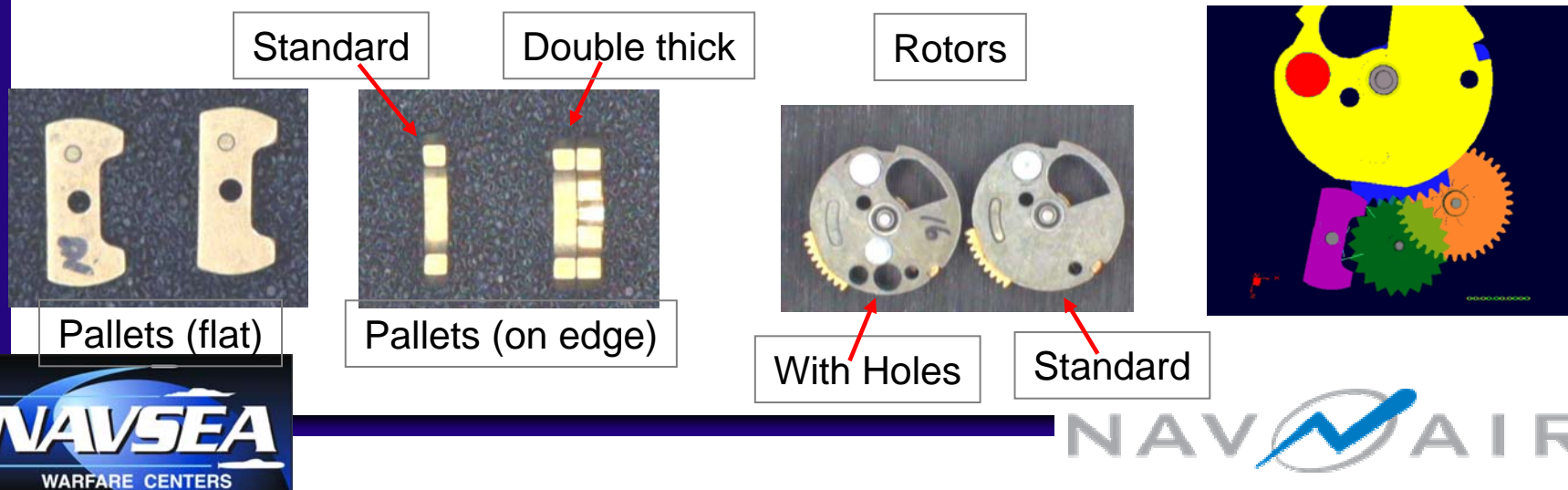
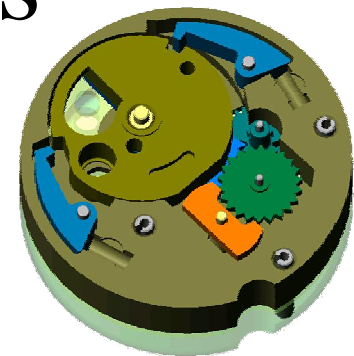
- Navalization PIP to Army's MOFA uses "Change as little as possible" paradigm
- Navalization effort
 - Modify Inductive set software & hardware for Gun setter compatibility
 - Increase timing accuracy to .01 seconds
 - Modify S&A to Increase min arming to 400'
 - Harden for Navy Electro-Magnetic Radiation environment
- Status
 - Contract Award to L3 Communications May 2003
 - KDI, Bulova and EDC
 - Software PDR Held Sept 2003
 - Inductive Set and Safe & Arm device PDR held Nov 2003
 - Currently finalizing engineering changes required to enable build of first lot of 20 fuzes for qualification testing





MOFN S&A Progress

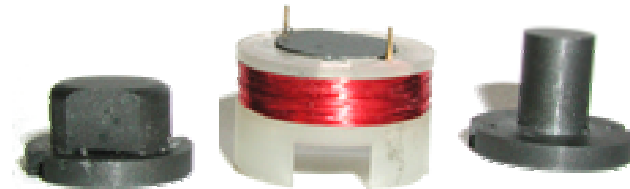
- Go Forward Configuration:
 - Reduce Rotor mass: drill holes in standard rotor
 - Increase Pallet moment of inertia: use double thick Brass Pallet
 - Preliminary results indicate >400 feet min. arm distance
 - Proof of Design testing to be completed in April
 - S&A arming distance and reliability testing in May





Inductive Interface Progress

- Two bench top designs pursued
 - 1st made changes to coil, added ferrite core, tuned circuit, reduced power consumption
 - 2nd used ferrite impregnated nylon for coil form, more than doubled turns on coil, continued work in tuning circuit & reducing power requirements
- Down-selected 1st design
 - ferrite impregnated nylon yielded unpredictable performance from batch to batch
- Ready for Proof of Design testing





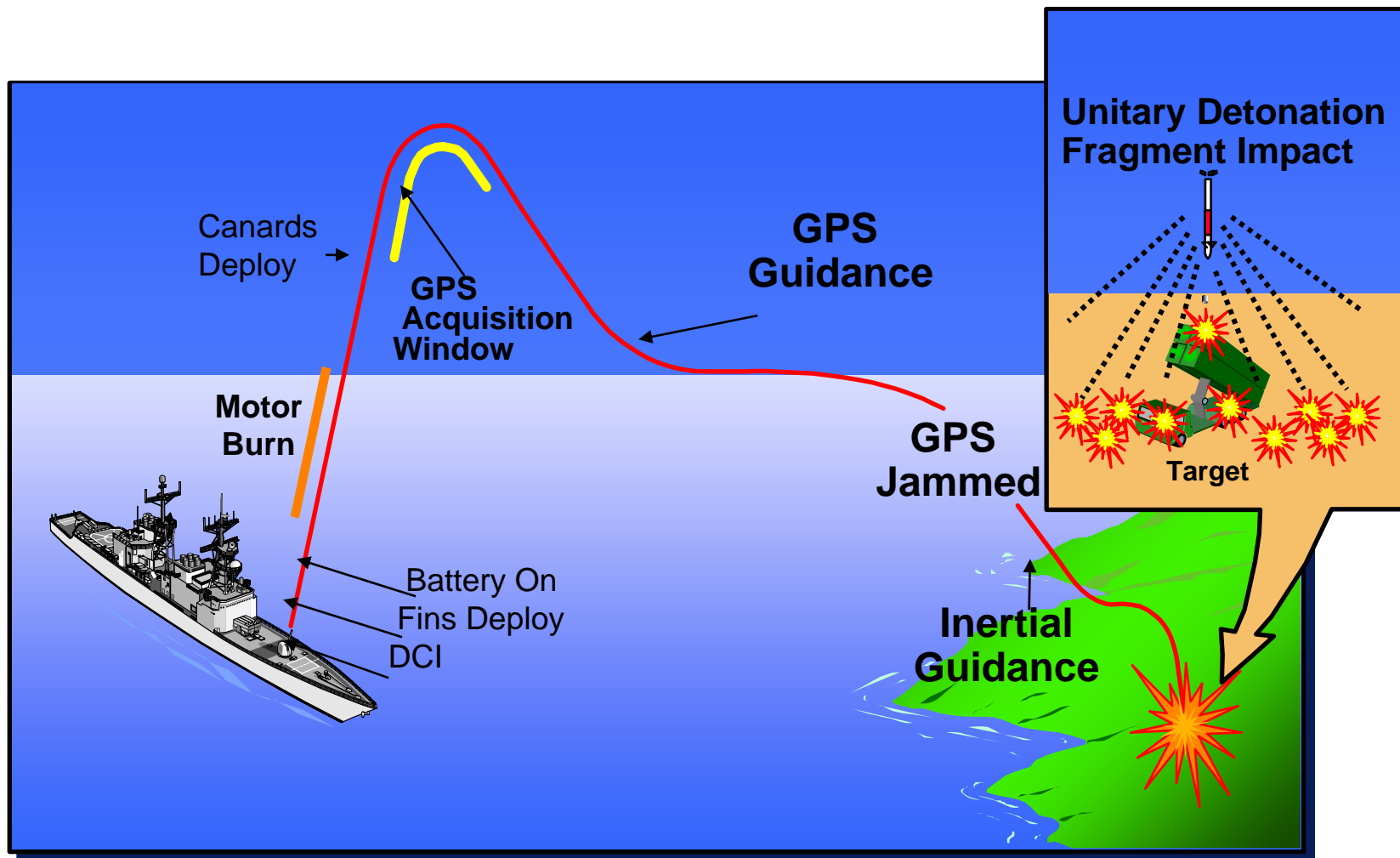
Software Progress

- Intended to modify existing software (2000+ lines of assembly code)
- Doing total rewrite of the Software to meet safety requirements
- Based on IEEE/EIA 12207.1 &.2
- Completed Software Design Document
- Completed Software Preliminary Design Review
- Generating Code Now



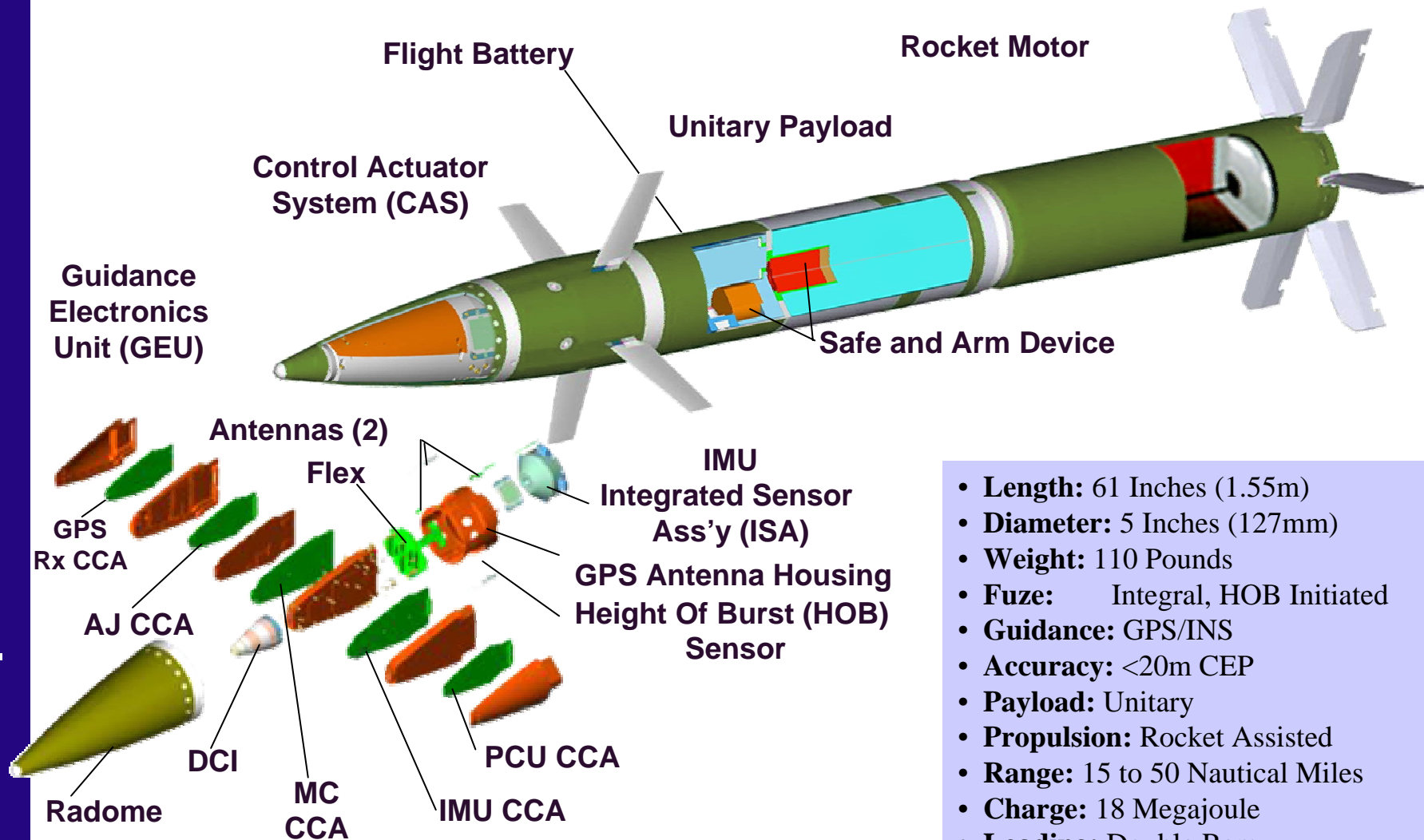


ERGM Concept of Operations





ERGM Projectile



- **Length:** 61 Inches (1.55m)
- **Diameter:** 5 Inches (127mm)
- **Weight:** 110 Pounds
- **Fuze:** Integral, HOB Initiated
- **Guidance:** GPS/INS
- **Accuracy:** <20m CEP
- **Payload:** Unitary
- **Propulsion:** Rocket Assisted
- **Range:** 15 to 50 Nautical Miles
- **Charge:** 18 Megajoule
- **Loading:** Double Ram



Multi-function Fuze (MFF) Update

- Progress
 - FAAT passed
 - LAT #1 passed
 - LAT #2 passed
- Next
 - GWS integration tests spring '04
 - Shipboard OPEVAL summer '04
 - Milestone III end of FY

