MK 45 Weapon System

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Agenda

- Patrol Coastal Class Ship Capability Gap
- Solution Overview
- Planned Demonstration Event
- Path Forward
- Additional Features Under Consideration

Patrol Coastal Class Ships

MK 96

MK 38 MOD 1

PC Weapon Systems

- Current Configuration
  - MK 38 MOD 1 forward
  - MK 96 AFT (6 ships updated with MK 38 MOD 2)
- Issue/Capability Gap
  - Forward mount not stabilized or optically supported
  - High sea states will not allow crew in the focsle area
    - Loading
    - Operating
    - Maintaining
  - MK 38 MOD 2 not a good candidate due to green water and would be inaccessible, like the MK 38 MOD 1
- Developing requirement for a forward Weapon System
  - Remote controlled with on-mount EOS
  - Out range small arms
  - Optics capable of providing improved operational awareness
  - Weapon light enough to remove and stow below deck during extreme sea-states

Solution

- **MK 38 MOD 2 Program of Record replaces the MK 96 aft Weapon System**
- **Develop a lightweight alternate Weapon System for the forward position**
  - **Install in an alternate location**

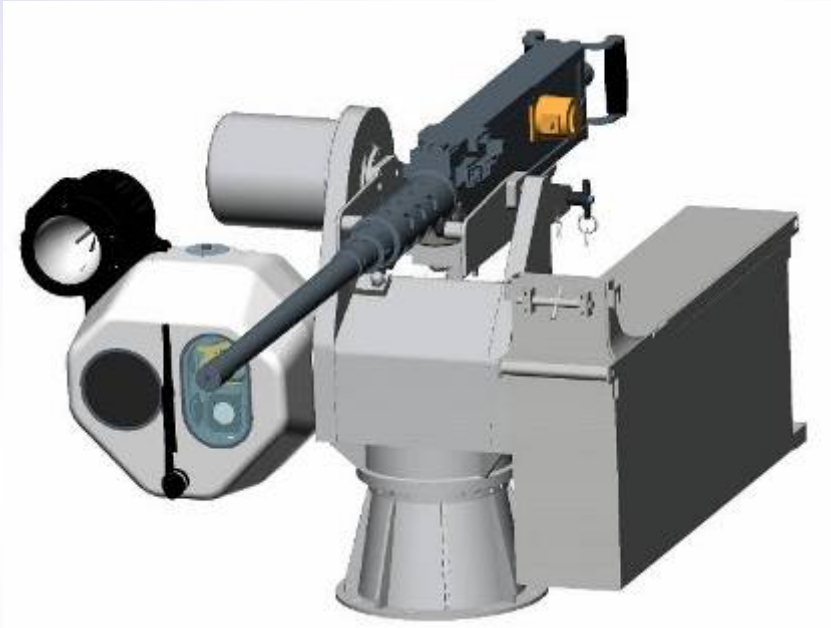
MK 38 MOD 2 Installation
Aft Location

MK 45 Weapon System

HSV 2 SWIFT

USCG 87’ Patrol Boat
COCHITO

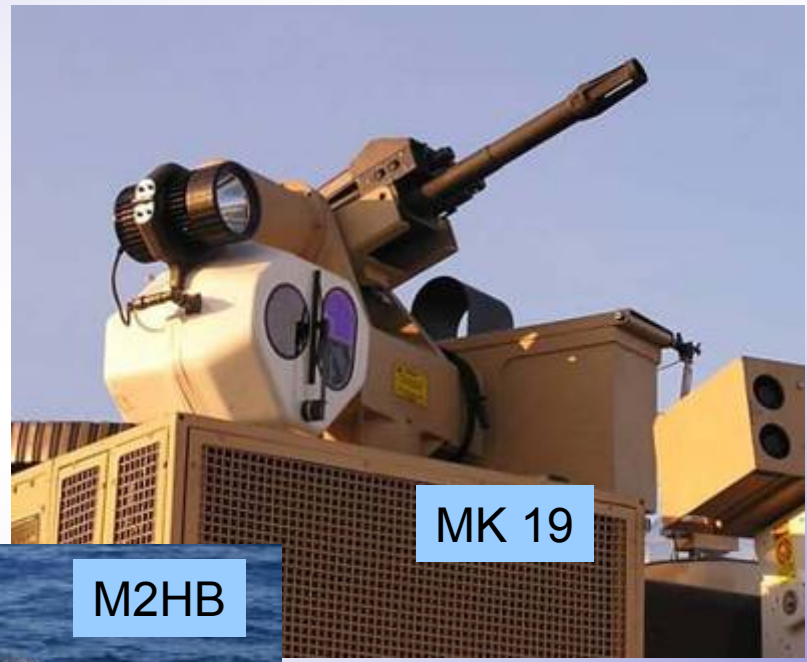
MK 45 Weapon System

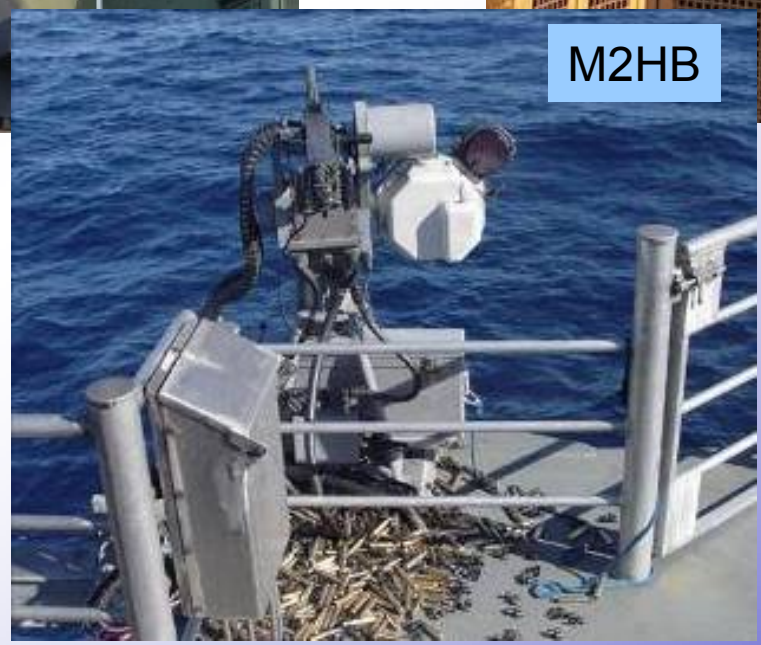


- Two axis gyro stabilized
- Remote firing utilizing on-mount optics
- Autotracker
- WSESRB approved for HSV 2 SWIFT

- Cooled FLIR (3-5 micron)
- 2 fixed FOV's (10.8º and 2.2º)
- Day color camera
- Variable zoom (43º to 1.8º)
- 1 Hz eye safe laser rangefinder
- "NightHunter" spotlight
- Optics Wiper/washer

MK 45 w/M240, MK 19, M2HB





DARPA LW Mount – G Wagon Installation

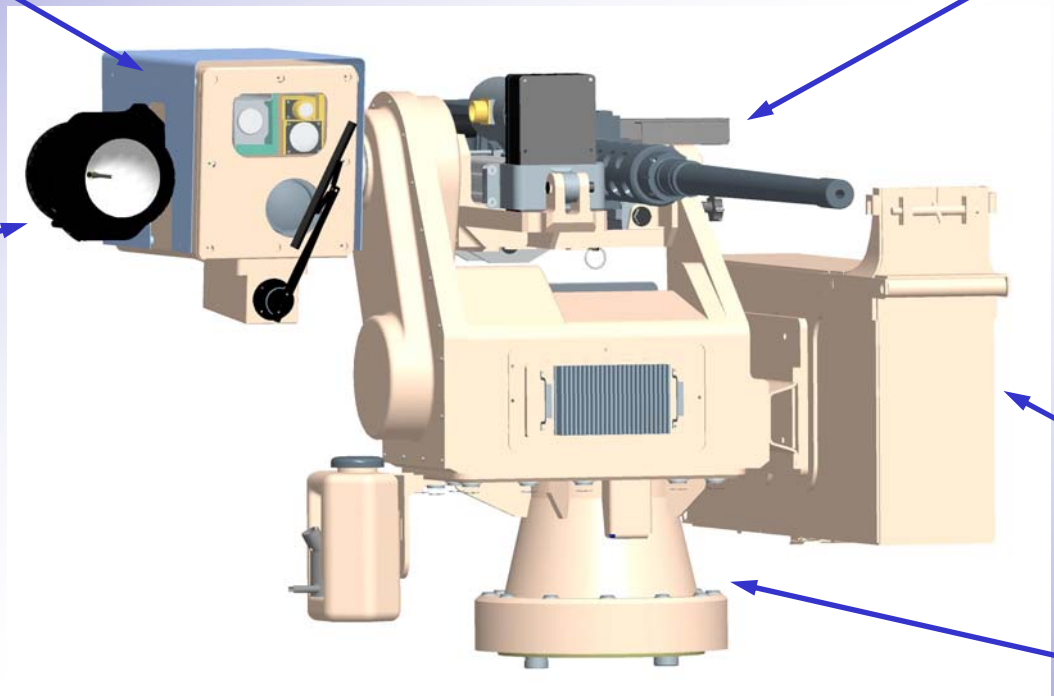
Naval Expeditionary Overwatch (NEO)

Gunslinger Spiral 3 Mount

Two Axis Drive
FOG Stabilized

Sight Package

Spot Light



Elevation
-25 deg
+50 Deg

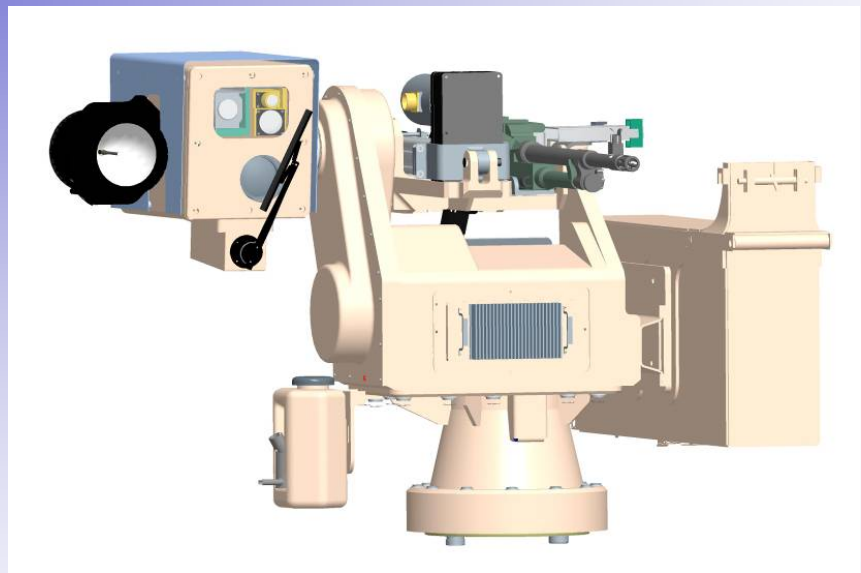
On-Mount Ammo Box
- 400 .50 Cal M2HB
- 1,600 7.62 M240

Slip Ring
360 Deg Cont.

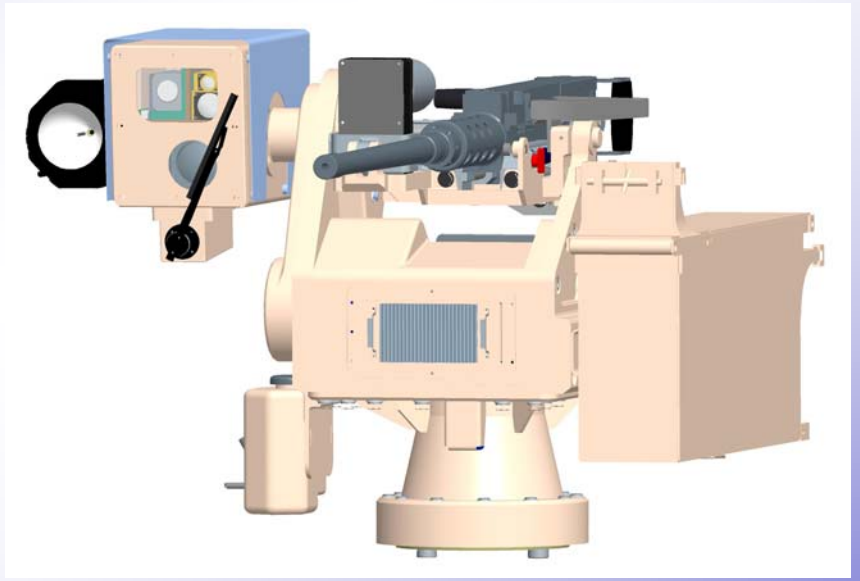
Mount Weight Approx. 265 (No Gun or Ammo)
Overall Dimensions with M2HB = 29.4”H x 38”W x 65.2”D
Working Radius with M2HB = 42.2”

Naval Expeditionary Overwatch (NEO)

Gunslinger Spiral 3 Mount



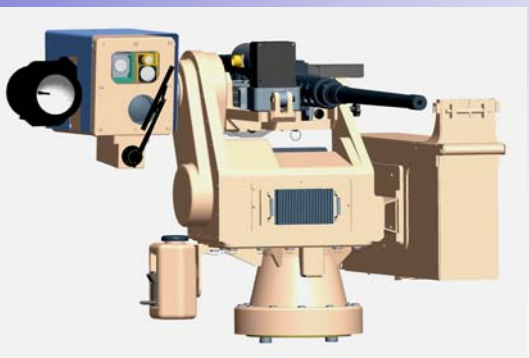
M240 7.62
1,600 Round Capacity



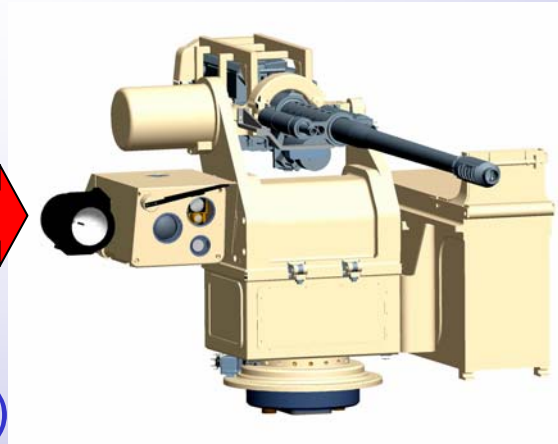
M2HB .50 Cal
400 Round Capacity

Modular Advanced Weapon System (MAWS)

Development

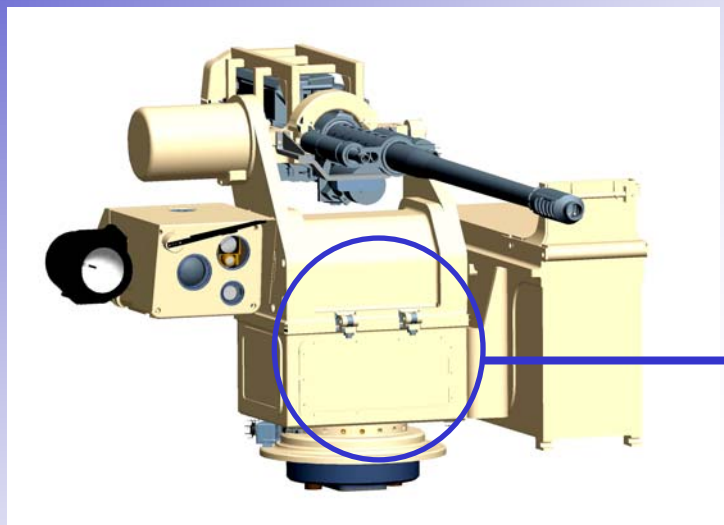


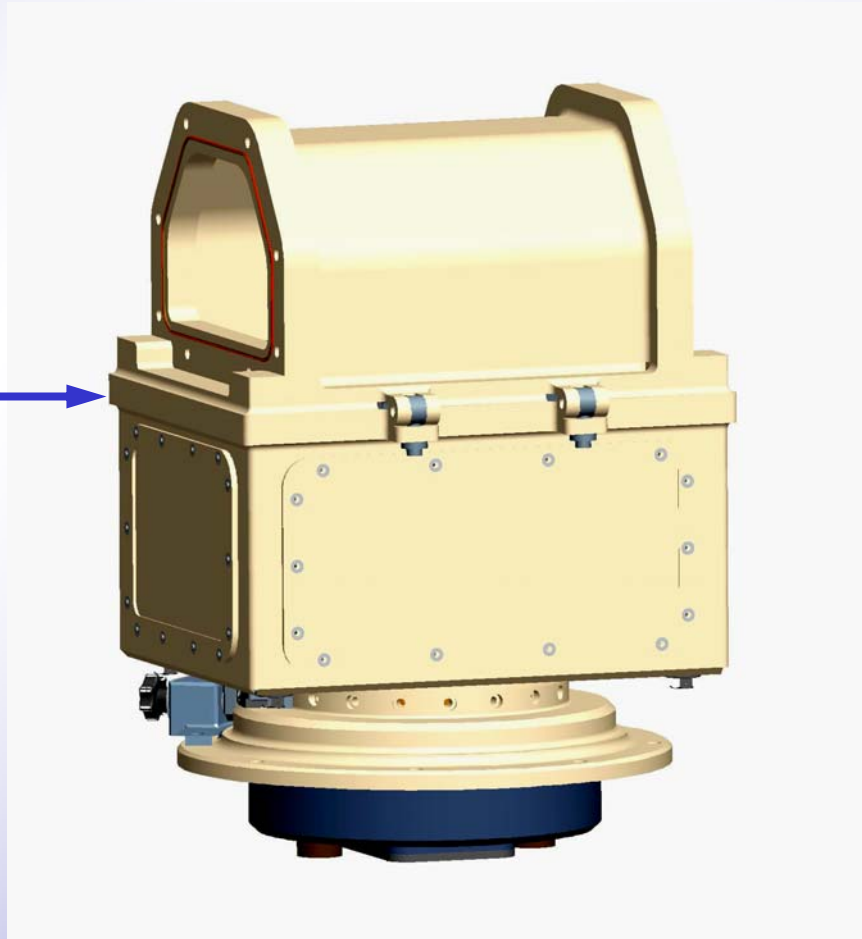
Repackage current MK 45 and MK 45 LW Systems and add new capabilities Into a new Modular Advanced Weapon System (MAWS)



Modular Advanced Weapon System (MAWS)

Common Base Assy



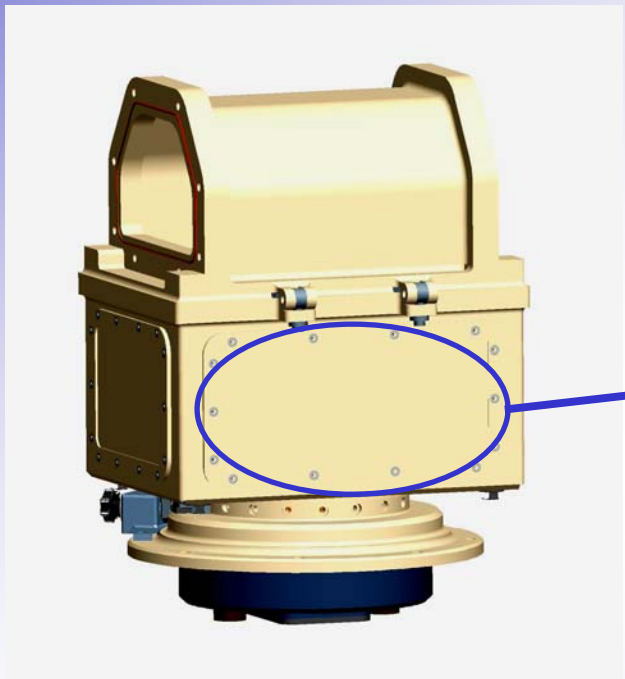


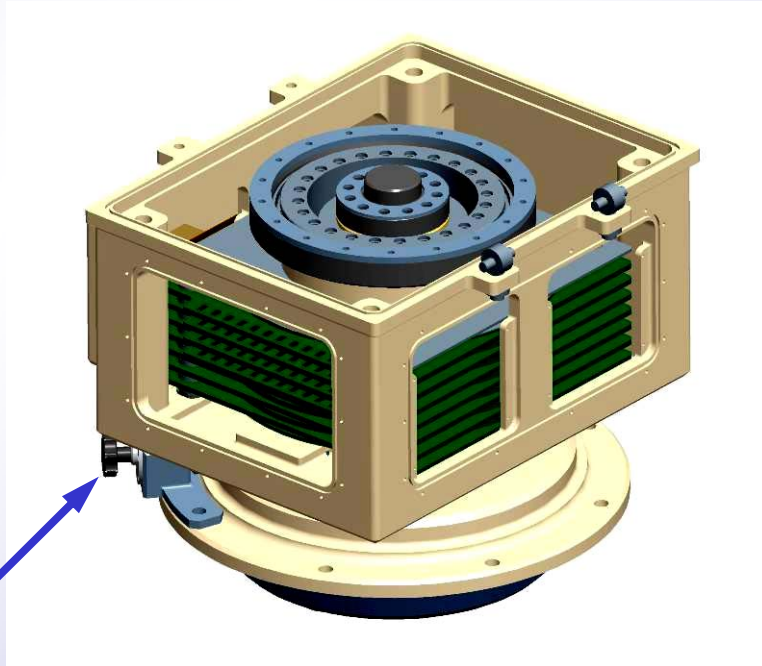
Base Structure Contains:

- Azimuth power drive
- Slip-Ring
- In gimble electronics (Amp Box)

Modular Advanced Weapon System (MAWS)

Integral Slip Ring





Scaleable slip-ring design allows the addition of circuit paths as needed for payload requirements

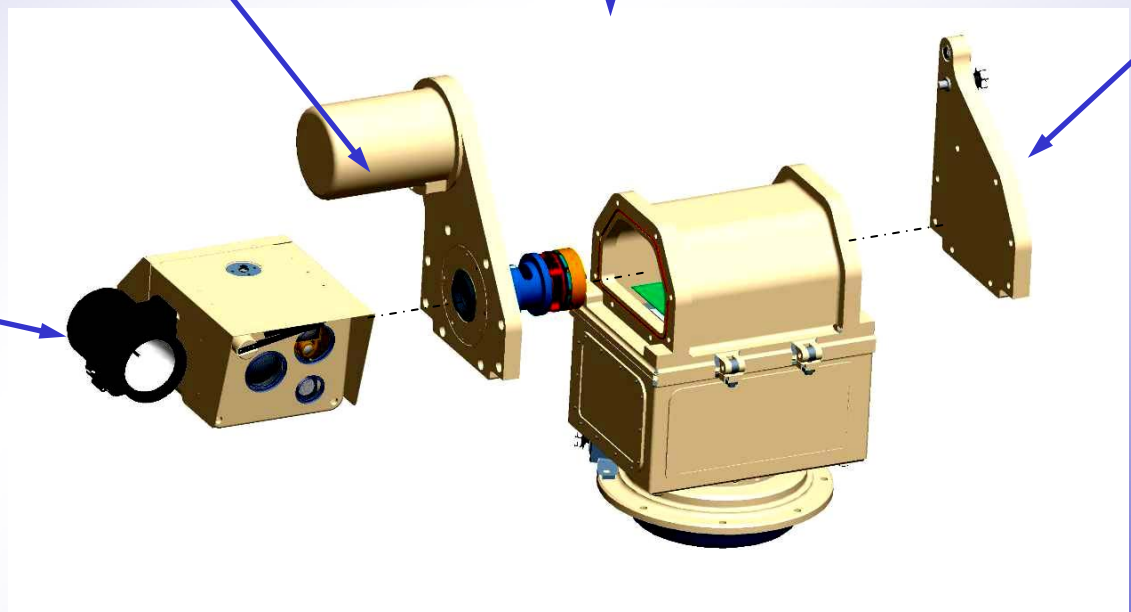
Modular Advanced Weapon System (MAWS)

Three Axis Configuration

Three Axis Drive Trunnion Assy contains independent sight and payload drives

Support Trunnion

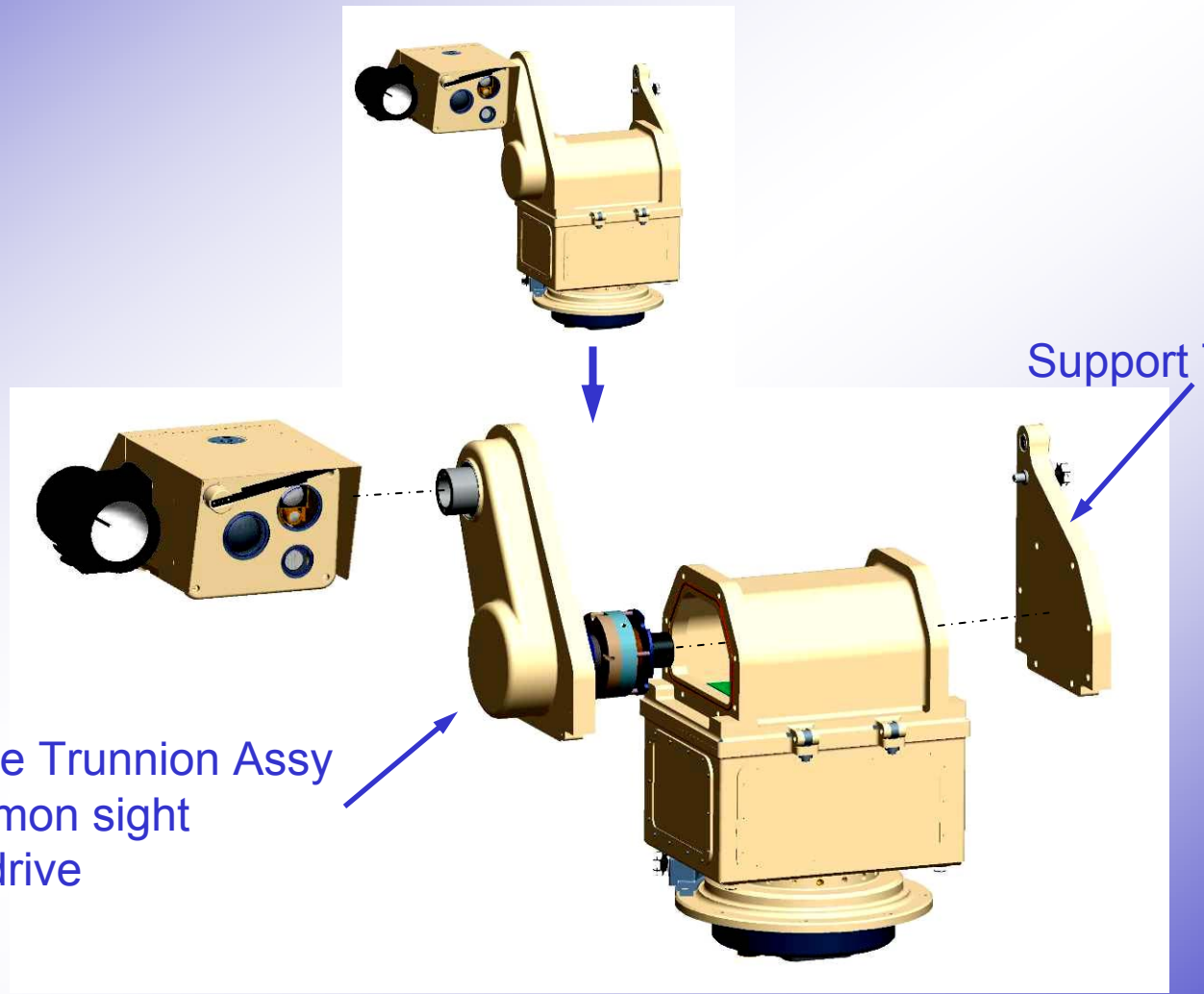
Sight Assy



Common Mechanical and Plug and Play Electronic Interfaces

Modular Advanced Weapon System (MAWS)

Two Axis Configuration

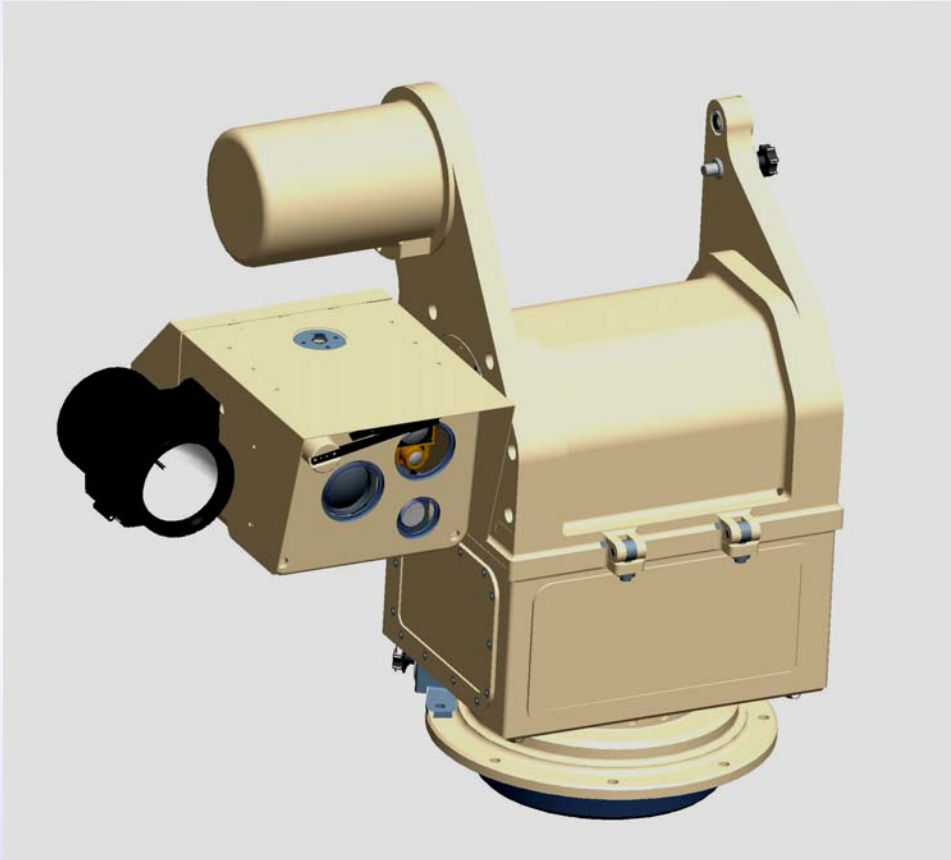


Common Mechanical and Plug and Play Electronic Interfaces

Modular Advanced Weapon System (MAWS)

Sight Interface

- Sight interface has common mechanical and electrical interfaces for plug and play compatibility between sight packages



Modular Advanced Weapon System (MAWS)

Principle Concept

- **Modular Advanced Weapon System**
  - **Modular/Scaleable design is adaptable to many payloads and various performance requirements**
  - **Lightweight**
    - **Baseline construction – Aluminum weldments, castings when possible**
    - **Objective – Composite manufacture when possible**
      - **Composite Study Funded**
  - **Cost**
    - **Modular design allows configuration options that satisfy cost/performance requirements**

Modular Configurations

M2HB .50 cal

M240 7.62

MK 19 40mm

M134 7.762mm Gatling Gun

Common Base Assy

M230LF 30mm

Long Range Acoustical Device LRAD 500 and Optics Package

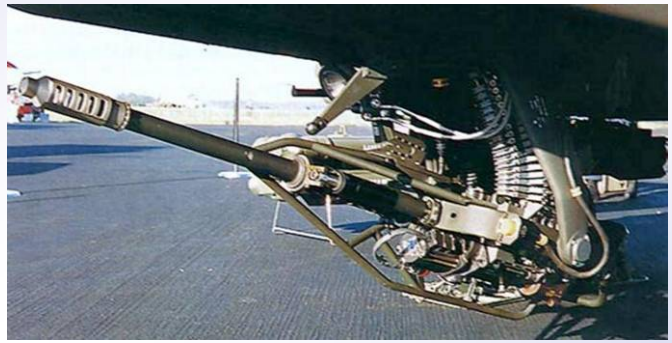
LW25 25mm with LRAD 500

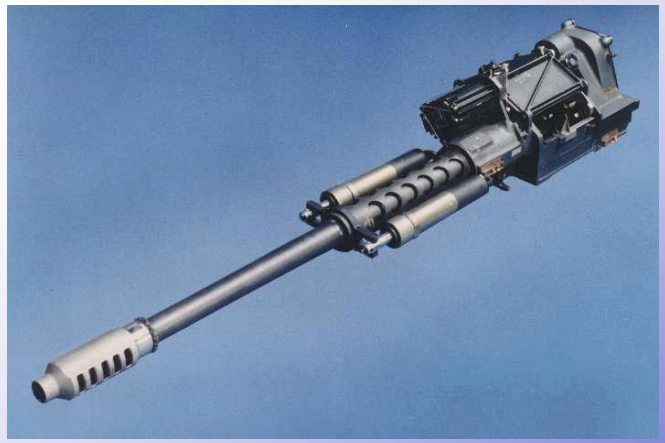
Surveillance Payload w/ Alternative Spotlight

Weapon Choice

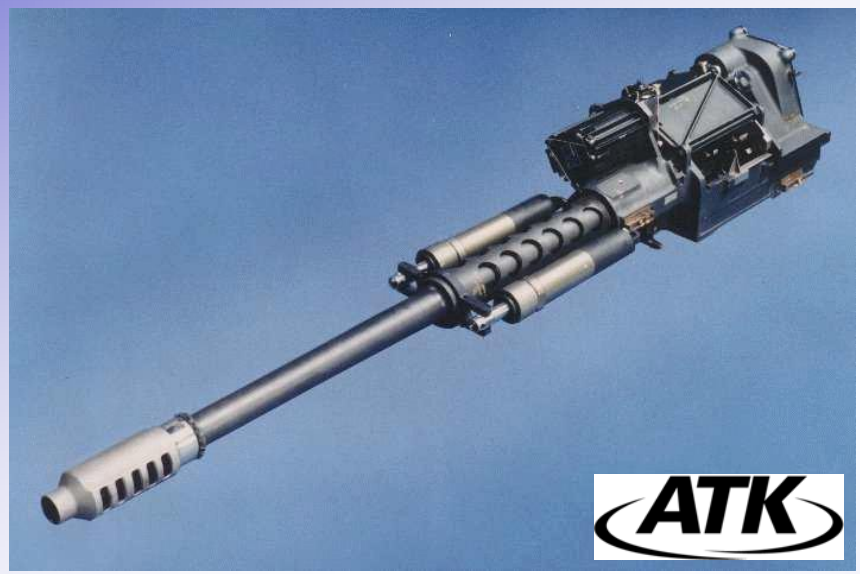
M230LF

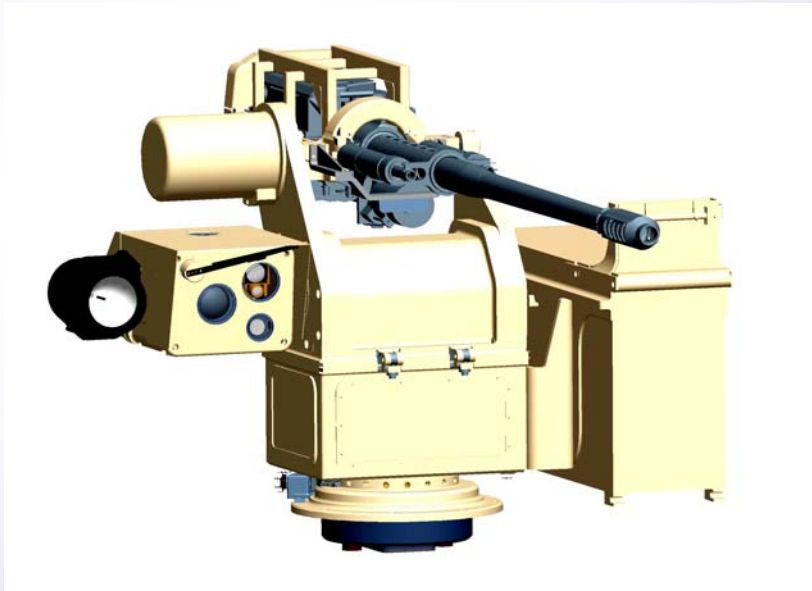
- Details:
  - 30mm Chain Gun
  - Effective Range - ~2,500 Yards
  - Lightweight - Approx. 160 lbs
  - Fires electric primed ammunition
  - M230 linkless Chain Gun used on Army AH-64 Apache Helicopter and MH-60 Aircraft
  - M230LF variant being applied to this program is derived from the M230 with the follow modifications:
    - Modified feeder for linked ammunition
    - Added recoil attenuation buffers
    - Percussion firing mechanism – upgrade kit
- Known Issues:
  - M230LF Not Type Classified
  - Requires some degree of design finalization by ATK
  - Level of Marinization unknown





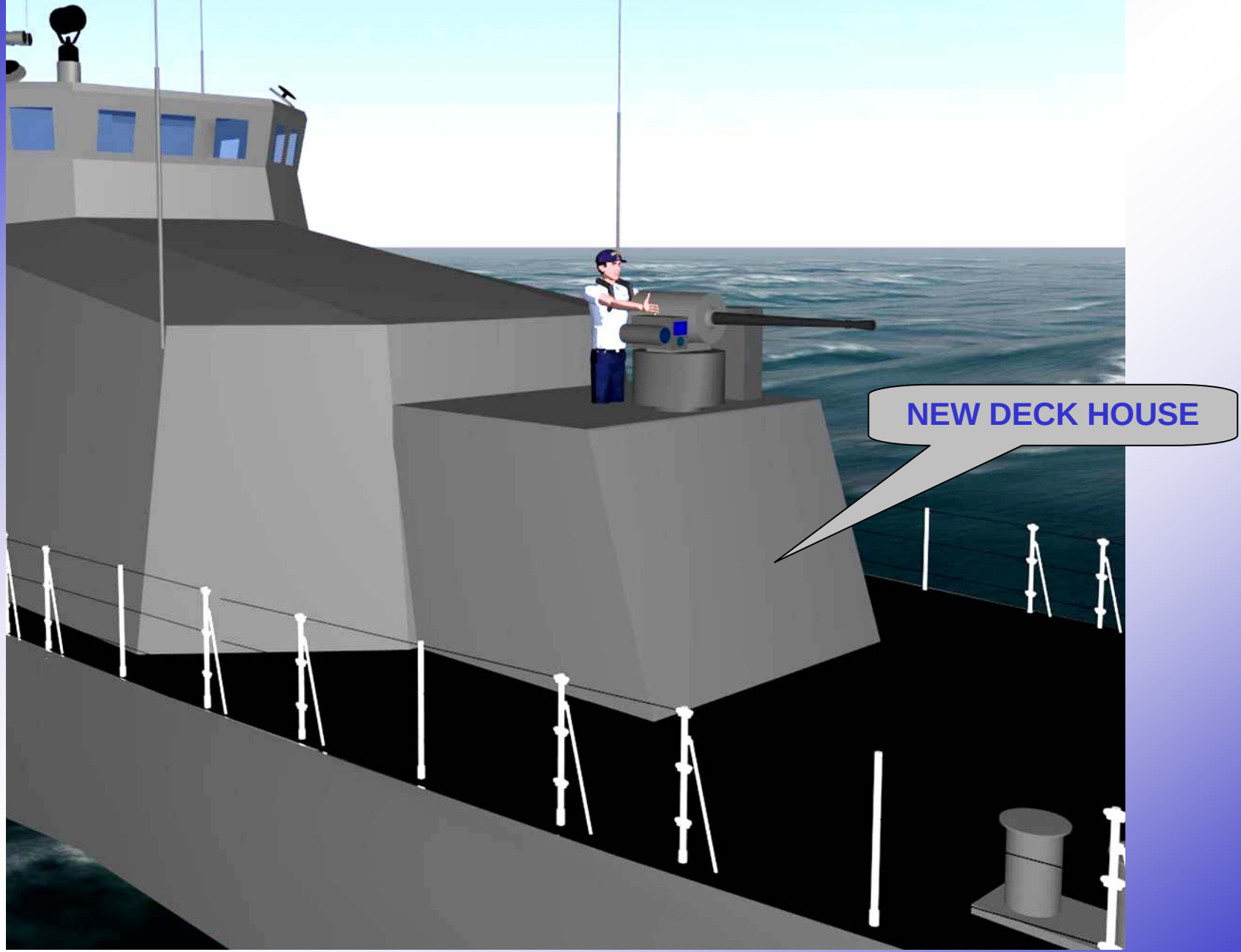
Weapon System Integration



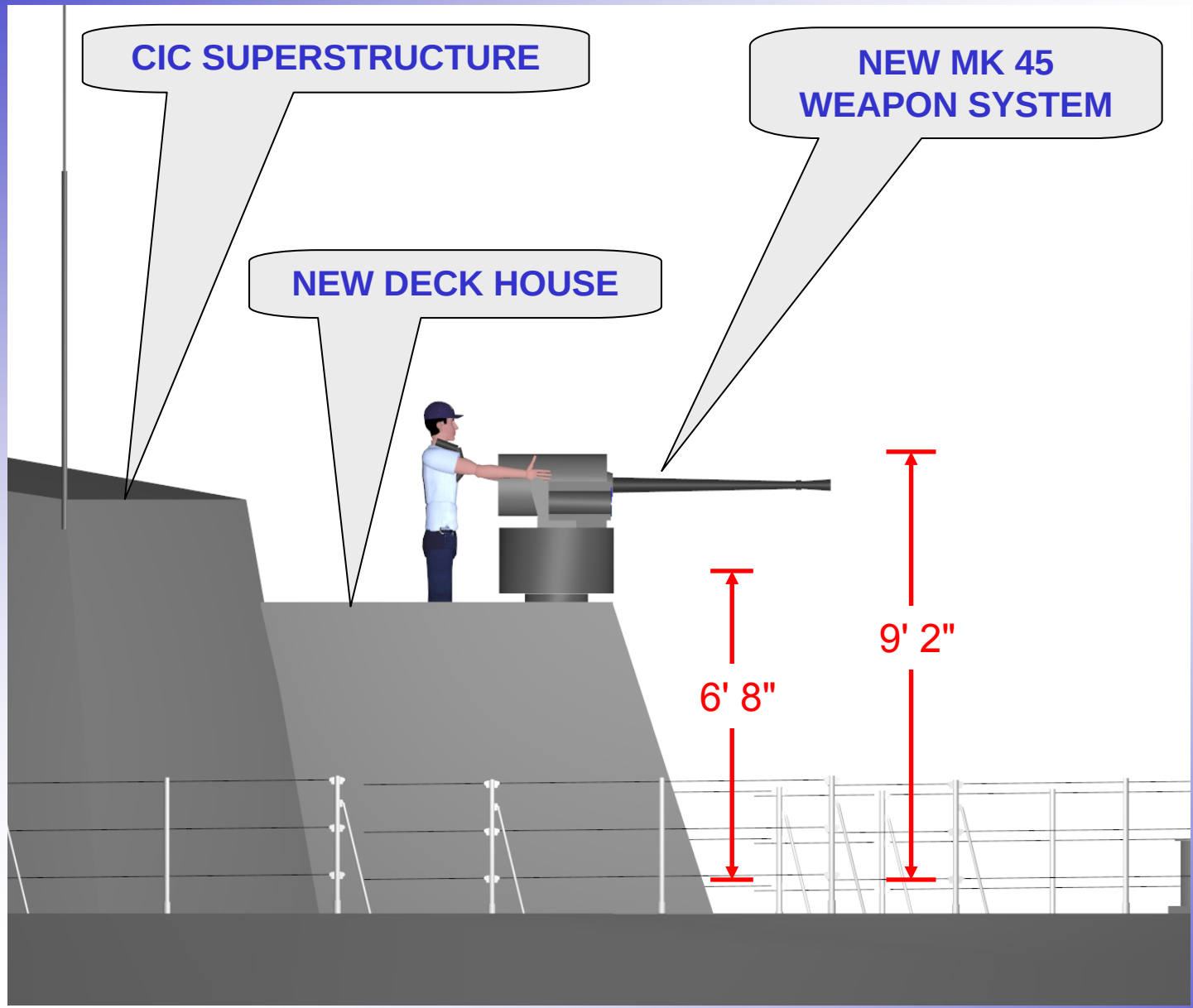


MK 45/MAWS

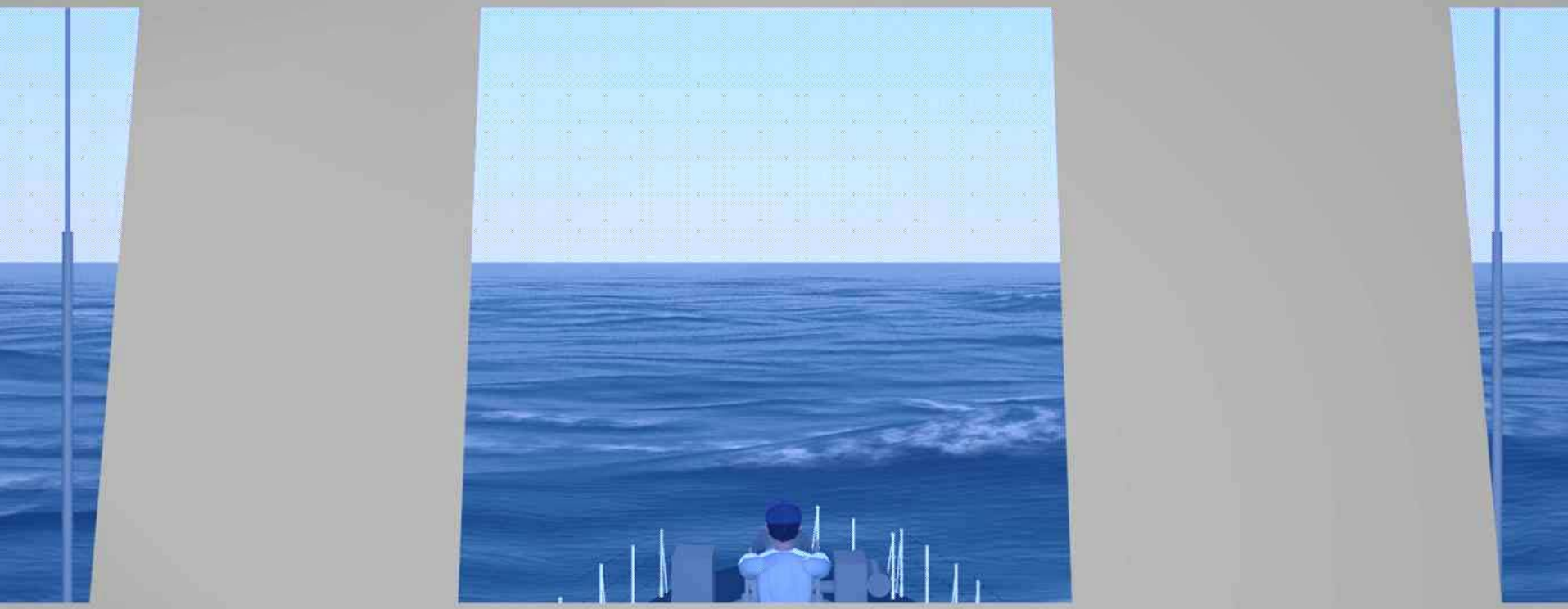
PC Location Option
for Sept 09 Demonstration



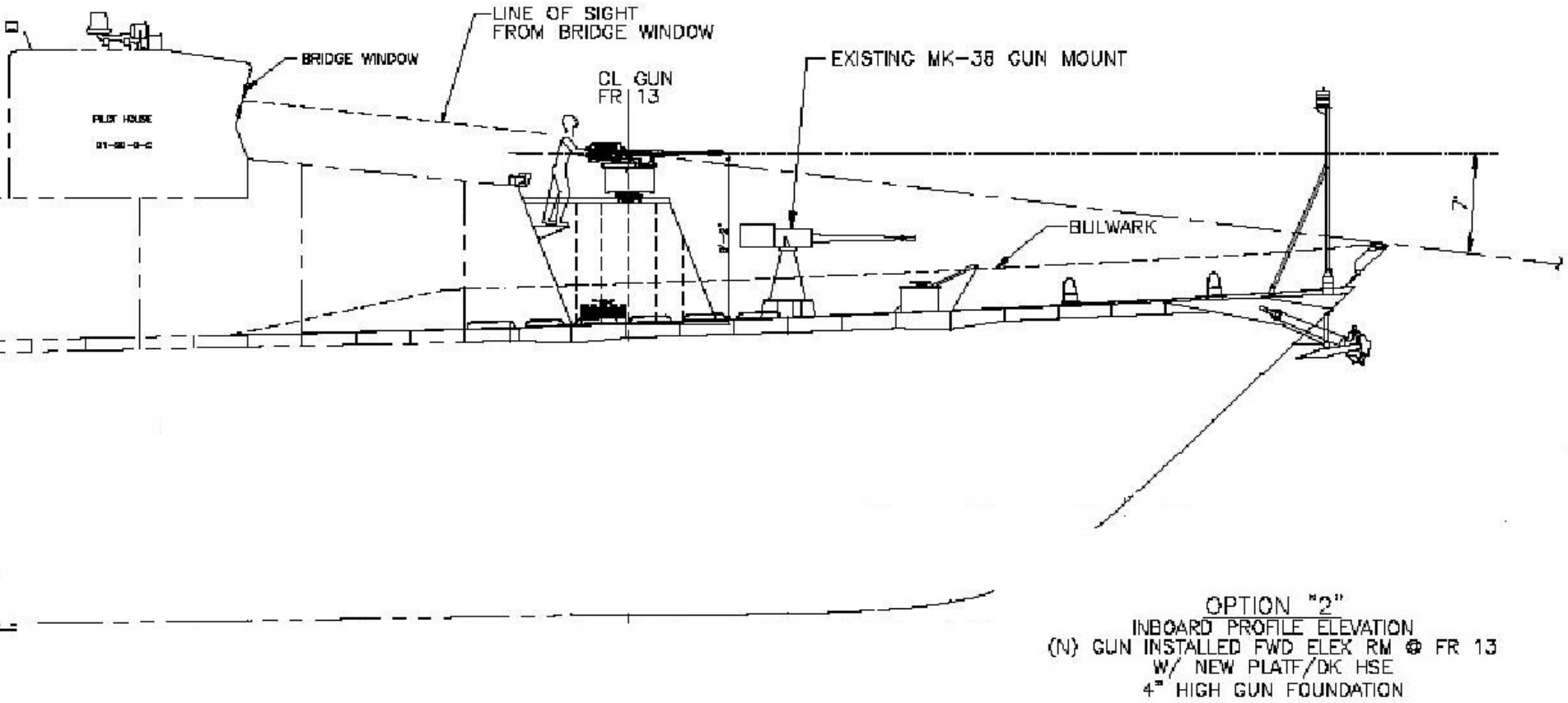
3D MODEL ISOMETRIC VIEW



3D MODEL PROFILE VIEW

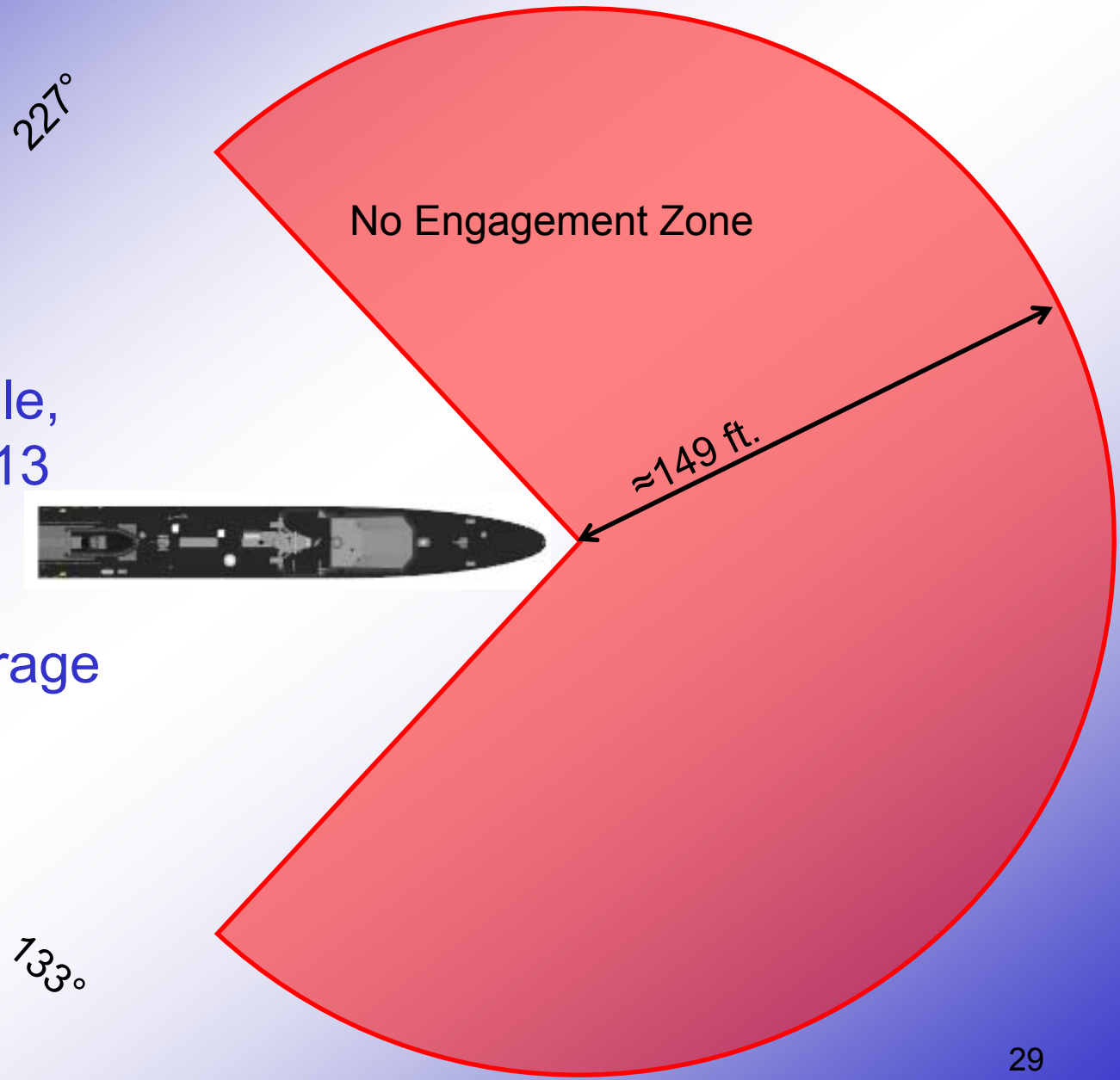


PILOT HOUSE VIEW



OPTION "2"
INBOARD PROFILE ELEVATION
(N) GUN INSTALLED FWD ELEX RM @ FR 13
W/ NEW PLATF/DK HSE
4" HIGH GUN FOUNDATION

- 7° Depression Angle,
- Located at Frame 13
- Gun Barrel 9' 2" above Main Deck,
- 266° Overall Coverage



Path Forward

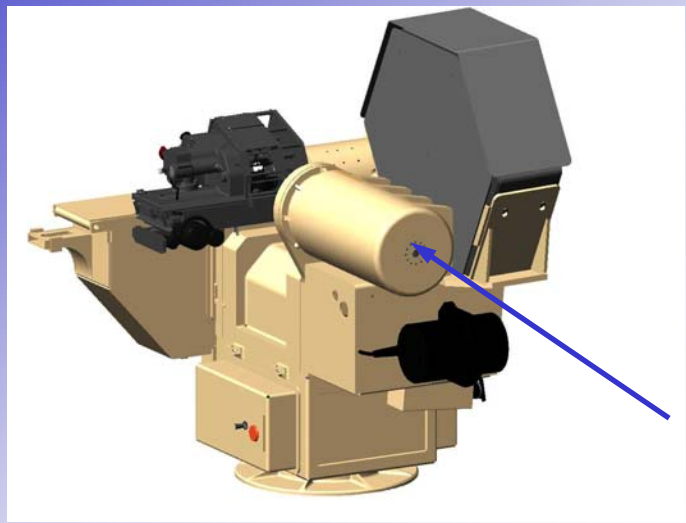
Patrol Coastal At-Sea Demonstration

- Funded by IWS3C, Mr. Kevin LaPointe
- Supported by PCRON, Commodore Coughlin
- Objectives
  - Safely demonstrate the advantages the MK 45 Weapon System
    - Optics
    - Remote operation
    - Stabilization
    - Location improvement
    - Ability for ship's crew to remove and stow the cannon
- Schedule
  - TEMPALT SIDs finalized by 15 May
  - Install TEMPALT 01-24 June 09
  - Install MK 45 31 Aug – 4 Sept 09
  - Demonstration 14-25 Sept 09

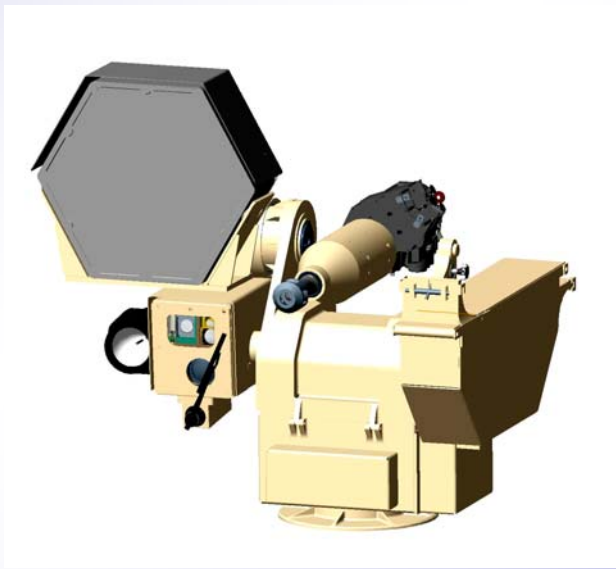
Additional Features Under Consideration

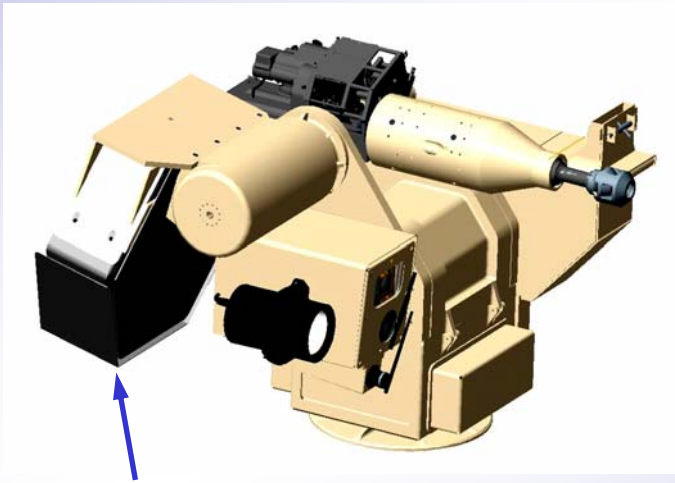
Modular Advanced Weapon System (MAWS)

Auxiliary Drive



Auxiliary Elevation Drive





Stowed Position

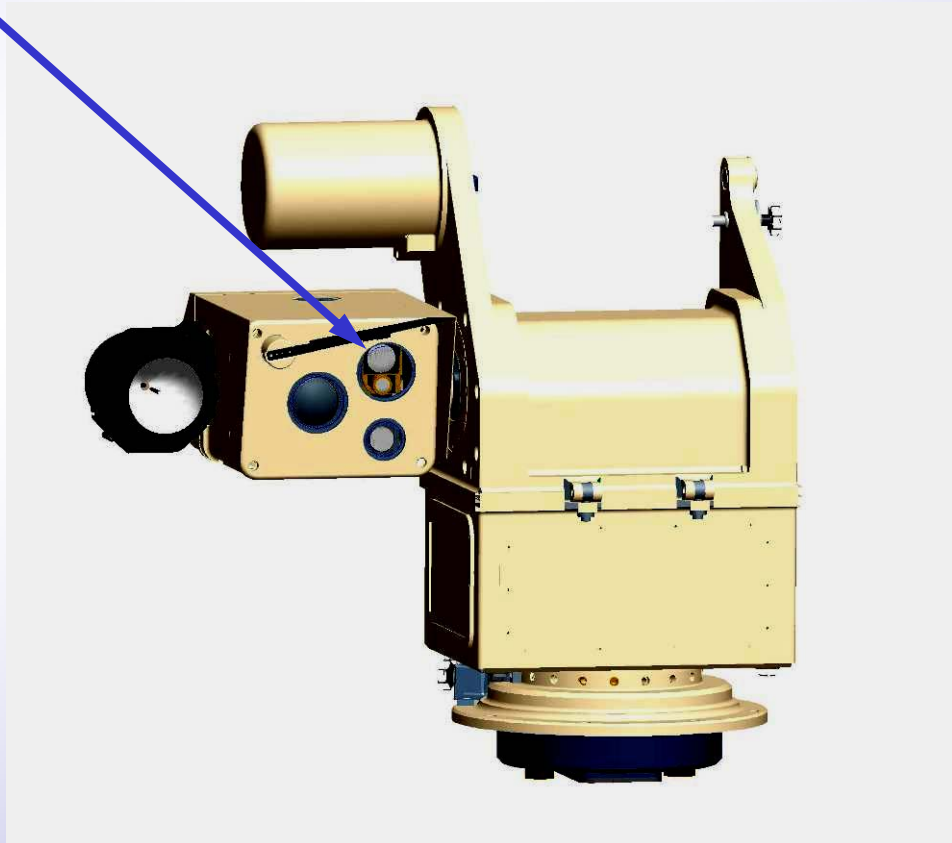
Proposed configuration for NEO Spiral 2

to support escalation of force initiative

Modular Advanced Weapon System (MAWS)

Laser Designator/Sight Improvements

- Integrate a combination ELRF and designator into the current sight package
- Add an azimuth drive system for the sight to improve the stabilization of the sight
  - Verify accurate designation
  - Allow active target leading



Modular Advanced Weapon System (MAWS)

Missile Options