



# DP | PROGRAMS & INTEGRATION

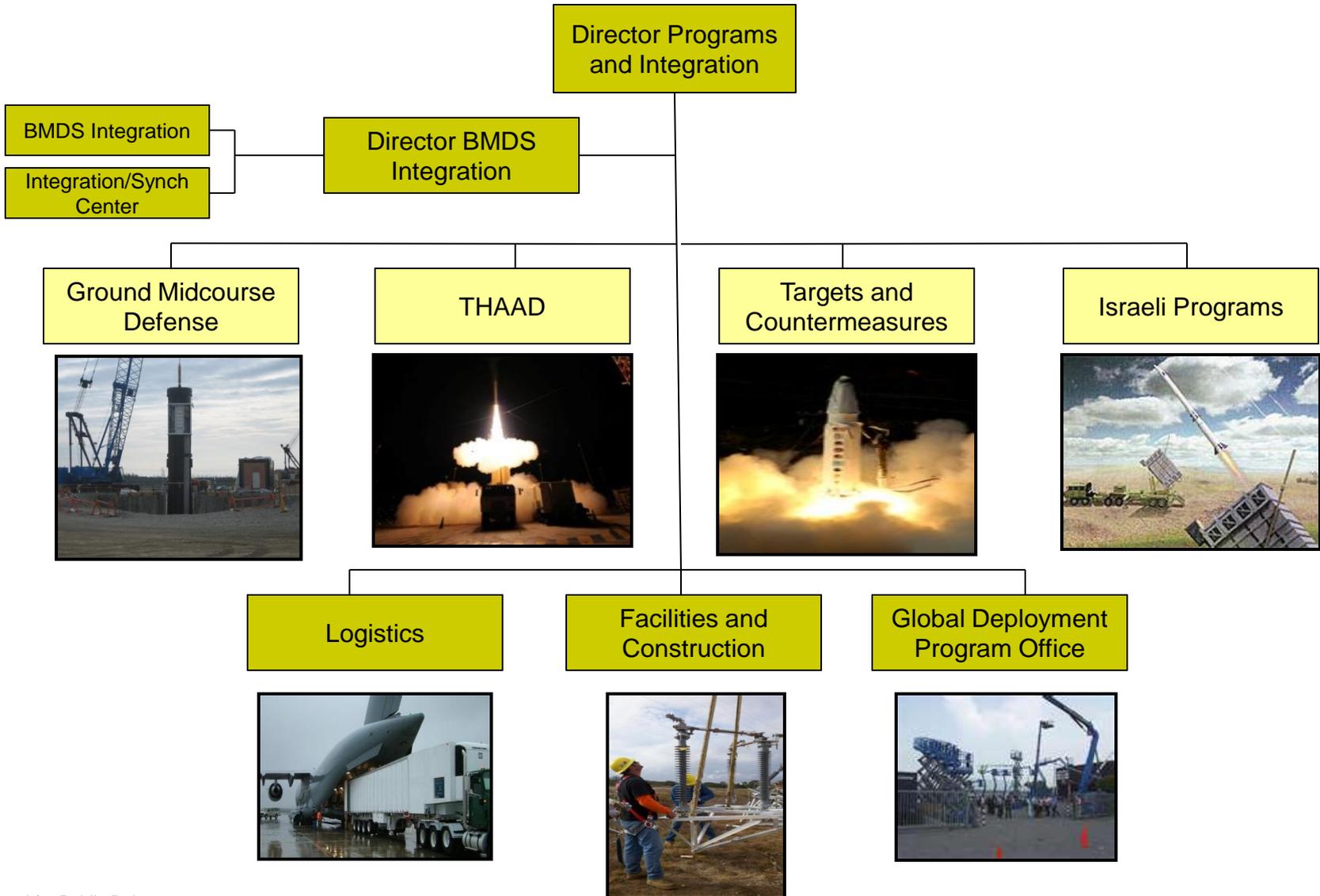
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# Programs and Integration Organization

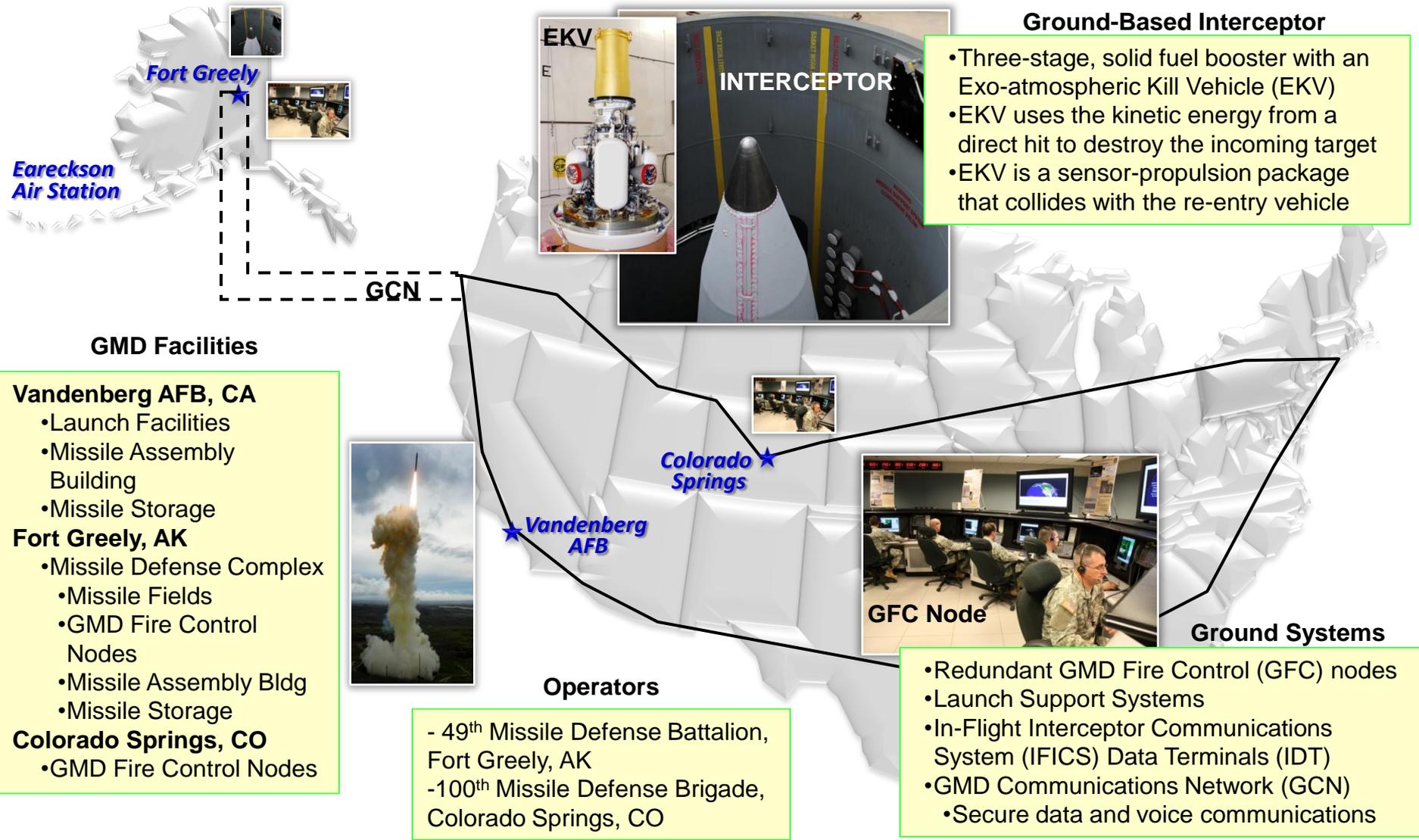




# Ground-Based Midcourse Defense (GM)



# Ground-Based Midcourse Defense (GMD)





# GMD Focus Area – Interceptor Opportunities

## ✓ Missile Aging and Reliability Prediction

- Effort Required
  - Develop Method to Increase Reliability, Availability, and Maintainability for GM interceptors
  - Develop Advanced Reliability Assessment Techniques to Complement Acceleration Aging Methodologies

## ✓ Signature Exploitation for Long Range Objects

- Effort Required
  - Develop Techniques to Discriminate Lethal Objects from Non-lethal Objects in Complex Environment

## ✓ System Safety for Flight Test Interceptor

- Effort Required
  - Develop an independent means of assessing interceptor vehicle position via a GPS System for Range Flight Safety
  - Develop and demonstrate an improved flight safety system to follow the Translated Global Positioning System (TGRS), with specific emphasis on the hardware used on the flight vehicle, more commonly referred to as the Digital GPS Translator (DGT)



# GMD Focus Area – System Opportunities

## ✓ Operations and Sustainment Support

- Effort Required
  - Operations and Sustainment Support at Operational Sites
  - System Maintenance

## ✓ Test Analysis and Reporting for MDA Flight and Ground Tests

- Effort Required
  - Analyze software capability performance for reducing risk and affirming correct operation in MDA flight and ground tests

## ✓ Risk Management

- Effort Required
  - Engineering assessment of ground systems interceptor and test risks



# Israeli Programs (IP)



# Missile Defense Agency U.S. – Israeli Cooperative Program Office (MDA/IP)

## Mission

Co-Manage MDA Cooperative Missile  
Defense Development Programs with Israel

## Programs

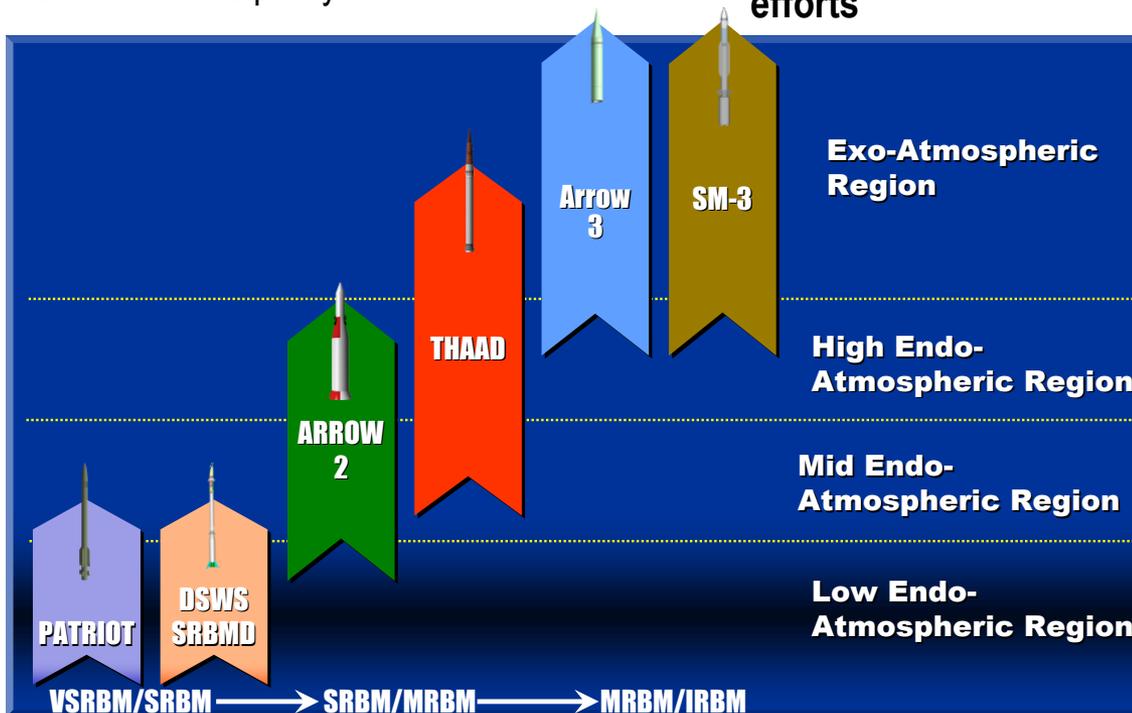
- **Arrow System Improvement Program (ASIP)**
  - National Missile Defense System for Israel
  - Arrow Missile Production Program (AMPP)
  - Israel System Architecture & Integration (ISA&I)
  - Israel Test Bed (ITB)
- **Upper-Tier Interceptor (Arrow-3)**
  - Upper-Tier Interceptor to Enhance AWS Robustness Against Advanced Threats
- **David's Sling Weapon System (DSWS)**
  - Short Range Missile Defense





# U.S.-Israeli Programs: Contributions to the BMDS

- **U.S. – Israel Cooperative Program contributes to two MDA Strategic Goals**
  - **Goal 2:** Enhance missile defense to defend our deployed forces, allies, and friends against regional threats including defeating large raid sizes and intercepting early in flight
  - **Goal 6:** Expand international cooperation and development of missile defenses in accordance with national defense policy
- Provides Multi-Tier BMD capability across the spectrum of regional BM threats
- Maximizes effectiveness of combined U.S. – Israel BMD operations through Link 16 interoperability with the Ballistic Missile System Defense System (BMDS)
- Provides BMD intercept phenomenology and other technical benefits to assist in BMDS development efforts





# Israeli Program – Focus Areas

- Focus Areas:
  - Actuators
  - Safe & Arm Devices
  - Shrouds
  - Flexible Seals
  - Pressure Vessels
- Focus technologies should reduce cost, reduce weight, minimize volume, increase performance, increase reliability, and improve producibility.
- Technical Assistance Agreement / Export Control are unique challenges for Small Business
  - Team with U.S. Primes (Boeing and Raytheon)
  - Utilize Freight Forwarders or other professional organizations to guide through process
- Opportunities are widely applicable to US programs



# IP Focus Areas - Opportunities

- ✓ **Actuation systems** - Innovations that reduce weight, increase response and ultimately reduce power requirements to the vehicle.
- ✓ **Electronic Safe and Arm** - Advances in electronics and pyrotechnic systems that can drive safer, smaller, more reliable, multi use devices for the future that feature miniaturization and redundancy.
- ✓ **Flexible Seal** - This critical component in the maneuvering capability of the interceptor needs improved stiffness profile to improve seal reliability. Lower stiffness reduces actuator requirements and power requirements to the vehicles and improves response times.
- ✓ **High pressure vessel** – Explore applications using composites for helium/nitrogen applications up to 20,000 psig and beyond to determine the weight benefits.



# Terminal High Altitude Air Defense (THAAD)



# THAAD Mission and Capabilities

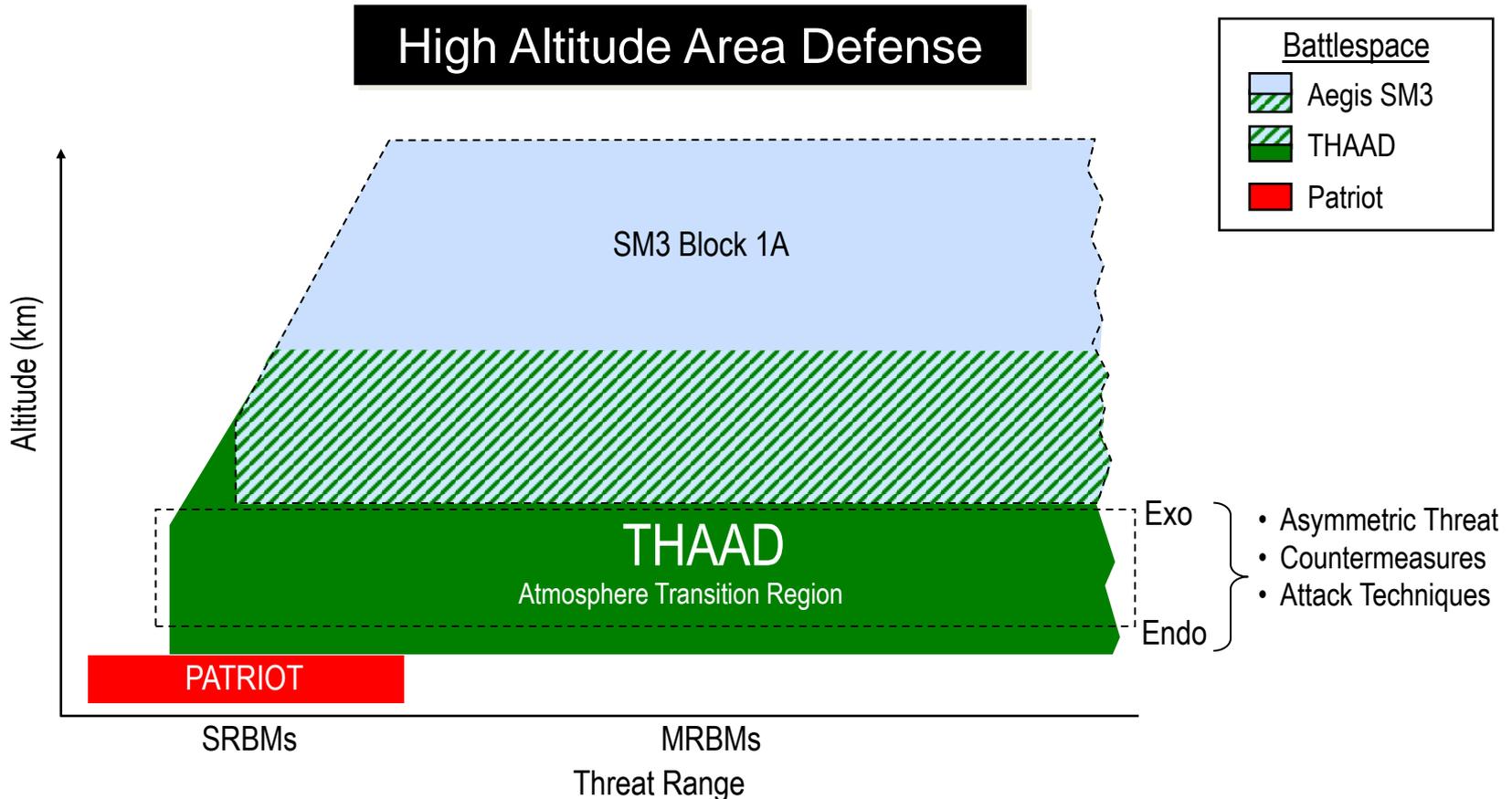
- Defend against short and medium range ballistic missiles
- High firepower and sustainability for resistance to mass attack
- Endo and Exo atmospheric intercept capability
- High lethality with proven hit-to-kill
- Production contract for Batteries 3, 4 awarded on 11 March 2011

***THAAD Provides Unique and Cost-Effective Capabilities  
for Critical Ballistic Missile Defense Missions***



# THAAD Unique Battlespace

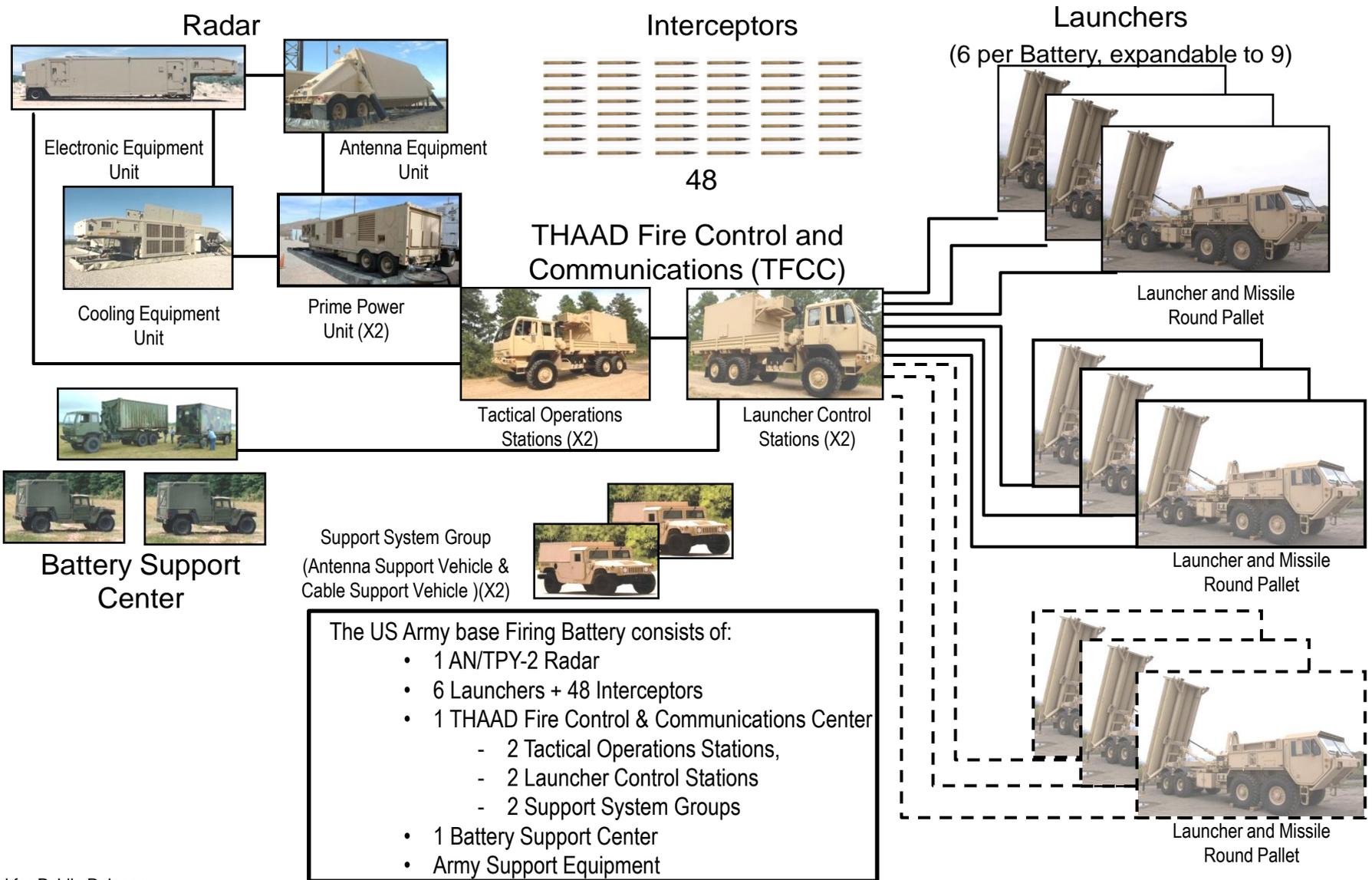
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*THAAD Fills The Gap Between Low-Exo and High-Endo With High Probability of Kill*



# THAAD Battery Configuration





# THAAD Focus Area – Production, Operations & Sustainment Opportunities

- ✓ **Fault Detection Diagnosis, and Recovery (FDDR) field unit**
  - Effort Required
    - Comprehensive model of Ground and Missile components
    - Robust and lightweight handheld electronics unit for use in the field
  
- ✓ **Obsolescence Modeling**
  - Effort Required
    - Develop predictive forecast and cost model
    - Develop automated database for tracking and sustainment
  
- ✓ **Missile Aging and Reliability Prediction**
  - Effort Required
    - Develop Method to Increase Reliability, Availability, and Maintainability for THAAD interceptors
    - Develop Advanced Reliability Assessment Techniques to Complement Acceleration Aging Methodologies



# THAAD Focus Area – Ground Systems Opportunities

- ✓ **Universal Power Supply** - Designed for compact form/high power output for long duration (hrs)
  - Effort Required
    - Develop Universal Power Supply (UPS) for future use in TFCC
  
- ✓ **Computer Display** - Designed to be ergonomic and best utilize the tactical station
  - Effort Required
    - Develop tactical station display for future use in TFCC
  
- ✓ **Hypergolic Propellant Leak Detector** - Designed to be highly reliable with minimal footprint
  - Effort Required
    - Develop Hypergolic propellant leak detector for future use with the THAAD Launcher
  
- ✓ **Missile Round Ship Set** - Used to ship test missiles for flight and ground tests
  - Effort Required
    - Develop a steel and aluminum structure; 23'x36"x36"; 3,400 lbs loaded, 750 lbs empty for use with the THAAD Interceptor



# Targets and Countermeasures (TC)



# Targets and Countermeasures Program Goals

**Develop a common cost-effective family of Target solutions with systematic rigor that delivers quality targets for BMDS testing**

- 1. Produce solutions based on common and flexible components.**
- 2. Modify a standard set of targets to meet specific threat requirements.**
- 3. Deliver reliable, threat representative targets to inventory.**
- 4. Develop specialized target expertise and retain a talented, professional workforce.**
- 5. Develop efficient and effective processes that provided integrated information.**



*Air Launch*



*Sea Launch*



*Ground Launch*



*Multipurpose Reentry Vehicles,  
And countermeasures*



# TC Focus Area – Target Characteristics Opportunities

- ✓ **Develop tool suite to develop and accurately characterize the RF signatures of target objects**
  - Effort Required
    - Demonstrate Feasibility and Develop Plan to Mature Technique
    - Implement Plan, Demonstrate Ability to Produce RF Signature Data, Characterize Performance and Accuracy with Real Data
    - Refine Methodology and Software for Transition to MDA Platforms
  
- ✓ **Design and test low observable, multi-band telemetry antennas for use on BMDS targets**
  - Effort Required
    - Demonstrate Antenna Design RCS Signature Reduction via Modeling
    - Develop Antenna System Prototype and Conduct Measurements to Anchor Model
    - Transition to Specific Platforms, Perform Flight Qual Testing, and Transition to Flight Program



# Focus Area – Target Characteristics Opportunities

## ✓ Passive Techniques for Flight Reconstruction Data

- Effort Required
  - Demonstrate Feasibility by Simulation, Provide Assessments on RCS and IR Signatures
  - Develop Ground Test Prototype for Signatures Assessment, Perform Ground Testing, Outline and Address Manufacturing Issues, Develop Tool to Enable Data Post-Processing

## ✓ Techniques for Anchoring Debris Models

- Effort Required
  - Develop Concept for Data Collection within the Motor, Demonstrate in the Model Time-Dependent Location of Debris, Demonstrate Ability to Image Debris as it Exits Nozzle, and Develop Plan for Implementing Imaging System in Hardware
  - Implement Prototype Imaging System and Associated Test and Data Collection Software to Support Ground Test Motor Firing
  - Mature Prototype to Flight Ready Status and Perform Data Collection During Flight Test and Post-Process Data to Form a Scene Image of the Motor Post Burn-Out



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# Infrastructure and Environment (DPF)



# DPF Mission

**Provide, operate, and sustain assets, infrastructure, and services in a cost-effective manner to support the MDA mission, while ensuring environmental compliance and enhancing the safety and quality of the workplace**



# Field Activity Operations

- Provide Field Activity operations for each major geographic area supported:
  - National Capital Region
  - Dahlgren
  - Huntsville Field Activity
    - Redstone Arsenal
    - Huntsville
    - Research Park Locations



# Goods and Services - Opportunities

## ✓ Goods (Purchase, Lease, and Rental)

- Equipment - Office and Industrial
- Supplies - Consumable Office and Industrial
- Furniture (Case Goods and Systems)

## ✓ Services

- Maintenance Contracts/Agreements (Copiers, HVAC, etc)
- Manpower requests for installations (Equipment, Furniture), Minor Construction, Office Relocations, etc.
- Other Services as needed



# Focus Area – Procurement

- ✓ **Von Braun IV Redstone Arsenal, AL**
  - Effort Required
    - Executive Line Furniture
    - Receiving, Warehousing and Installation of Executive Line Furniture
  
- ✓ **Maintenance Agreements**
  - Effort Required
    - Warehouse Lift Equipment
    - Uninterruptable Power Supplies
    - Air Conditioning
  
- ✓ **Blanket Purchase Agreements (BPA's)**
  - Effort Required
    - General Office Supplies
    - Printer/Copy Paper



# BACK-UP



# Back-Up

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## BMDS Video