



To: Huntsville Aerospace Marketing Association

**By: Shari Feth, Ph.D
Director,
Innovation, Science & Technology
Missile Defense Agency
August 13, 2021**

DISTRIBUTION STATEMENT A. Approved
for public release; distribution is unlimited.

Approved for Public Release
21-MDA-10915 (10 Aug 21)

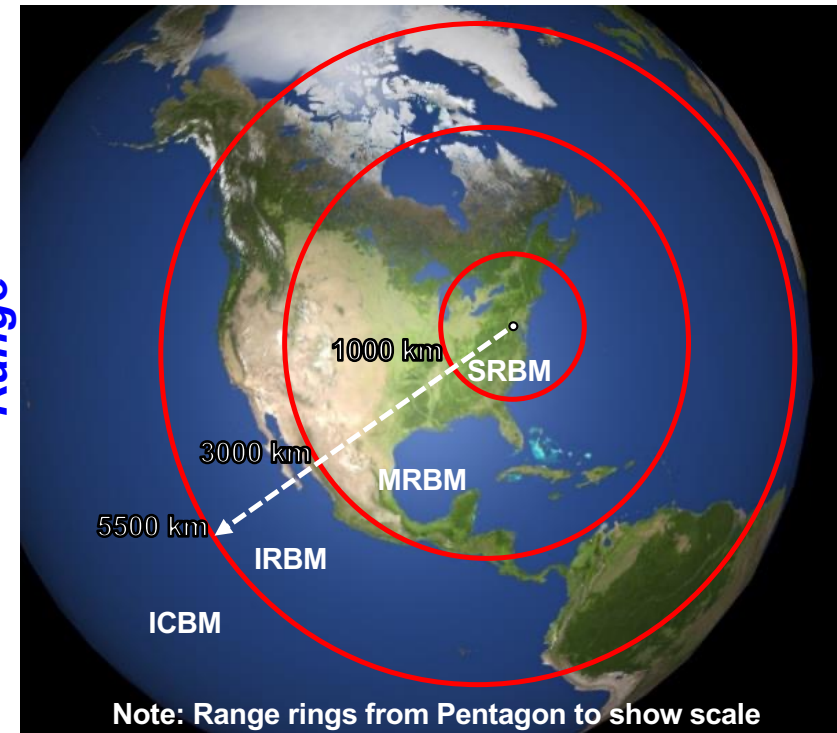


Missile Defense Evolving Threat Environment

Adversaries are fielding diverse and expansive ranges of modern offensive missile systems

- Developing new missiles & improving existing systems
 - Precision strike
 - Penetration aids (e.g. decoys, jamming devices)
- Capable of maneuvering in midcourse or terminal phase
 - Maneuvering Reentry Vehicle (MaRV)
 - Multiple Independent Reentry Vehicle (MIRV)
 - Hypersonic Glide Vehicle (HGV)
 - Long Range Cruise Missiles (Defense of Homeland)

Range



Note: Range rings from Pentagon to show scale

SRBM: Short Range Ballistic Missile	(300-1000 km :: 621 mi)
MRBM: Medium Range Ballistic Missile	(1000-3000 km :: 1864 mi)
IRBM: Intermediate Range Ballistic Missile	(3000-5500 km :: 3418 mi)
ICBM: Intercontinental Ballistic Missile	(5500+ km :: 3418+ mi)

Speed

Subsonic:	< Mach 1	(< 770 mph)
Supersonic:	Mach 1-5	(770-3,800 mph)
Hypersonic:	Mach 5-10	(3,800-7,700 mph)
High Hypersonic:	Mach 10-25	(7,700-19,200 mph)

Ref: 2019 Missile Defense Review



North Korea
Hwasong-15 ICBM



Iran
Emad-1 MRBM with MaRV



China
Dong Feng (DF-26) IRBM



Russia
Concept Hypersonic Glide Vehicle



Missile Defense Agency Mission

To develop and deploy a **layered** Missile Defense System to **defend** the United States, its deployed forces, allies, and friends from missile attacks in **all phases** of flight



**Missile Defense Capability
Globally Deployed**



Missile Defense Agency Priorities

In Support of the National Defense Strategy



Support the Warfighter

Augment Service Readiness, Logistics Support, Training, and Lifecycle Sustainment



Develop and Deliver the Missile Defense System

Focus on Increasing Lethality, Building Out Missile Defense Force Structure, and Deploying Credible Deterrence



Outpace the Evolving Threat

Develop Architectures that Challenge Adversary Capabilities, Quickly Mature Promising Technologies, Deliver with Speed



“A robust and credible layered missile defense system paired with our conventional and nuclear force capabilities provides the ability to deter strategic attacks, deny benefits, and impose costs against any potential adversary.”

-- Admiral Charles A. Richard, U.S. Strategic Command



Today's Layered Active Missile Defense System

C2BMC Command and Control, Battle Management and Communications

NMCC USSTRATCOM USNORTHCOM USINDOPACOM USEUCOM USCENTCOM USSPACECOM

BOOST
Defense Segment

ASCENT/MIDCOURSE
Defense Segment

TERMINAL
Defense Segment

**The System
Of Elements**

GBI
Ground-Based
Interceptor

SM-3 IIA
Standard
Missile

SM-3 IA/IB
Standard
Missile

THAAD
Terminal High
Altitude Area
Defense

SM-6
Standard
Missile

Aegis
Sea-Based
Terminal

PAC-3
Patriot Advanced
Capability

GMD
Ground-based
Midcourse
Defense

**Aegis
Ship & Ashore**
Ballistic Missile
Defense

Sensors



Satellite Surveillance
BMDS OPIR Architecture



Upgraded Early
Warning Radars



Forward-Based
Radars



Aegis BMD
SPY Radars



Discriminating
Radars



MDA Areas of Interest

- **Battle Management Command & Control (BMC2)**
 - Need for Artificial Intelligence (AI) solution(s) for Collaborative Decision Making; particularly for confusing & information constrained engagements
 - Aid warfighter interpretation of information with explainable AI prototype concepts, algorithms, and operator interfaces
- **Communications**
 - Utilization of 5G/6G for future Communications through put and interoperability
 - Over-the-Horizon In-Flight Target Update to minimize ground based facilities
 - Multivendor Component integration for next gen Communications to maximize interoperability
 - High Volume Multifunction Advanced Data Link implementations for flexible Communication entry and exit points
 - Improved Latency & Early Warning for Global Communications
 - Low Earth Orbit (LEO) Internet Commercial Satellite System to enable improved left-through-right of launch integration
- **Cyber**
 - Automate integration & exploitation of left-of-launch data to enable improved left-through-right of launch integration
- **Electronic Warfare (EW)**
 - Utilization of EW assets to augment probability of kill for dual purpose use



Commercial Launch of Nanosat



Command and Control



Networked Nanosats



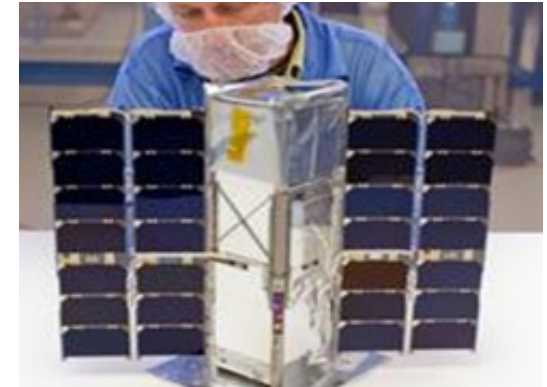
MDA Areas of Interest

- **Sensor**

- Very high-resolution synthetic aperture data as a service provider (commercial Imaging) to enable improved left-through-right of launch integration
- Improved discrimination and data fusion to enable higher probability of identifying the lethal object and more efficient use of interceptors
- Reconfigurable Focal Plane Arrays (FPAs) that are adaptable to varying scenes
- Large Format, High Dynamic Range Digital Read-Out Integrated Circuits. 2-Color FPAs that are adaptable to varying scenes
- Force Engagement and Sensor Coordination

- **Weapon**

- High Temperature Window Materials
- Lightweight Structures
- Hybrid Propulsion systems
- Low SWAP Laser Transition and Long range Active Tracking Technology
- Laser scaling



Nanosat



Aegis



TPY-2 Radar



MDA Challenges

- **Technically**
 - Ballistic Missile capability proliferation
 - Hypersonic missiles Mach 5+
 - Sense, track, calculate & intercept window gets shorter
 - Cyber security
 - Battlefield superiority (AI/ML, MOSA (Modular Open System Architecture), Digital Engineering, DevSecOps, etc.)
- **Contractually**
 - Shortening the timeline from announcement to contract award
 - Responding to Broad Agency Announcements and proposals:
 - Read the entire announcement and requirements
 - Follow instructions on <https://beta.sam.gov>
 - Non-traditional options
 - Non-traditional partners
 - Cost sharing
- **Operationally**
 - Ready to respond 24/7/365 by land, sea, air & space
 - Constant software and hardware upgrades
- **Internationally**
 - Cost sharing and increasing the capacity, having new, innovative solutions, upgrades



NOTIONAL
Hypersonic Glide Vehicle



Terminal High Altitude Area Defense



NOTIONAL
Hypersonic Cruise Missile

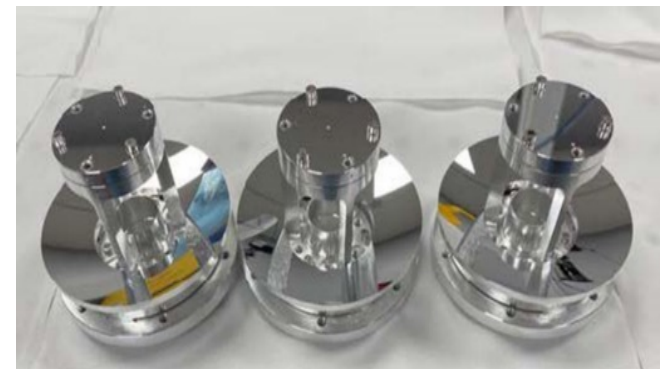


How Industry can help MDA

- **Manufacturing**
 - Computer chips
 - Diminishing domestic manufacturing capacity
 - Obsolete materials
 - Radiation hardened products
 - Miniaturization to reduce size, weight and power
- **Processes**
 - New innovative ways to make materials/components
- **Procurement**
 - Faster response to needs (not just the old Federal Acquisition Regulation method)
 - Cooperative Agreements
 - Other Transactions



Additively Manufactured Component



Pre-test Prototype Aluminum Telescopes



What is a Broad Agency Announcement ?

- **What is the Broad Agency Announcement (BAA)?**
 - A tool used by government agencies for acquisition of basic and applied research and that part of development not related to the development of a specific system or hardware procurement
 - A general announcement of MDA's research interest including criteria for selection and soliciting the participation of all offerors capable of satisfying the Government's needs
 - Technology Readiness Level 1-5
- **How is the BAA used?**
 - Used by agencies to fulfill requirements for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding rather than focusing on a specific system or hardware solution
 - When meaningful proposals with varying technical and scientific approaches can reasonably be foreseen



MDA's Innovative Broad Agency Announcement Research Areas of Interest

- **Radar and Radio Frequency (RF) Sensor and Communication Systems**
- **Electro-Optical/Infrared Sensor and Communication Systems**
- **Directed Energy Systems**
- **Computer Science, Signal and Data Processing**
- **Algorithms, Probability and Decision Theory**
- **Materials and Processing**
- **Phenomenology**
- **Interceptor and Space Systems**
- **Modeling and Simulation (M&S)**
- **Artificial Intelligence including Machine Learning and Big Data**
- **Cyberspace Operations, Cybersecurity, and Cyber resiliency of Large Scale Distributed Weapon Systems**
- **International Missile Defense System Cooperation**
- **Microelectronics/digital**



BAA Eligibility and Submission

- All qualified offerors who meet the requirements of the Broad Agency Announcement are eligible to participate
 - Private Industry (large, medium, and small businesses)
 - Qualified accredited domestic educational institutions
 - Non-profit organizations
 - Commercial contractors
- To participate, eligible offerors must submit a white paper
 - The MDA I,S&T BAA No. HQ080-21-S-0001 (released 30MAR21) requires a white paper limited to 10 pages in length on 8.5"x11" paper which should describe how your ideas may enhance the product, improve the process, or address the techniques, methods, materials that will meet the Government's needs
 - Write to stated requirements/criteria
- BAAs posted at: <https://beta.sam.gov>



How Are White Papers Evaluated & Selected for Award?

White papers will be evaluated against the criteria stated in the announcement



Evaluation is based on a scientific review against individual merits rather than against each other



White papers will be selected for award based on technical merit, importance to agency programs and funding availability



MDA reserves the right to award all, a portion of, or none of the white papers



Awards may occur anytime during the BAA open period; Awards are subject to successful negotiations and availability of funds



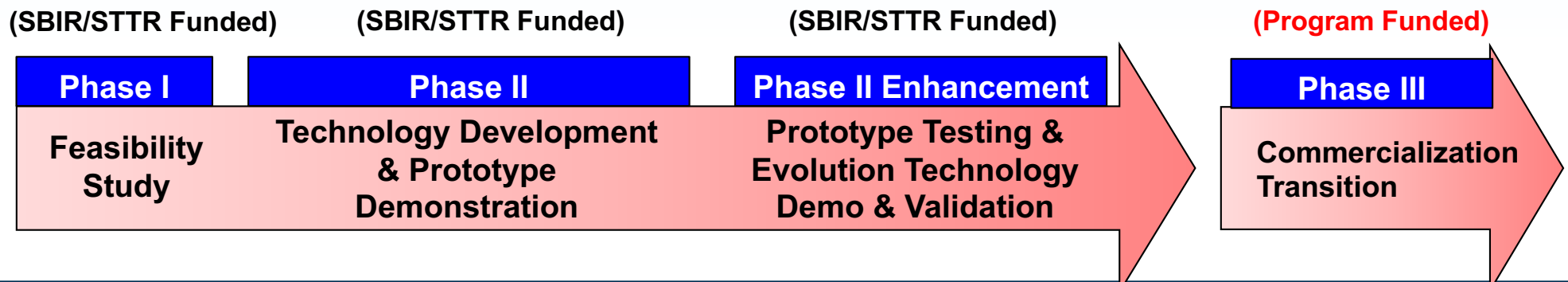
Other Opportunities

- In addition to Broad Agency Announcements, MDA has opportunities for industry to participate in:
 - **Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR)**
 - Eligibility Submission
 - Must be Certified by the Small Business Administration (SBA) as a small U.S. business
 - Opportunities can be found at:
 - DoD SBIR/STTR website: <https://sbir.defensebusiness.org>
 - SBA SBIR/STTR website: <https://www.sbir.gov>
 - MDA email: SBIRSTTR@MDA.MIL
 - SBIR/STTR evaluated using the same/similar process to BAAs
 - **Request for Information (RFI)** and **Request for Proposals (RFP)** are released on or as-needed basis with specific requirements or as stated in proposal



Small Business Innovative Research / Small Business Technology Transfer

- **Eligibility Submission** - **Must be Certified by the Small Business Administration (SBA) as a small U.S. business**
- **Opportunities can be found at:**
 - **DoD SBIR/STTR website:** <https://sbir.defensebusiness.org>
 - **SBA SBIR/STTR website:** <https://www.sbir.gov>
 - **MDA email:** SBIRSTTR@MDA.MIL
 - SBIR/STTR's are evaluated using a similar process to BAAs
- **SBIR / STTR program is a four step process**
 - **Phase I: Feasibility and concept development**
 - **Phase II: Technology and prototype development**
 - Technology efforts may receive one sequential Phase II contract
 - **Phase II Enhancement: Prototype testing and technology demonstrations & validation**
 - **Phase III: Commercialization and Transition**





MDA Forecasted Request for Information and Requests for Proposals

- **Request for Information (RFI)** and **Request for Proposals (RFP)** are released on or as-needed basis with specific requirements or as stated in proposal

Program Office	Description
<i>Proposed Jul – Sep 2021</i>	
Aegis	BMD 6.0 Re-Phase Contract Modification*
Aegis	Flight Test Support Mathematical Algorithm Development Contract Modification*
Consolidated Support Program Office	TEAMS-Next Administration
Consolidated Support Program Office	TEAMS-Next IT & Cybersecurity Management
Consolidated Support Program Office	TEAMS-Next Security Ops and Counterintelligence
Consolidated Support Program Office	TEAMS-Next Specialized Engineering Analysis
Consolidated Support Program Office	TEAMS-Next Facilities Life Cycle Management
Ground-Based Midcourse Defense	GMD – System Integration, Test & Readiness
Ground-Based Midcourse Defense	GMD – Exo-atmospheric Kill Vehicle Sustainment Contract*
Ground-Based Midcourse Defense	GMD – Weapon System
Mission Support	Mission Support Logistics - Operations
Terminal High Altitude Area Defense	THAAD Product Support Foundation Task Order*
Terminal High Altitude Area Defense	UAE - THAAD Config3/4.0 Software Integration*

*Sole Source



For More Information and Opportunities

Go to: www.mda.mil to learn more about:

- Missile Defense News, Images, Videos, Fact Sheets
- Missile Defense System Overview, Ballistic Missile Defense Basics
- MDA Business Opportunities: https://www.mda.mil/business/advanced_research.html
- DoD SBIR/STTR website: <https://sbir.defensebusiness.org>
- SBA SBIR/STTR website: <https://www.sbir.gov>

To Contact MDA:

SBIR / STTR:

sbirsttr@mda.mil

256-955-2020

University Research / BAA:

AdvancedResearch@mda.mil

256-450-3800

Commercialization:

SBIR-PhaseIII@mda.mil

256-450-5343

- Search for MDA BAA's, RIF's and RFP's, & other government opportunities at :
<https://beta.sam.gov>
- It is the offeror's responsibility to monitor websites for updates and/or amendments

STELLAR TEAM

NOBLE MISSION

