

MISSILE DEFENSE AGENCY



FISCAL YEAR (FY) 2024 BUDGET ESTIMATES OVERVIEW



MISSILE DEFENSE AGENCY

FISCAL YEAR 2024



MISSION

The Missile Defense Agency (MDA) mission is to develop and deploy a layered integrated missile defense system to defend the United States, its deployed forces, allies, and friends from missile attacks in all phases of flight. The MDA designs, develops, and delivers capabilities through the Services to meet Combatant Command joint requirements, while also sustaining advanced missile defense systems as part of the fully integrated and layered missile defense system.

MDA’s budget request for Fiscal Year (FY) 2024 is \$10.9 billion. The FY 2024 budget will continue the development, rigorous testing and fielding of reliable, increasingly capable, advanced missile defenses. The Agency’s priorities for missile defense are:

- 1) Operations and Readiness,
- 2) Production, Fielding, and Deployment, and
- 3) Technology, Development, and Test



MDA will continue to collaborate closely with Combatant Commanders (CCMDs) and the Services to support current and future needs for missile defense capabilities. MDA and these key stakeholders are leveraging the existing all-domain missile defense system to develop integrated architectures and capabilities to counter the evolving missile threat from ballistic, hypersonic and cruise missiles. This budget request maintains operational missile defense capacity and capabilities for existing homeland and regional defense forces; increases interceptor inventory and maturation of defensive technologies; and improves existing sensors and the Command and Control, Battle Management and Communications (C2BMC) system.

In accordance with the National Defense Strategy, the Missile Defense Review, and the Defense Planning Guidance, MDA’s budget includes funding for improving homeland ballistic missile defense architectures to protect against intercontinental ballistic missile (ICBM) threats from North Korea and potentially Iran. This budget also continues investment in regional missile defense capabilities to defend forward deployed forces in partnership with friends and allies.

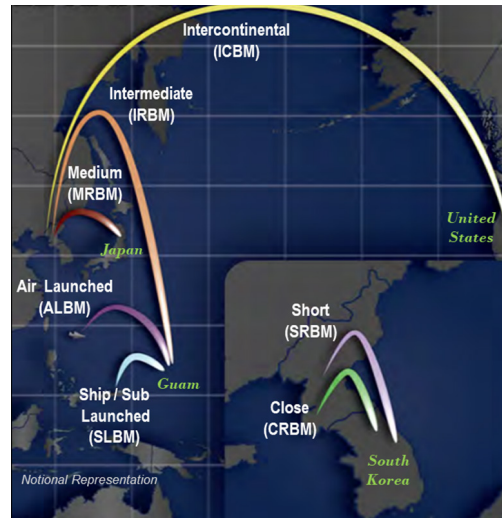
In the regional context, United States (U.S.) missile defense policy promotes the development and deployment of missile defense capabilities to counter the full range of regional missile threats (e.g., advanced ballistic, hypersonic, and cruise missiles) from any nation of origin, to include advanced regional missile threats from the People’s Republic of China and Russia. In response to increasing threats in the Indo-Pacific region, MDA is supporting efforts to improve the Warfighter's capability to defend Guam against regional ballistic, and cruise missiles. FY 2024 funding will support activities to continue development and deployment of an effective defensive architecture solution.

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MDA continues to make significant progress in cybersecurity by incorporating threat-informed requirements for cyber resiliency and survivability into system specifications and then implementing rigorous evaluation-based testing and assessments early in the development to find and fix problems before releasing systems for integrated testing. MDA is building cybersecurity into next-generation software processes by leveraging proven secure software development, security, and operations, and establishing continuous integration. MDA established a Defensive Cyberspace Operations organization, which uses certified cyber teams to evaluate capabilities to enhance our cybersecurity posture.



MISSILE THREAT

Missile threats continue to increase, growing more numerous and complex. Adversary missile systems are becoming more mobile, survivable, reliable, and accurate while also achieving longer ranges. Hypersonic glide vehicles delivered by missile boosters are an emerging threat that pose new challenges to missile defense systems. Adversary missile pre-launch survivability is likely to increase as potential adversaries strengthen their denial and deception measures and increasingly base missiles on mobile platforms. Increasing technical and operational countermeasures continue to challenge defensive systems in missiles. New missile systems feature multiple independently targetable reentry vehicles and maneuverable reentry vehicles, along with decoys and other countermeasures. Ballistic and maneuvering missile threats continue to increase with the advancement and proliferation of missile technology.



Russian ship launches Tsirkon Hypersonic Cruise Missile (HCM).

As demonstrated recently by Russia in Ukraine and attacks on both the Kingdom of Saudi Arabia and the United Arab Emirates, missiles continue to be a primary tool for adversaries in times of conflict. Russia and China are developing advanced cruise missiles that can be launched from air, maritime, and land-based platforms. Maneuvering missiles, such as hypersonic glide vehicles, provide a challenge to existing defensive systems because they can travel on unpredictable flight paths at low altitudes making them difficult to track using standard terrestrial radar systems. Consequently, the continued investment in development of long range and resilient sensor technologies

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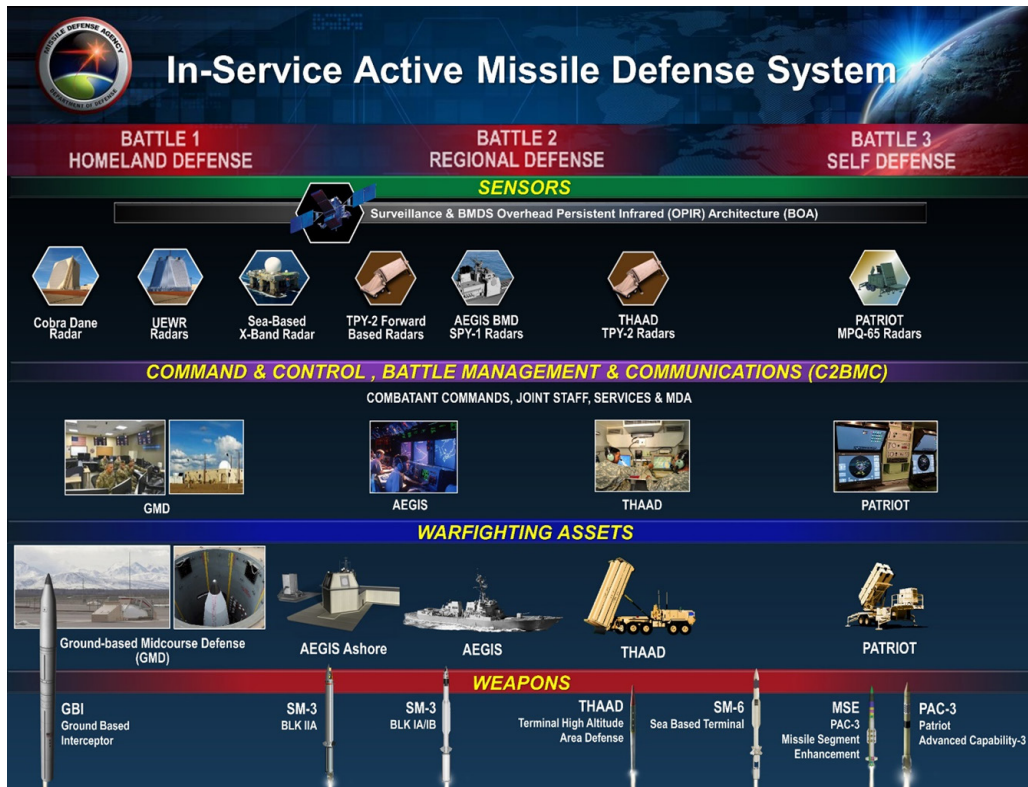
and capabilities, to include those that could support a space sensor network is essential for tracking and engaging advanced missile threats. North Korea is developing long-range ballistic missile systems that can reach the United States and its allies in the Indo-Pacific region. It has also tested shorter range missiles that maneuver within the atmosphere. Iran continues to develop more sophisticated missiles with improved accuracy, range, and lethality, and it is fielding an array of increasingly accurate short- and medium-range ballistic missile systems capable of threatening deployed U.S. forces, allies, and partners in the Middle East. It has combined ballistic or cruise missiles and unmanned aerial vehicles in complex attacks.



North Korean test fires an Hwasong-8 IRBM.

Major Program Element Highlights

The following discussion summarizes the highlights of major Program Elements (PE) in order of the Missile Defense System battle sequence: Detect, Control, and Engage.





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First, missile defense system sensors (radars and satellites) detect the launch of threat missiles and track them in flight, maintaining birth to death custody of the threats. Based on these tracks, C2BMC tasks the sensors to collect threat data with fire control accuracy to support the appropriate weapon systems in engagement of the threats. The weapon systems develop fire control solutions enabling their interceptors to engage and negate the threats. MDA's C2BMC is the all-domain backbone that enables missile defense system engagements.

Note: The following discussion does not necessarily examine all funding or activities included within each Program Element (PE).

I. Detect and Control

MDA delivers, maintains, and upgrades C2BMC capability across 19 time zones with hardened networks supporting U.S. Northern Command (USNORTHCOM), U.S. Indo-Pacific Command (USINDOPACOM), U.S. European Command (USEUCOM), U.S. Central Command (USCENTCOM), U.S. Space Command (USSPACECOM) and Missile Defense Radars for missile defense and space domain awareness mission support. The C2BMC System operates in a Joint, multi-domain environment connected to land, air, sea, space sensors and shooters, and provides continuous, real-time Missile Defense Command and Control, and Battle Management operations. The budget request includes:

- **C2BMC (PE 0603896C).** MDA is requesting \$554.2 million in FY 2024 for C2BMC. C2BMC provides the capability for persistent acquisition, tracking, cueing, discrimination, and distribution of fire-control quality data to the Aegis Weapon System, Ground Based Midcourse Defense (GMD), Terminal High Altitude Area Defense (THAAD), Patriot, Space C2 and coalition partners to support homeland and regional defense. MDA's C2BMC capabilities support Warfighter needs across the globe by providing the Combatant Commander with management and user nodes, the Ballistic Missile Defense (BMD) planner, situational awareness tools, and battle management capability. These tools support global missile defense situational awareness, coalition operations, weapons release authority for homeland defense, and control of and tasking to a variety of missile defense system radars. C2BMC operators and maintainers deploy to some of the world's most threatening regions and continue to provide around-the-clock support to local commanders.
- In FY 2024, MDA will sustain the fielded C2BMC capability (Spiral 8.2-3 initially and transition to Spiral 8.2-5) in USNORTHCOM, USINDOPACOM, USEUCOM, USCENTCOM, USSTRATCOM, and USSPACECOM Areas of Responsibilities, which includes the following capabilities: Mobile Sensor Phase 1 and BMDS Overhead Persistent Infrared Architecture (BOA) 6.1 track data to the missile defense system (BOA 6.1 initially and transition to BOA 7.0); support for Space Domain Awareness (SDA) with Hardened Army Navy/Transportable Radar Surveillance (AN/TPY-2) radars; Aegis Engage-on-Remote, which can provide a seven-fold increase in defended area coverage when compared to individual weapon system organic capability; and Protected Anti-Scintillation Anti-Jam Net-Centric support for continued communications between sites and CCMDs.

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- MDA continues to field Spiral 8.2-5, which integrates the Long Range Discrimination Radar (LRDR) and BOA 7.0 into the missile defense system for support of homeland defense. This spiral provides initial situational awareness and tracking capability for hypersonic threats based primarily on BOA 7.0 data; significantly expands Homeland Defense against North Korea and potentially Iranian ballistic missiles for USNORTHCOM and capabilities for USSPACECOM with LRDR; provides additional SDA coverage via the Aegis SPY-1 radar; integrates the U.S. Army's Integrated Air and Missile Defense (IAMD) Battle Command System into the missile defense system; integrates on-orbit Space-based Kill Assessment sensors providing initial hit assessment capability for homeland defense; and develops initial missile defense system track for homeland defense.
- MDA continues to improve the missile defense system capability to address advancing threats worldwide by investing in the development, integration, and testing of advanced algorithms to improve track and discrimination capabilities and enhance the use of space-based sensor data, through BOA.
- MDA will continue to update the missile defense system architecture to increase the cybersecurity posture by assessing the risk of C2BMC architecture against possible attack. C2BMC capabilities will be involved in multi-agency cyber-focused tests and assessments planned in FY 2024 to identify and correct cyber vulnerabilities.
- Finally, as part of the C2BMC budget request, MDA is requesting \$38.5 million in FY 2024 for the Defense of Guam. Funding provides improved BMDS communication network fiber and satellite communication paths to Guam for improved resilient mission communications and continues the development of improved overhead tracking and reporting of advanced threats.

- **Sea-Based X-band (SBX) Radar (PE 0603907C).** MDA is requesting \$177.9 million in FY 2024 for the SBX. SBX is an advanced sea-mobile radar that provides precision midcourse tracking and discrimination capabilities. The SBX participates in flight tests to demonstrate discrimination and debris mitigation improvements, as well as operations for homeland defense. The budget request includes funds to continue extended deployments to conduct operations for defense of the homeland. MDA plans an average of 335 days at sea for FY 2024.



Sea-Based X-band (SBX) in port Pearl Harbor, HI.

The budget request also continues fabrication of a replacement radome for the SBX. The new radome will be installed in FY 2025.

- **Long Range Discrimination Radar (LRDR) (PE 0604873C).** MDA is requesting \$103.5 million in FY 2024 for the LRDR, which will provide persistent long-range midcourse discrimination, precision tracking and hit assessment to support the GMD capability

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against long-range missile threats from the Pacific theater. LRDR's improved discrimination capability in the missile defense system architecture increases the defensive capacity of the homeland defense interceptor inventory by enabling conservation of Ground Based Interceptor. LRDR includes threat discrimination improvements to enhance missile defense system effectiveness against the evolving threat. LRDR also supports other mission areas, including Space Domain Awareness and Space Object Identification. Initial fielding of the LRDR was completed in FY 2022. Further, addition of the LRDR to the Operational Capability Baseline is planned for FY 2024 leading to the completion of the transition and transfer process of LRDR to the U.S. Space Force in the FY 2024 timeframe. MDA's request includes funding for software Independent Verification and Validation, Modeling and Simulation (M&S) efforts, and development of software for tracking and discrimination improvements and refined space intelligence data.



*Long Range Discrimination Radar (LRDR)
Northwest view in AK.*

- **Radar Program Maintenance and Sustainment** supports both homeland and regional defense missions. MDA is requesting \$227.8 million in FY 2024 to sustain AN/TPY-2 radars, provide related support to the U.S. Space Force's Cobra Dane, and Upgraded Early Warning Radars (UEWRs). The Services and CCMDs, with logistical support from MDA, operate AN/TPY-2 (Forward Based Mode) radars in Japan (two radars), Israel, Turkey, and USCENTCOM. MDA continues to support the AN/TPY-2 radar (Terminal Mode) as part of seven THAAD batteries both home-based and in the USINDOPACOM area of responsibility.
- **Radar Procurement.** MDA is requesting \$29.1 million to procure initial Digital Receiver/Exciter kits to upgrade from the current analog Receiver/Exciter technology to a modern digital capability, increasing reliability and AN/TPY-2 secure servers. Additionally, MDA will procure spares availability for the AN/TPY-2 radar fleet.
- **Sensors (PE 0603884C).** MDA is requesting \$231.1 million in FY 2023 to provide software updates for the AN/TPY-2, COBRA DANE, SBX, and UEWR radars to counter evolving threats, develop M&S, and to develop future radar capabilities through system engineering, software development, and testing. MDA is investing in a robust sensor architecture that supports MDS weapons systems by providing highly accurate midcourse tracking, discrimination and battle damage assessment for homeland missile defense. The request includes funding for the development of advanced discrimination algorithms for the AN/TPY-2 and SBX radars to counter advancing threats. These improvements support integrated capabilities to improve the MDS ability to identify lethal and non-lethal objects.

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- **Sensors Test (PE 0604879C).** MDA is requesting \$88.3 million in FY2023 for Sensors testing. This includes planning, analysis and execution of MDS flight test events, including pre- and post-test efforts such as Digital and Hardware-in-the-Loop (HWIL) System Pre-Mission Tests and System Post-Flight Reconstruction. Sensor tests also provide planning, analysis and execution in accordance with the ground test Concept of Operations for MDS-level ground tests identified in the Integrated Master Test Plan (IMTP), as well as support to HWIL infrastructure.
- **Space Program (PE 1206895C).** MDA is requesting \$109.5 million in FY 2024 for Missile Defense Space Programs. This request funds the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) development. HBTSS was initiated in 2018 to address the requirement to detect and track hypersonic threats and ballistic missiles. Following launch in late FY23, HBTSS on-orbit demonstration and testing will occur in FY24 to characterize and validate the HBTSS performance. HBTSS will then transition to execute daily satellite operations, participate in MDA and Other Government Agency flight testing, and develop and implement ground system and space vehicle software updates. MDA is collaborating with the U.S. Space Force to deploy HBTSS as an element within the larger Overhead Persistent Infrared Enterprise Architecture. This request also funds the Spacebased Kill Assessment (SKA) project, which uses a network of fast-rate infrared sensors hosted on commercial satellites to deliver a hit and kill assessment capability for homeland defense. SKA sensors on orbit today have participated successfully in a variety of MDA flight tests and engineering activities. FY 2024 will continue SKA on-orbit operations by experimenting and participating in missile defense system ground and flight tests and providing situational awareness hit assessment to USNORTHCOM during declared periods of heightened activity. Space Applications for Missile Defense will continue efforts previously funded through the Space Tracking and Surveillance System program to provide strategic planning, program integration, contracting, acquisition, engineering, financial management, internal reviews and audits, and program assessments for development and acquisition of missile defense space applications.

II. Engage

MDA remains committed to developing, delivering, sustaining, and improving the nation's missile defenses. The FY 2024 budget request continues to resource and improve U.S. homeland missile defenses designed to counter ballistic missile threats from North Korea and potentially Iran. In addition, the FY 2024 budget request continues to fund and build integrated missile defenses that are interoperable with systems deployed by international partners to protect our deployed forces, allies and international partners against regional ballistic, cruise, and hypersonic missile threats.

The **GMD system** currently defends the U.S. against long-range ballistic missile threats from North Korea and potentially Iran. Initially fielded in the early 2000s, the GMD system is undergoing a service life extension and will be improved with the addition of the Next Generation Interceptor starting no later than 2028. The budget request includes:

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- **GMD (PE 0603882C).** MDA is requesting \$903.6 million in FY 2024 for GMD. The GMD element of the missile defense system provides USNORTHCOM with a continuously available (24 hours a day, 7 days a week, 365 days a year) capability to defend the homeland against limited ICBM attacks during the midcourse phase of flight. The GMD capability consists of the Ground Based Interceptor, GMD Fire Control system (GFC), GMD Communication Network (GCN), In-Flight Interceptor Communications System Data Terminals (IDTs) and ground Launch Support Systems (LSS). MDA continues to upgrade and replace ground system infrastructure and fire control/kill vehicle software to improve the reliability, capability, and cybersecurity resiliency of the GMD weapon system. MDA will complete developing, testing and fielding the Ground System 8 software build that provides a selectable 2/3 stage employment capability for Ground Based Interceptors, improves discrimination, integrates LRDR with GFC, improves the system cyber-security posture, and supports GCN and IDT modernization.

In addition to Ground System 8 software, MDA will develop Ground Weapon Systems (GWS) 10A and 10B. GWS 10A will integrate into the weapon system the missile defense system track and the ability to plan and coordinate engagements with the Next Generation Interceptor. GWS 10B will include software re-architecture to support accelerated processing and expanded capacity and Phased Array (PA) IDTs to support increased two-way data transmissions with interceptors while in flight. GWS 10B will also provide cyber resiliency by creating a single common platform to improve cyber detection and response capabilities addressing the additional emerging threats, and provide discrimination improvements. MDA will complete the Service Life Extension Program on four Ground Based Interceptors integrated with new Configuration 2 boosters which will ensure a more reliable system is provided back to the USNORTHCOM Warfighter. MDA will continue integration of a new LSS into the Fort Greely, Alaska Missile Fields and GMD Ground Systems with modernized Silo Interface Vault equipment in the existing silos to increase silo capacity, compatibility and reliability. The budget request continues funding for PA IDT Software Development, PA IDT Antenna Development, and a Test PA IDT Asset. With the addition of the Next Generation Interceptor, the existing interceptor fleet service life will be extended beyond 2030. MDA will continue the Service Life Extension Program to support the existing Ground Based Interceptor fleet.



Initial lift of GBI from silo for MDA's Service Life Extension Program (SLEP).

- **Improved Homeland Defense Interceptors (PE 0604874C).** MDA is requesting \$2.1 billion in FY 2024 for the Next Generation Interceptor. On March 24, 2021, the Department of Defense awarded two contracts in support of the Next Generation

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Interceptor program. Retaining a competitive environment throughout the design and production development activities has already proven to be a key catalyst in support of the Department's ability to field a system capable of addressing the expanding threat no later than 2028 while receiving competitive production pricing. MDA has implemented lessons learned using the valuable technical information developed under previous technology and development programs including the Multi-Object Kill Vehicle and the Redesigned Kill Vehicle programs to positively influence the Next Generation Interceptor designs. The Next Generation Interceptor development will provide a more capable, robust, All-Up-Round solution to meet the emerging threat. The Next Generation Interceptor features a multiple kill vehicle payload, improves system survivability, and provides increased performance against projected threats from North Korea and potentially Iran. The budget request will continue to fund design, development, prototyping, integration and relevant environmental testing to mature the booster, payload, sensor(s), and design-specific critical technologies and technology elements to reduce technical risk.



GBI launched at Vandenberg Space Force Base, CA as part of Booster Vehicle Test.

- **Ground-Based Midcourse Defense Test (PE 0604887C).** MDA is requesting \$41.8 million in FY 2024 for the GMD test program, which supports the IMTP. Flight test mission FTG-12 will demonstrate Missile Defense System Increment 6B Homeland Defense functionality upgrades with a GMD intercept flight test in the expanded battlespace using the 2-/3-Stage Selectable capability in a Ground Based Interceptor to engage a threat representative Intermediate-Range Ballistic Missile (IRBM). Although no flight tests will be executed for the Next Generation Interceptor until the 2027 timeframe, continued ground testing and cyber testing are essential to support this critical missile defense system capability.
- **GMD Maintenance and Sustainment.** MDA is requesting \$174.8 million in FY 2024 for the Operation and Maintenance (O&M) of the GMD weapon system. In addition to operation, maintenance and sustainment of the GMD weapon system and operational and support facilities at Fort Greely, Alaska; Vandenberg Space Force Base (SFB), California; Fort Drum, New York; Schriever SFB, Colorado; and Eareckson Air Station, Alaska, this request includes Warfighter training, wargames, and exercises to maintain readiness. Finally, this request includes funding to repair and maintain the administrative, storage and supply facilities at Fort Greely, Alaska and Vandenberg SFB, California. These buildings were constructed in the mid-1950s with a planned useful life of 50 years and require significant repairs to avoid an adverse impact on the homeland defense mission.

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Aegis Weapon System and Standard Missile. Aegis missile defense program capitalizes on and evolves the existing U.S. Navy Aegis Weapon System and Standard Missile variants. Aegis provides a forward-deployable, mobile capability to detect and track ballistic missiles of all ranges, and has the ability to destroy short-range ballistic missiles (SRBMs) and medium-range ballistic missiles (MRBMs) in both the midcourse and terminal phases of flight and intermediate-range ballistic missiles in the midcourse phase of flight.



Aegis Ashore Deckhouse Facility, Poland.

The FY 2024 budget request supports continued advancement of the Aegis Weapon System to counter growing and more complex threats, including improvements in system and missile reliability as well as increases in Aegis engagement capacity and lethality. MDA continues to support the U.S. voluntary national contribution to the North Atlantic Treaty Organization (NATO) ballistic missile defense. Aegis Ashore in Romania is operational, and we plan to complete construction on Aegis Ashore Poland in 2023. Both sites are designed to launch the SM-3 Block IB and Block IIA missiles.

- **Aegis (PE 0603892C).** MDA requests \$693.7 million in FY 2024 for Aegis Missile Defense. MDA continues to provide additional software capability development to upgrade IAMD performance in Baseline 9.2 (BMD 5.1) and Baseline 10 (BMD 6.0). BMD 5.1 will continue radar sensitivity improvements with AEGIS Combat System Digital Receive Upgrade technology maturation and prototyping that will further improve AN/SPY-1 sensitivity, tracking performance, and resource utilization, which increases capability and performance against longer range and more sophisticated threats. MDA also continues software development for the IAMD Baseline 10 (BMD 6.0). BMD 6.0 will continue development and integration of missile defense capability with the Air and Missile Defense Radar, also known as the AN/SPY-6, for enhanced engagement capability and increased raid capacity. Additionally, MDA continues upgrading the SM-3 Block IB hardware and software to leverage the capability of the SM-3 Block IIA. As part of the overall Aegis budget request, MDA is requesting \$80.4 million in FY 2024 for the Defense of Guam. This funds the development of the Aegis Guam System Software configuration for land based Defense of Guam capabilities integrated with dispersed AN/TPY-6 Radar and multiple launchers.
- **Land Based SM-3 (0604880C).** MDA is requesting \$22.2 million in FY 2024 to modernize, develop, and test Aegis Ashore capability improvements at the Aegis Ashore Missile Defense Test Complex in Hawaii for implementation at operational sites. The funding also supports operations at the site in Romania and transition activities for the Poland site. In FY 2024 MDA will continue High-Altitude Electromagnetic Pulse Combat System hardening in Romania. Land Based SM-3 provides an Aegis Ashore exo-atmospheric defense against short to intermediate-range ballistic missile threats in the later stages of flight.

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- Aegis Testing (PE 0604878C).** MDA is requesting \$193.5 million in FY 2024 for the Aegis test program, which supports the IMTP. The Aegis Flight Test Program supports comprehensive testing of Aegis components and demonstrates their interoperability with the missile defense system. Using accredited M&S, the ground test program provides the objective evidence required to transition the capability to the Operational Capability Baseline. As part of the overall Aegis Test budget request, MDA is requesting \$42.1 million in FY 2024 for the Defense of Guam.



USS PAUL IGNATIUS (DDG-117) Fires an SM-3 IBTU during flight test.

- Aegis Procurement.** MDA requests a total of \$837.8 million in FY 2024 for Aegis procurement. This includes \$807.6 million for procuring Aegis SM-3 missiles. MDA will procure 27 Aegis SM-3 Block IB missiles and 12 Aegis SM-3 Block IIA missiles in FY 2024. The procurement budget also requests \$27.8 million for Aegis Weapon Systems consisting of Aegis shipset equipment, software, and installation materials. The budget requests \$2.4 million for completing combat system installation and combat structure adaptation at the Aegis Ashore site in Poland. Appropriately configured Aegis ships and the Aegis Ashore sites in Romania and Poland can launch both missile variants.
- Aegis Maintenance and Sustainment.** MDA is requesting \$72.2 million in FY 2024 in O&M funding. The Aegis program will perform missile recertification, repair efforts, and Ordnance Assessment/Surveillance. This funding also supports sustainment of BMD Computer Programs, Ship Equipment, and Aegis Ashore, as well as Fleet integration support.

- Defense of Guam (PE 0604102C).** MDA requests \$397.6 million in FY 2024 to continue the development of an integrated missile defense system for Guam defense against a range of missile threats. This Program supports the Pacific Deterrence Initiative. The final Defense of Guam architecture design includes integration efforts between MDA, U.S. Army, and U.S. Navy systems. The budget request includes critical requirements to support the architecture. These efforts include the development of the AN/TPY-6 radar to provide persistent long-range midcourse discrimination, precision tracking and hit assessment to support the Defense of Guam capability against long-range missile threats



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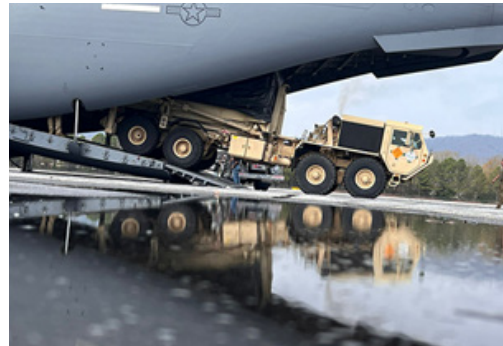


in the Pacific theater. AN/TPY-6 provides a 360 degree integrated sensor coverage, enables remote operations, and supports In-Flight Interceptor via the Aegis Guam System. The request also includes the Aegis Guam System development to interface with the dispersed the AN/TPY-6 radar, dispersed MK41 Vertical Launcher System (VLS) and the integration and control for a new U.S. Army missile launcher. The program continues Aegis Guam System architecture development and systems engineering activities necessary to provide an integrated air and missile defense system on Guam against ballistic and air-breathing missile threats.

- **Defense of Guam Procurement.** MDA requests \$169.6 million in FY 2024 to provide Aegis Guam System and vertical launch equipment in order to support the final delivery schedule. Note: MDA is requesting a total of \$801.7 million for the Defense of Guam in FY 2024 (excludes program-wide support funding), to include \$632.1 million in RDT&E (multiple PE's), and \$169.6 million in Procurement.

THAAD weapon system. THAAD is a globally-transportable, ground-based missile defense system that is highly effective against short-, medium-, and limited intermediate-range ballistic missile threats inside and outside the atmosphere in the terminal phase of flight. THAAD provides unique, cost-effective, and rapidly deployable capability to the CCMDs. MDA currently supports forward-deployment of two batteries stationed in the USINDOPACOM area of responsibility. Specific to THAAD, MDA's request includes:

- **Terminal Defense (PE 0603881C).** MDA is requesting \$220.3 million for THAAD development efforts in FY 2024. MDA will continue the development and integration of multiple, independent THAAD system upgrades to improve reliability, availability, readiness, and defense planning, in order to improve the capability to engage SRBM, MRBM, and limited IRBM threats. These development efforts will enhance THAAD's capability against global operational threats.



THAAD Launcher loaded onto a C-17 aircraft at Anniston Regional Airport.

- **Terminal Defense Testing (PE 0604876C).** MDA requests \$47.6 million for Terminal Defense Testing in FY 2024, consistent with the IMTP. This includes flight and ground testing, test operations and infrastructure, wargames, and exercises.
- **THAAD Procurement.** MDA is requesting \$216.8 million for THAAD procurement in FY 2024 for 11 THAAD Interceptors, Interceptor obsolescence mitigation efforts, the Stockpile Reliability Program, and THAAD Battery Ground Component obsolescence modifications. Procurement of 11 THAAD Interceptors in FY 2024 supports the minimum quantity required to maintain continuous production at the Prime and supplier level.

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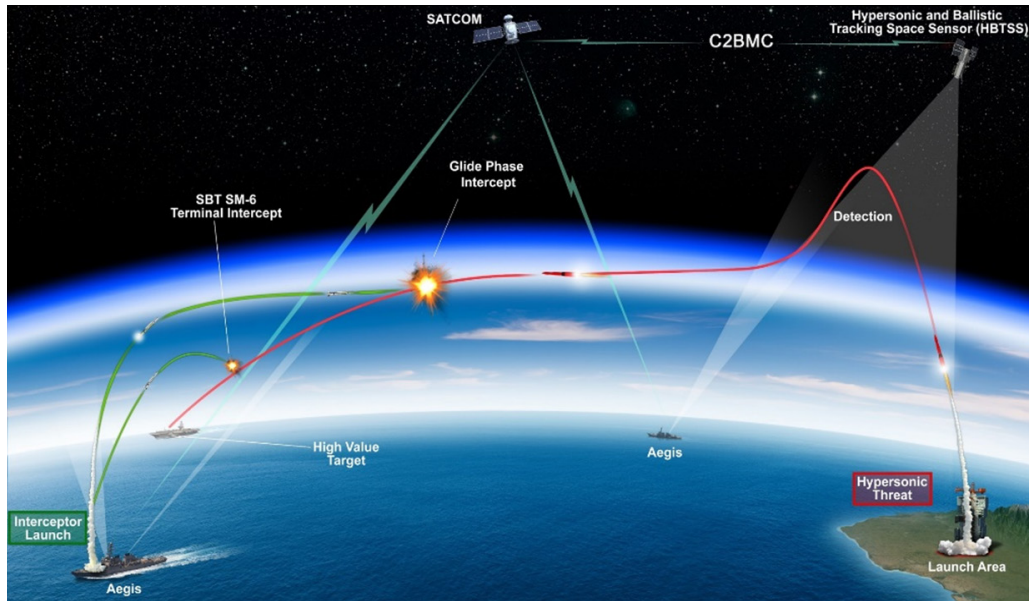
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- **THAAD Operations and Maintenance.** MDA is requesting \$89.3 million for O&M in FY 2024 to support the maintenance and upkeep of all missile defense system-unique items of the fielded U.S. THAAD batteries and for all THAAD training devices. In FY 2024, MDA will provide support to seven THAAD batteries, including the two forward-based batteries stationed in the USINDOPACOM area of responsibility, and is prepared to support the U.S. Army in any future deployments around the world.

III. Technology

With a mission focused on warfighting outcomes, MDA is investing in innovative and disruptive technologies to provide leap-ahead capabilities to address the emergence of new and more advanced threats. This budget request will continue development of technology improvements for the current missile defense system, along with breakthrough technologies for integration into future missile defense architectures. These efforts include:



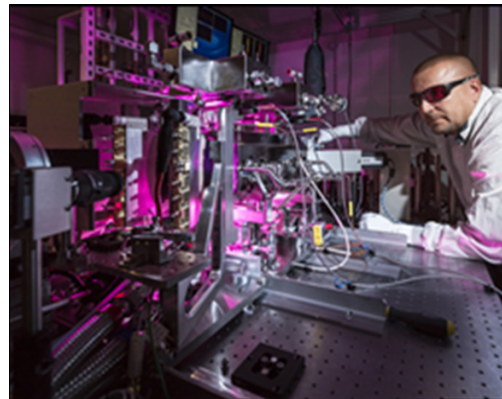
- **Hypersonic Defense (PE 0604181C).** MDA requests \$209.0 million for FY 2024 for Hypersonic Defense to competitively develop and deliver a glide phase intercept defensive capability with Industry. The glide phase intercept capability will provide a new layered defense architecture to counter hypersonic threats and will increase the effectiveness of existing terminal defense systems. This effort will develop a new interceptor as well as modify the existing Aegis Weapon System to defeat hypersonic threats in the glide phase. The program will focus on early risk reduction of critical technology threats.

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- **Advanced Research Program (PE 0603180C).** MDA is requesting \$21.5 million in FY 2024, to conduct innovative, state of the art, research and development with small and large businesses, universities, national laboratories, and allied nations to create and enable future missile defense capabilities aligned to the MDA Science and Technology Strategy. Key investments include development, characterization, and risk mitigation testing of advanced materials, seeker windows, power controls and propulsion systems, and maturation of kill vehicle and satellite communication and processing technology for engagement management of the missile defense system. The program assesses and demonstrates the utility of emerging component technologies, then facilitates transition of the technologies into the missile defense system to address identified Agency gaps and Warfighter needs. The program also manages the selection process and administers the Missile Defense Small Business Innovation Research program
- **Advanced Concepts & Performance Assessment (PE 0603176C).** MDA is requesting \$17.8 million in FY 2024 to centralize advanced technology concept modeling, simulation, and performance analysis. Advanced Concepts & Performance Assessments focus on the exploration of novel and emerging capabilities that may have the potential to enhance missile defense. The request will fund independent government assessments of industry sensor, directed energy, and weapon system technology concepts and mature related tracking, discrimination, and sensor fusion algorithms. Assessment activities include development of Hypersonic Defense, Artificial Intelligence and Machine Learning Initiatives, and Left-through-Right Integration key technology areas. The innovative structured concept definition and assessment methodology enables MDA to validate focus areas, verify contractor technology solutions, and evaluate promising concepts for use in future missile defense architectures. This program element supports the monitoring and tracking of cybersecurity mitigations, as well as the exploration of cyber effects on emerging technology.



Testing of Diode Pumped Alkali Laser (DPAL).

IV. Missile Defense Testing

MDA plans and executes a fully integrated test program that synchronizes the system under test with the Warfighters trained to operate the system under varying wartime conditions against current and emerging threats. The Integrated Master Test Plan (IMTP) documents our rigorous test program (flight, ground, cyber, wargames, and exercises). MDA structures its test program to improve confidence in the missile defense capabilities under development and to ensure the capabilities transferred to the Warfighter are operationally effective, suitable, and survivable.

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- Missile Defense System Testing (PE 0603914C).** MDA is requesting \$360.5 million in FY 2024. MDA conducts regular intercept flight tests. These tests provide data to anchor models and simulations that can then be used to verify performance and confirm the technological progress of the Missile defense system against missile threats. MDA also conducts regular, rigorous non-intercept tests, including sensor characterization flight tests, ground tests, cybersecurity and resiliency tests, wargames, and exercises. Developed in collaboration with stakeholders, the IMTP identifies and incorporates all testing requirements into a comprehensive, highly integrated, cost-effective series of flight tests, ground tests, cybersecurity tests, exercises, and wargames. IMTP Stakeholders, who are also signatories, include: Director, Operational Test & Evaluation; Director, Developmental Test, Evaluation and Assessments; Commander, Joint Functional Component Command for Integrated Missile Defense representing CCMDs; Commander, Army Test and Evaluation Command; Commander, Air Force Operational Test and Evaluation Center; Commander, Operational Test and Evaluation Force; and Commander, Joint Interoperability Test Command. For flight testing, the Agency incorporates nine operational realism criteria. For system-level ground testing, all tests culminate in operational testing with Warfighters on console and independent operational assessments by the missile defense system Operational Test Agency Team. This ensures that missile defense system capabilities are credibly demonstrated and validated prior to delivery to the Warfighter. The IMTP supports MDA's programming strategy and test priorities. This test program captures:

- Sea-Based Terminal Increment 3 simulated Aegis BL9.2.4/SM-6 engagement against a hypersonic glide vehicle.
- Sea-Based Weapon System Midcourse performing a target scene data collect of a medium range ballistic missile (MRBM) with countermeasures.
- 3-Event Flight Test Campaign for THAAD to assess TH 4.0 Global software capability to detect, track, and discriminate SRBMs with countermeasures (CMs). Each event will feature a target with different CMs; no interceptors will be launched. Also, the event will demonstrate interoperability with Patriot by exchanging Link-16 messages (supports Increment 6C/7).
- Annual interoperability and integration flight testing with Patriot.
- Increased flight test integration and interoperability testing with Allies, including support for Pacific Dragon Live-Fire Exercise
- Refinements on test planning for system-level ground testing.
- Updates on planning for cybersecurity testing.
- As part of the overall MDA Test budget request, MDA is requesting \$15.0 million in FY 2024 for the Defense of Guam. Funding will provide for the initial flight and ground testing of the Defense of Guam architecture to achieve developmental and operational test objectives to deliver data for capability assessments and fielding. Funding directly supports the first flight test for the Aegis Guam Weapon System tracking of a Medium Range Ballistic Missile target.



BUDGET ESTIMATES OVERVIEW

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- **Missile Defense System Targets (PE 0603915C).** MDA is requesting \$570.3 million in FY 2024 to develop, produce, and launch an economical and reliable inventory of targets based on engineering assessments of threat intelligence data. This funding enables the test, verification, and validation of the performance of the missile defense system against threats in support of the IMTP, and includes funding for the continued development of Advanced Targets, and development and production of more reliable and capable MRBM Target motors with enhanced maneuverability and range. As part of the overall MDA Targets budget request, MDA is requesting \$53.0 million in FY 2024 to provide targets required for testing related to the Defense of Guam. This funding will provide non-recurring engineering and hardware for the development of the Hypersonic Test Vehicle (HTV) flight test re-entry vehicle.
- **Ground Test Facility Infrastructure (GTFI).** MDA is requesting \$148.0 million of Military Construction (Major MILCON) to support the relocation of critical missile defense system assets from off-post lease space to the Von Braun Complex.

V. Israeli Programs

MDA is requesting \$500 million for Israeli programs in FY 2024. This funding level remains consistent with the Memorandum of Understanding between the United States and Israel that spans FY 2019 – FY 2028. This budget continues MDA's longstanding support of U.S.-Israeli Cooperative Programs, to include the co-development and co-production of the David's Sling Weapon System and the Arrow Weapon System. The Department continues to support co-production efforts for the Iron Dome Defensive System program to provide critical defense against short-range rockets and missiles, mortars, and artillery shells, as well as new capabilities against Unmanned Aerial Vehicles.



Israel Missile Defense Organization & MDA conduct test of Arrow Weapon System.

SUMMARY

MDA requests \$10.9 billion in FY 2024 for missile defense development efforts to continue building Warfighter confidence by focusing on readiness and sustainment, increasing capability and capacity of fielded homeland and regional defense systems, and increasing the speed of delivery of advanced technology to counter the advanced missile threat.

