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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603896C I Ballistic Missile Defense Command and Control, Battle Management & C ommunication
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	4,101.943	639.027	564.946	589.374	-	589.374	575.883	588.824	612.853	605.801	Continuing	Continuing
MD01: Command & Control, Battle Management, Communications (C2BMC)	2,610.267	405.836	339.716	368.950	-	368.950	351.786	355.998	372.510	364.903	Continuing	Continuing
MC01: Cyber Operations	62.855	17.132	12.537	8.504	-	8.504	8.255	8.504	8.664	8.839	Continuing	Continuing
MT01: C2BMC Test	417.802	60.345	65.341	58.616	-	58.616	56.453	64.671	66.276	63.637	Continuing	Continuing
MX01: Command & Control, Battle Management, Communications (C2BMC) Development Support	841.802	129.960	125.086	131.903	-	131.903	138.665	139.480	142.259	145.342	Continuing	Continuing
MD40: Program-Wide Support	169.217	25.754	22.266	21.401	-	21.401	20.724	20.171	23.144	23.080	Continuing	Continuing

Program MDAP/MAIS Code: 362

Note
 The increase from FY 2022 to FY 2023 provides additional product support and software development for Spiral 8.2-5 and provides for the initiation of the C2BMC portion of the Department of Defense architecture solution for Defense of Guam.

A. Mission Description and Budget Item Justification
 The Command and Control, Battle Management, and Communications (C2BMC) program is the integrating element of the Missile Defense System (MDS). It is a vital operational system that enables the U.S. President, Secretary of Defense and Combatant Commanders at strategic, regional and operational levels to systematically plan missile defense operations, to collectively see the battle develop, and to dynamically manage designated networked sensors and weapons systems to achieve global and regional mission objectives. Systems linked through C2BMC include Patriot, Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense (BMD), Aegis Ashore, Ground-based Midcourse Defense (GMD), Army Integrated Air and Missile Defense Battle Command System (IBCS), and sensors such as the Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) Radar, Sea-Based X-Band Radar (SBX), Long Range Discrimination Radar (LRDR), Homeland Defense, Space-Based Infrared System (SBIRS), and BMDS Overhead Persistent Infrared (OPIR) Architecture (BOA). The C2BMC program also works to increase coalition partners' capabilities and investigates concepts and explores system engineering issues associated with innovative space applications for a missile defense intercept and defeat system. C2BMC begins support to integrate existing sensor elements within Missile Defense Agency and the Services into the Ballistic Missile Defense System Communications Network (BCN) to establish a globally integrated sensor architecture to provide enhanced, dynamic space capabilities, and extend existing BCN network and cybersecurity management to cover the expanded architecture.

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	645.741	603.448	0.000	-	0.000
Current President's Budget	639.027	564.946	589.374	-	589.374
Total Adjustments	-6.714	-38.502	589.374	-	589.374
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-44.978			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	6.476			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-8.364	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	1.650	0.000	589.374	-	589.374

Change Summary Explanation

Decrease of \$44.9 million in FY 2022 reflects the Congressional reduction for Layered Homeland Defense (LHD) from lack of validated requirements and acquisition strategy. Increase of \$6.4 million in FY 2022 provides the Congressional plus-up for Joint All Domain Command and Control (JADC2) and MDS Cybersecurity.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
MD01: <i>Command & Control, Battle Management, Communications (C2BMC)</i>	2,610.267	405.836	339.716	368.950	-	368.950	351.786	355.998	372.510	364.903	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2022 to FY 2023 provides additional product support and software development for Spiral 8.2-5 and provides for the initiation of the C2BMC portion of the Department of Defense architecture solution for Defense of Guam.

A. Mission Description and Budget Item Justification

Provides incremental development, deployment, and operational support of C2BMC capabilities required for Missile Defense System (MDS) planning, situational awareness, sensor management, and engagement coordination. The FY 2019 National Defense Authorization Act (NDAA) section 869 recognized C2BMC for its implementation of this iterative practice and directed C2BMC's inclusion in a Community of Practice to advise on agile or iterative development.

C2BMC delivers capabilities incrementally with each software build (named as a Spiral), adding to or enhancing the capability of the previous build. C2BMC incremental delivery of Spiral 8.2 provides critical Homeland Defense for increased Ground-Based Missile Defense (GMD) battlespace, improved threat tracking using multiple sensors communicating via Link 16, enhanced sensor tasking to meet track quality and discrimination timeliness requirements, Space Domain Awareness (SDA) tasking support, and improved cyber capabilities. Enhanced Homeland Defense also integrates the Ballistic Missile Defense System (BMDS) Overhead Persistent Infrared (OPIR) Architecture (BOA) with the MDS to enhance system level missile-tracking capabilities through earlier cueing of radars and weapon systems.

European Phased Adaptive Approach (EPAA) Phase 3/Engage-on-Remote (EOR) (Spiral 8.2-3) provides critical sensor management capability, greater engagement flexibility, improved OPIR-based cueing, and enhanced Aegis Ballistic Missile Defense (BMD) defended area by enabling Aegis to use Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) data for EOR engagements, providing a five-fold increase in defended area coverage in the US Central Command (USCENTCOM) and US European Command (USEUCOM) area of responsibility compared to individual weapon system organic capability. Spiral 8.2-3 also includes SDA and integrates Mobile Sensor Integration (MSI) Phase 1 and BOA data into the MDS.

Long Range Discrimination Radar (LRDR) Control for Homeland Defense (Spiral 8.2-5) enables increased homeland and regional defense by providing LRDR sensor management, creation and dissemination of a BMD System track inclusive of LRDR sensor data, hypersonic threat tracking, significant capability expansion of track and reporting Advance Threats for warfighter SDA; implements Link-16 reporting, integration of system level discrimination data, transmission of LRDR-based information to GMD Fire Control (GFC) and other MDS elements; and operationalization of Space-based Kill Assessment (SKA) hit assessment for Homeland Defense.

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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Expanded Regional and Homeland Defense Increment 7 (Spiral 8.2-7) will provide BMDS System Track (BST) with System Level Discrimination Integration for GMD engagements; Expanded Active Sensor Bias Monitoring and Full Reporting; Refined Space and Intelligence Data; Expanded Hypersonic Tracking and Link-16 Reporting.

C2BMC continues to develop incremental improvements to the MDS to keep pace with emerging threats worldwide by investing in the development, integration, and testing of advanced algorithms to improve track and discrimination capabilities and enhancing use of space based sensor data from sources such as the Space Based Infrared System (SBIRS), using the BMDS OPIR architecture. Related disciplines provide development and deployment support to C2BMC system capabilities. In support of Hypersonic Defense, C2BMC will provide contingency capability to demonstrate, develop and deploy a detection and warning for advanced threats. C2BMC continues Protected Anti-Jam/Anti-Scintillation Wideband Net-Centric System (PAAWNS) modem integration, installations, and technical refresh globally of the threat based communication network modernization against the advanced threat, while maintaining efficiencies in cost.

C2BMC International Partner system engineering ensures allies and partners are integrated to the fullest extent possible with U.S. MDS capabilities. Collaborative system engineering, testing, and fielding facilitate interoperability with North Atlantic Treaty Organization (NATO) and partner nations such as Israel and Japan. C2BMC works with these nations to define and document international interfaces that are compatible with international standards and traceable to U.S. MDS requirements. C2BMC participates in test events and live fire exercises hosted by international partners to ensure U.S. missile defense weapons, sensors, and C2 systems are interoperable with international systems. C2BMC maintains and upgrades the U.S./NATO secure data sharing gateways located at Ramstein Air Base, Germany, for missile defense operations and training. C2BMC also supports development of Japan's BMD requirements to ensure interoperability of Japanese and U.S. BMD systems (sensors, shooters, C2) resulting in an integrated regional, operational, and strategic defense of Japan.

C2BMC Modeling and Simulation (M&S) maintains MDS simulation/stimulation tools and federated models to support development and verification of deployed C2BMC and BOA Spirals. The BMDS C2BMC Model (BCM) is used for Flight Test pre-mission analysis and exercises to represent a second C2 Suite for Cross-Area of Responsibility (XAOR) functionality, Early Digital Product (EDP) for C2BMC performance assessment, and supports development and integration of GMD, AN/TPY-2, and Aegis software and models. The OPIR sensor M&S is used in the Ground Test Integrated System-level Simulation (GTISS) as the stimulus for BOA. The BCM program provides a cost effective means to assess and explore the performance space of the MDS beyond what can be physically tested via Flight Tests and Target of Opportunity collections.

C2BMC develops, integrates, and tests advanced algorithms to improve discrimination capabilities and enhance the use of space-based sensor data. In support of Missile Defense Agency (MDA) discrimination improvements effort, C2BMC demonstrates, develops, and deploys multiple techniques to improve BMD System ability to identify lethal and non-lethal objects.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: C2BMC Development and Deployment	282.068	264.708	313.489
Articles:	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

Description: Provides funding for incremental development and deployment of C2BMC capabilities that link sensors and shooters to enable integrated MDS capabilities, integrate BOA with the MDS architecture to enhance missile tracking capabilities and enable much earlier cueing of radars and shooters, and fulfill Cybersecurity requirements. The Enterprise Sensors Laboratory (ESL) and Experimentation Laboratory (X-Lab) produce key prototypes for further maturation in the C2BMC capability Spiral development process and enable integrated experimentation for C2BMC, ESL, OPIR products, and other MDS elements through robust connectivity to simulation frameworks, weapon systems, sensors, and operational assets. Expand capability to track and report Advanced Threats for warfighter Situational Awareness. Expanding SDA tasking and reporting to include TPY2, LRDR, and Aegis sensors.

Recurring accomplishments include iterative development and procurement cycles for hardware, software, network capability system engineering tasks, and artifacts for technical engineering reviews; participation in test readiness reviews, pre-test engineering, and analysis of ground and flight test results, wargames, and exercises in accordance with the MDS Integrated Master Test Plan (IMTP); site planning, scheduling, and hardware acquisition to support planned deployment of C2BMC Spirals and BOA capabilities; updates and maintenance for C2BMC Model (BCM) MDS simulation/stimulation (federated model) and verification scenarios for all C2BMC Spirals deployed and under development; Discrimination, operationalization of SKA Hit Assessment, and C2BMC capabilities; design and installation of operational sharing gateways; and collaboration with international partners to ensure future interoperability; and maintain Verification and Validation in support of MDS capability ground testing and participation in MDS ground tests. C2BMC will continue to design and prototype the next incremental capability addressing Additional Homeland Defense and Mid-Term Discrimination requirements, inclusive of C2BMC Generation of BMD System Track (with System Level Discrimination Data Integration) for GMD Homeland Defense Engagements and Expanded Regional and Homeland Defense, and an expanded interface with the OPIR enterprise, which yields additional raid handling capacity, enhanced Aegis BMD engage on capability, and expanded hypersonic defense tracking and reporting.

C2BMC will begin to integrate existing MDA and Service elements with C2BMC and the Ballistic Missile Defense System Communications Network (BCN) to establish a globally integrated sensor architecture to provide enhanced, dynamic space capabilities, and extend existing BCN network and cybersecurity management to cover the expanded architecture. The expanded sensor architecture will integrate ground-based radars from the U.S. Space Force Space Surveillance Network (SSN), orchestrated by C2BMC, and develop algorithms to fuse and/or correlate the data provided by these sensors in support of missile defense and space C2 missions.

Specific and/or unique accomplishments for each FY are as follows:

FY 2021	FY 2022	FY 2023

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
<p><i>FY 2022 Plans:</i></p> <p>LRDR for Homeland Defense (Spiral 8.2-5), homeland defense focus:</p> <ul style="list-style-type: none"> - Complete incremental capability development for S8.2-5 in response to emergent operational requirements - Complete phased deployment of hardware and software to provide LRDR MDS network connectivity and sensor control nodes - Complete development, integration, and operationalization of BOA 7.0 capability to detect and track advanced threats globally - Complete development and testing of Space-based Kill Assessment (SKA) Hit Assessment (HA) - Begin sustainment of S8.2-5 capabilities <p>C2BMC Additional and Expanded Regional and Homeland Defense focus:</p> <ul style="list-style-type: none"> - Continue design and development of, and deliver accredited models and simulations (M&S) for, C2BMC and BOA spirals for participation in End-to-end Digital Integrated System Simulation (EDISS) - Support two training device development and fielding programs for distributed and individual training - Continue to support the design and development of Ground Test Integrated System-level Simulation (GTISS) by developing and delivering accredited M&S for BOA spirals - Continue development of next iteration of BOA which will include addition of new sensors and expanded Advanced Threat Performance - Continue development to integrate additional advanced sensors into BOA to expand coverage and increase custody of emerging threats - Initiate integration of sensor elements to provide enhanced, dynamic space capabilities and extend existing Ballistic Missile Defense System Communications Network (BCN) and cybersecurity management to cover expanded architecture - Continue technical upgrade and refresh for development lab infrastructure and the Joint Early Warning Lab (JEWL) <p>Space C2 Integration</p> <ul style="list-style-type: none"> - Initiate development and test of source and system track algorithms in support of Space C2 sensor orchestration - Continue development, integration, and test of the Eglin C-Band Radar, Millstone, ALTAIR, Space Fence, and GBR-K sensors into C2BMC - Initiate development of Space Domain Awareness sensor integration of a Upgraded Early Warning Radar (UEWR) sensor in support of Joint Space C2/MD missions - Support interface development and test for the Millstone, ALTAIR, Space Fence, Eglin C-Band, and UEWR radars as their U.S. Space Force upgrade paths near IOC - Initiate early operational testing of the above SSN sensors with C2BMC serving as the sensor orchestrator and track processor - Conduct studies to evaluate and optimize trades in support of delivering integrated Space C2 and missile defense capabilities 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
<p>JADC2 Interface:</p> <ul style="list-style-type: none"> - Congressional plus up for JADC2 Interface will connect C2BMC X-Lab and ESL to the JADC2 Battle Lab Network using the Joint Demonstration Environment <p>FY 2023 Plans:</p> <p>LRDR for Homeland Defense (Spiral 8.2-5), homeland defense focus:</p> <ul style="list-style-type: none"> - Continue sustainment of S8.2-5 capabilities <p>C2BMC Additional and Expanded Regional and Homeland Defense focus:</p> <ul style="list-style-type: none"> - Continue development of next iteration of BOA which will include addition of new sensors and expanded Advanced Threat Performance - Continue development to integrate additional advanced sensors into BOA to expand coverage and increase custody of emerging threats <p>Space C2 Integration</p> <ul style="list-style-type: none"> - Continue development and test of source and system track algorithms in support of Space C2 sensor orchestration - Continue development, integration, and test of the Eglin C-Band Radar, Millstone, ALTAIR, Space Fence, and GBR-K sensors into C2BMC - Continue development of Space Domain Awareness sensor integration of a UEWR sensor in support of Joint Space C2/MD missions - Support interface development and test for the Millstone, ALTAIR, Space Fence, Eglin C-Band, and UEWR radars as their U.S. Space Force upgrade paths near IOC - Continue early operational testing of the above SSN sensors with C2BMC serving as the sensor orchestrator and track processor - Conduct studies to evaluate and optimize trades in support of delivering integrated Space C2 and missile defense capabilities <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY 2022 to FY 2023 provides additional product support and software development for Spiral 8.2-5.</p>			
<p>Title: C2BMC Communications</p> <p align="right">Articles:</p>	37.568 -	35.265 -	35.461 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
<p>Description: The BCN ties together an expanding set of sensors and weapons systems to enable the National Command Authority and the commanders at the strategic, theater, and tactical levels to optimally engage missile threats. Recurring accomplishments include the following:</p> <ul style="list-style-type: none"> - Provide GMD Communications Network (GCN) Long Haul Communications Transport (LHCT) services and a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure with diverse paths that quickly and unambiguously share information across the global MDS - Participate in and analyze results from events scheduled in the MDS IMTP - Provide MDS communications via leased Defense Information Service Agency (DISA) circuits, and resolve real-time operational issues through DISA's Network Operations and Security Center - Provide effective network management to coordinate and integrate information across diverse equipment platforms, interface with other DoD communications systems, evolve information standards and capabilities, and adhere to the DoD Risk Management Framework (RMF) - Upgrade BCN capability by supporting all DoD teleports to enhance satellite communications - Continue technical refresh for End-of-Life SATCOM terminals on SBX by transitioning to Military Satellite Communications (MILSATCOM) terminals - Continue acquiring additional network circuits to support the threat based communication network modernization - Continue PAAWNS modem testing integration and installations globally <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Continue upgrade and technical refresh of the PAAWNS threat based communication network against the advanced threat of nuclear capabilities, while maintaining efficiencies in cost - Continue upgrade and integration of AN-TPY/2 High-Altitude Electromagnetic Pulse Hardened Transport Terminals (HEMPHTTs) for increased protection of satellite communication systems at relevant sites <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue upgrade and technical refresh of the PAAWNS threat based communication network against the advanced threat of nuclear capabilities, while maintaining efficiencies in cost - Continue upgrade and integration of AN-TPY/2 HEMPHTTs for increased protection of satellite communication systems at relevant sites 			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
- Provide SBX terminal and cyber upgrades			
FY 2022 to FY 2023 Increase/Decrease Statement: N/A			
Title: Classified	50.000	39.743	0.000
Articles:	-	-	-
Description: Provides for the development of innovative command and control techniques and technology to accelerate integration of non-traditional sensors for missile defense. Leverage advanced processing nodes, innovative fusion techniques, and advanced capabilities for enhanced tracking and reporting.			
Specific and/or unique accomplishments for each FY are as follows:			
FY 2022 Plans: - SEE ABOVE			
FY 2023 Plans: N/A			
FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from FY 2022 to FY 2023 reflects the completion of classified efforts for the development of innovative command and control techniques and technology to accelerate integration of non-traditional sensors.			
Title: Cruise Missile Defense for Homeland	36.200	0.000	0.000
Articles:	-	-	-
Description: Accelerates capability against cruise missiles and asymmetric threats. Provides performance assessment of advanced cruise missiles, leverages Command and Control, Battle Management, and Communications Enterprise Sensor Processing. Node to track and report on advanced threats, and establishes a new suite for 24 hours a day, 7 days a week, 365 days a year testing of new ground processing algorithms to detect and report on long range cruise missiles, and will demonstrate a design with non-traditional sensors and networks, with the potential for limited leave behind capability.			
Specific and/or unique accomplishments for each FY are as follows:			
FY 2022 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
N/A			
FY 2023 Plans: N/A			
FY 2022 to FY 2023 Increase/Decrease Statement: N/A			
Title: Guam Defense Design/Upgrade C2BMC Battle Management Decision Aids, Planners and Algorithms	0.000	0.000	20.000
Articles:	-	-	-
Description: Deploy C2BMC User Node to support Guam defense to provide ballistic and hypersonic threat typing and tracking, battle management decision aids and regional radar support while integrating with IBCS and Aegis Weapon System. BOA updates to support regional raid tracking. Enterprise Sensor Processing Node (ESPN) to provide cruise missile typing, warning, and tracking.			
FY 2022 Plans: N/A			
FY 2023 Plans: -Initiate ESPN Cruise Missile development at Enterprise Sensor Laboratory (ESL) -Initiate Site Surveys, procure and install Type 1 Defense Information System Agency Nodes -Initiate Command Center Planning and Design			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY 2022 to FY 2023 provides for the initiation of the C2BMC portion of the Department of Defense architecture solution for Defense of Guam.			
Accomplishments/Planned Programs Subtotals	405.836	339.716	368.950

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603881C: <i>Ballistic Missile</i>	305.081	213.382	190.216	-	190.216	196.279	213.945	224.146	238.269	Continuing	Continuing
<i>Defense Terminal Defense Segment</i>											

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,195.853	724.028	667.524	-	667.524	870.817	802.617	781.973	765.733	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	259.605	254.962	231.134	-	231.134	250.028	274.705	276.254	257.575	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	607.167	623.644	591.847	-	591.847	613.589	625.761	635.633	640.374	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	861.809	639.549	600.072	-	600.072	658.798	574.014	570.018	580.496	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	54.026	52.403	49.367	-	49.367	51.744	56.502	57.833	59.006	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	120.063	147.241	164.668	-	164.668	174.934	215.367	198.956	179.622	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	364.994	389.156	367.824	-	367.824	363.963	421.261	476.991	490.176	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	534.348	560.478	559.513	-	559.513	555.341	623.995	628.146	632.072	Continuing	Continuing
• 0604181C: <i>Hypersonic Defense</i>	267.589	287.796	225.477	-	225.477	108.540	110.220	287.535	449.590	Continuing	Continuing
• 0604672C: <i>Homeland Defense Radar-Hawaii</i>	133.000	75.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	208.000
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	135.088	133.335	75.120	-	75.120	103.451	95.712	71.715	76.316	Continuing	Continuing

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the DISA supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source Specialized

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BOA.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency											Date: April 2022				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - Independent Performance Assessment and Analysis -Various	MIPR	Various : Huntsville, AL, Colorado Springs, CO; NCR	8.965	5.625	Oct 2020	1.886	Oct 2021	4.455	Oct 2022	-		4.455	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Aggregated Discrim	Various	Various : AL; CO; FL; OH; MA; VA	53.851	17.088	Oct 2020	12.443	Oct 2021	6.598	Nov 2022	-		6.598	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BMDS C2BMC Model (BCM) - EDISS Integration	SS/CPPIF	Lockheed Martin : Huntsville, AL, Colorado Springs, CO; NCR	9.186	3.527	Oct 2020	3.797	Oct 2021	0.933	Oct 2022	-		0.933	0.000	17.443	0.000
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/GTISS	C/CPAF	SciTec : Newark, NJ	0.583	0.000		2.575	Oct 2021	1.676	Nov 2022	-		1.676	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/GTISS -GOV	MIPR	Sandia National Labs : Albuquerque, NM	2.245	0.963	Nov 2020	0.000		0.000		-		0.000	0.000	3.208	0.000
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/GTISS -NGC	SS/CPAF	Northrop Grumman Space and Mission Systems : Azusa, CA	5.082	1.450	Nov 2020	0.000		0.000		-		0.000	0.000	6.532	0.000
C2BMC Development and Deployment - BOA Simulation Development and Integration- EDISS	SS/CPAF	Northrop Grumman Space and Mission Systems : Boulder, CO	0.000	1.451	Oct 2020	0.000		0.000		-		0.000	0.000	1.451	0.000
C2BMC Development and Deployment - C2BMC Hardware/Software Development, Integration & Test (I&T)	SS/CPPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	989.971	123.076	Dec 2020	130.327	Dec 2021	137.805	Dec 2022	-		137.805	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency											Date: April 2022				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>						

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - C2BMC Integration	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) AVIATION AND MISSILE CENTER (AVMC) : Huntsville, AL	176.627	9.528	Nov 2020	7.263	Nov 2021	8.673	Nov 2022	-		8.673	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Mid-Term Discrim-SCOUT OGA	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) AVIATION AND MISSILE CENTER (AVMC) : AL	6.830	0.000		0.000		0.000		-		0.000	0.000	6.830	0.000
C2BMC Development and Deployment - Contract Support Services (CSS)	C/CPFF	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	340.139	35.208	Nov 2020	25.375	Nov 2021	33.597	Nov 2022	-		33.597	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Cybersecurity Upgrades - Development	SS/CPIF	Lockheed Martin : Huntsville, AL; Colorado Springs, CO	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
C2BMC Development and Deployment - ESL/BOA Development	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	53.655	18.553	Oct 2020	28.691	Oct 2021	56.679	Oct 2022	-		56.679	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Federally Funded Research & Development Centers / University Affiliated Research Center	MIPR	MITRE, IDA, ORNL, Aerospace, JHU/APL, GTRI : Arlington, VA/ Huntsville, AL/	216.932	17.904	Oct 2020	15.368	Oct 2021	14.546	Oct 2022	-		14.546	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency											Date: April 2022				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>							

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Colorado Springs, CO													
C2BMC Development and Deployment - IT User Services - IRES	C/CPAF	Jacobs Technical, Inc : AL, AK, CA, CO, HI, NM, VA	7.930	6.046	Mar 2021	6.057	Mar 2022	6.132	Mar 2023	-		6.132	Continuing	Continuing	Continuing
C2BMC Development and Deployment - IT User Services - NGC	SS/CPFF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	9.266	0.000		0.000		0.000		-		0.000	0.000	9.266	0.000
C2BMC Development and Deployment - Independent Performance Assessment and Analysis	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) AVIATION AND MISSILE CENTER (AVMC) : Huntsville, AL	10.112	1.951	Nov 2020	0.865	Nov 2021	7.654	Nov 2022	-		7.654	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Joint Early Warning Lab (JEWL) and C2BMC Lab Build Out	C/CPAF	Jacobs Technical, Inc : Colorado Springs, CO	7.695	1.623	Mar 2021	1.019	Mar 2022	2.179	Mar 2023	-		2.179	Continuing	Continuing	Continuing
C2BMC Development and Deployment - M&S EDISS/GTISS - Industry	C/CPAF	Boeing : Huntsville, AL	4.064	0.000		0.000		0.000		-		0.000	0.000	4.064	4.064
C2BMC Development and Deployment - MDA Civilian, Travel & PCS	Various	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	208.741	20.107	Oct 2020	20.919	Oct 2021	23.151	Oct 2022	-		23.151	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Mobile Sensor Integration Phase II	Various	Various : AL; CO; FL; OH; MA; VA	33.500	0.000		0.000		0.000		-		0.000	0.000	33.500	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency											Date: April 2022				
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>						

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - Models & Simulation	SS/CPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO; NCR	13.882	4.652	Oct 2020	3.720	Oct 2021	1.309	Oct 2022	-		1.309	Continuing	Continuing	Continuing
C2BMC Development and Deployment - OGA Communications Development	MIPR	USAF/SAF : Various	14.389	0.000		0.000		0.000		-		0.000	0.000	14.389	0.000
C2BMC Development and Deployment - Post Intercept Assessment	C/CPFF	SciTec : Newark, NJ	3.683	0.500	Nov 2020	0.000		0.000		-		0.000	0.000	4.183	0.000
C2BMC Development and Deployment - Post Intercept Assessment Hardware	C/CPAF	Northrop Grumman Space and Missile Systems : Colorado Springs, CO	0.713	0.000		0.000		0.000		-		0.000	0.000	0.713	0.000
C2BMC Development and Deployment - Post Intercept Assessment Integration	SS/CPIF	Lockheed Martin Team : Huntsville, AL/Colorado Springs, CO	1.231	0.000		0.000		0.000		-		0.000	0.000	1.231	0.000
C2BMC Development and Deployment - Post Intercept Assessment Prototyping	C/CPFF	Corvid : Huntsville, AL	8.248	0.000		0.000		0.000		-		0.000	0.000	8.248	0.000
C2BMC Development and Deployment - Prior year C2BMC Development and Deployment no longer funded in the FYDP	Various	Various : Various	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	0.000
C2BMC Development and Deployment - Specialized Warfighter Development Program Management	SS/CPAF	Northrop Grumman Space and Mission Systems : Huntsville, AL	5.930	5.495	Mar 2021	0.000		0.000		-		0.000	0.000	11.425	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency												Date: April 2022					
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>						Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>					

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - Spiral Development	MIPR	Sandia, MDA Various : AL; CA; CO; NCR, NM	8.480	4.588	Oct 2020	0.575	Oct 2021	2.617	Oct 2022	-		2.617	Continuing	Continuing	Continuing
C2BMC Development and Deployment - X Lab	SS/CPIF	Lockheed Martin : Huntsville, AL	11.504	2.733	Oct 2020	3.828	Oct 2021	5.485	Oct 2022	-		5.485	Continuing	Continuing	Continuing
C2BMC Communications - Communication Equipment and Fielding	MIPR	DISA, PMDCATS, SPAWAR : Springfield, VA	184.939	33.748	Jan 2021	30.459	Jan 2022	30.495	Jan 2023	-		30.495	Continuing	Continuing	Continuing
C2BMC Communications - Communication Leases	MIPR	DISA : Arlington, VA	65.377	3.820	Oct 2020	4.806	Oct 2021	4.966	Oct 2022	-		4.966	Continuing	Continuing	Continuing
C2BMC Communications - Networks Development and Deployment	SS/CPFF	Lockheed Martin Team : Colorado Springs, CO	28.498	0.000		0.000		0.000		-		0.000	0.000	28.498	0.000
C2BMC Communications - Prior year C2BMC Communications no longer funded in the FYDP	Various	Various : Various	117.019	0.000		0.000		0.000		-		0.000	7.115	124.134	0.000
Classified - Classified Program	MIPR	USAF/SAF : Various	0.000	50.000	Feb 2021	39.743	Feb 2022	0.000		-		0.000	0.000	89.743	0.000
Cruise Missile Defense for Homeland - Cruise Missile Defense for Homeland	MIPR	USAF/SAF : Various	0.000	36.200	Jan 2021	0.000		0.000		-		0.000	0.000	36.200	0.000
Guam Defense Design/ Upgrade C2BMC Battle Management Decision Aids, Planners and Algorithms - Defense of Guam - C2BMC Hardware/ Software Development, Integration & Test (I&T) User NODE (Phase I)	SS/CPIF	LOCKHEED MARTIN CORPORATION : Various	0.000	0.000		0.000		1.185	Nov 2022	-		1.185	Continuing	Continuing	Continuing
Guam Defense Design/ Upgrade C2BMC Battle	MIPR	DOD - DEFENSE INFORMATION	0.000	0.000		0.000		4.306	Nov 2022	-		4.306	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Decision Aids, Planners and Algorithms - Defense of Guam - Communication Equipment and Fielding		SYSTEMS AGENCY (DISA) : VA													
Guam Defense Design/ Upgrade C2BMC Battle Management Decision Aids, Planners and Algorithms - Defense of Guam - ESPN Development	C/CPFF	SCITEC INC : Various	0.000	0.000		0.000		0.861	Nov 2022	-		0.861	Continuing	Continuing	Continuing
Guam Defense Design/ Upgrade C2BMC Battle Management Decision Aids, Planners and Algorithms - Defense of Guam - ESPN/ESL/BOA Development	SS/CPAF	NORTHROP GRUMMAN : CO	0.000	0.000		0.000		13.648	Nov 2022	-		13.648	Continuing	Continuing	Continuing
Subtotal			2,610.267	405.836		339.716		368.950		-		368.950	Continuing	Continuing	N/A

Remarks
N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,610.267	405.836	339.716	368.950	-	368.950	Continuing	Continuing	N/A

Remarks
Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD01 / <i>Command & Control, Battle Management, Communications (C2BMC)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD01 Command & Control, Battle Management, Communications (C2BMC) Planned	1	2021	4	2027
Spiral 8.2-5 Homeland Defense Capability Declaration USNORTHCOM/USINDOPACOM	1	2022	1	2022
Spiral 8.2-5 Homeland Defense Capability Declaration USEUCOM/USCENTCOM	2	2023	2	2023
Expanded Regional and Homeland Defense Capability Declaration USNORTHCOM/USINDOPACOM	2	2024	2	2024
Expanded Regional and Homeland Defense Capability Declaration USEUCOM/USCENTCOM	4	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
MC01: <i>Cyber Operations</i>	62.855	17.132	12.537	8.504	-	8.504	8.255	8.504	8.664	8.839	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2022 to FY 2023 reflects the FY 2022 Congressional Plus Up for improvements to MDS cybersecurity as well as the completion of replacement efforts for high priority hardware no longer supported by the original equipment manufacturer.

A. Mission Description and Budget Item Justification

Command and Control, Battle Management, and Communications (C2BMC) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plan of Action and Milestones (POA&Ms) and Cybersecurity Tools for MDA C2BMC mission systems. Activities in this Project are necessary to comply with the Federal Information Systems Modernization Act (FISMA).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: Network / System Certification and Accreditation (C&A)	17.132	12.537	8.504
Articles:	-	-	-
<p>Description: This activity maintains the Assessment and Authorization (A&A) and Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, Information Assurance Risk Assessment results, and Authorizing Official (AO) accreditation decisions) and Plan of Action and Milestones (POA&Ms) on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) / Security Controls Assessor and the AO. Leverages Cross Domain Solution (CDS) as single authority implementing standard security policies for C2BMC across the BMDS. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems.</p> <ul style="list-style-type: none"> - Conduct cybersecurity design, engineering, and architecture planning for C2BMC information technology systems - Plan and test the cybersecurity controls for C2BMC systems - Conduct Security Controls Assessment testing continuous monitoring of C2BMC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Maintain Cyber posture and support next Increment cyber integration, testing, and fielding into operations 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Support Agile and Development Operations (DevOps) development with cyber integration - Develop Advanced Persistent Threat and Heuristics capabilities with Tier 2 Cybersecurity Service Provider (CSSP) - Facilitate rapid development, test, and deployment of cybersecurity patches into operations as well as cybersecurity improvements to the developmental, operational and test architectures. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Transition Spiral 8.2-5 test assets to support sustainment testing, assessments, and evaluations - Update test labs to support next generation platform technology in support of Spiral 8.2-7 - Upgrade all testbed enclaves with next generation cyber tools <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY 2022 to FY 2023 reflects MDS Cybersecurity Congressional Plus-up and replacement efforts for high priority hardware no longer supported by the original equipment manufacturer.</p>			
Accomplishments/Planned Programs Subtotals	17.132	12.537	8.504

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the DISA supports C2BMC worldwide long-haul communications. C2BMC Program Office government, FFRDC/UARC, and CSS personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source SWDC was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BOA.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Network / System Certification and Accreditation (C&A) - Civ Cyber Labor	Various	MDA Other : Various	1.863	0.540	Oct 2020	0.620	Oct 2021	0.646	Oct 2022	-		0.646	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Consolidated Contractor Support	Various	MDA : Huntsville, AL; Colorado Springs, CO, NCR	3.752	1.623	Oct 2020	1.212	Oct 2021	1.182	Oct 2022	-		1.182	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Core C2BMC	SS/CPAF	Lockheed Martin : Colorado Springs, CO / Huntsville, AL	32.662	11.542	Oct 2020	10.124	Oct 2021	6.081	Nov 2022	-		6.081	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - IA/ CND Network/System C&A	MIPR	Army, Air Force : Various	6.331	0.000		0.000		0.000		-		0.000	0.000	6.331	0.000
Network / System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	Jacobs Technology : Colorado Springs, CO	12.696	3.427	Oct 2020	0.000		0.000		-		0.000	0.000	16.123	0.000
Network / System Certification and Accreditation (C&A) - Lab Infrastructure	SS/CPAF	Northrop Grumman : Colorado Springs, CO	5.551	0.000		0.581	Oct 2021	0.595	Nov 2022	-		0.595	Continuing	Continuing	Continuing
Subtotal			62.855	17.132		12.537		8.504		-		8.504	Continuing	Continuing	N/A

Remarks
N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.855	17.132	12.537	8.504	-	8.504	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency							Date: April 2022			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>			Project (Number/Name) MC01 / <i>Cyber Operations</i>				
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆					
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇					
			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
MC01 Cyber Operations Planned			◇	◇	◇	◇	◇	◇	◇

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MC01 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC01 Cyber Operations Planned	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>				Project (Number/Name) MT01 / <i>C2BMC Test</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
MT01: <i>C2BMC Test</i>	417.802	60.345	65.341	58.616	-	58.616	56.453	64.671	66.276	63.637	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2022 to FY 2023 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

Command and Control, Battle Management and Communications (C2BMC) Test supports system flight and ground testing, wargames, and exercises as detailed in the Missile Defense Agency (MDA) IMTP to ensure C2BMC capabilities delivered are consistent with the Prioritized Capabilities List and are interoperable with other Missile Defense System (MDS) components.

MDA gains efficiencies and minimizes laboratory resource requirements (footprint, personnel, and hardware) by utilizing the C2BMC test bed and the Overhead Persistent Infrared Architecture (OPIR) Capabilities Lab test infrastructure as the laboratory environment supporting System Test, Development, and Sustainment. For System Ground and Flight Test, the labs are used for pre-test analysis, test execution, and post-test analysis. For Development, the labs are utilized for software verification and validation testing and system integration testing. For Sustainment, the labs are used to assist with root cause determination for issues discovered on the fielded system and validation of any required software patches.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: Integrated Master Test Plan	60.345	65.341	58.616
Articles:	-	-	-
Description: This activity funds C2BMC participation in MDS flight and ground testing, wargames and exercises, and resources in accordance with the MDS IMTP. Recurring accomplishments include: Test Execution - Assess MDS interoperability, integration, and functionality in lab and distributed environments, leveraging a complex set of scenarios to test the limits of the C2BMC system. Participate in and analyze results of ground tests and flight tests in accordance with the MDS IMTP. Support all phases of the MDA Ground Test Concept of Operations (CONOPS) and the MDA Flight Test CONOPS. Provide Flight Test Predictive Analysis support. Generate, test, and distribute federated model compatible scenarios for Ground Test and Flight Test Experimentation test support. Use BMDS C2BMC Model (BCM) to support exercise integration testing activities including test case and scenario checkout. - Utilize the Enterprise Sensors Laboratory (ESL) to plan, coordinate, and provide test operations to demonstrate prototype algorithms through flight tests and United States-launched targets of opportunity. The development plans for algorithm			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
<p>improvements focus on track and measurement level sensor data fusion and feature extraction to improve 3-D track formation utilizing a variety of space, airborne, and terrestrial-based sensors. Results from the tests and experiments are provided back to the algorithms development activity to enable algorithm refinement.</p> <ul style="list-style-type: none"> - Continue Long Range Discrimination Radar (LRDR) node integration, testing, and training with new C2BMC Spiral 8.2-5 Homeland Defense baseline changes at the Missile Defense Integration and Operation Center (MDIOC). Retain Existing Sensor Data Interfaces and provide LRDR Data for Risk Reduction for Ground-Based Missile Defense (GMD); Initial Hypersonic Tracking and Reporting; and Cyber Security Enhancements Risk Management Functions. - Utilize the C2BMC Experimentation Laboratory (X-Lab) to plan, coordinate, and provide test operations to demonstrate maturing C2BMC technologies and software builds within an integrated C2BMC environment through flight tests, ground tests, and real-world targets of opportunity before incorporation into formal C2BMC spiral builds. Results from the tests are provided back to the C2BMC and X-Lab development activity. - Participate in wargames and exercises using current and future C2BMC architectures to support all requesting Combatant Commands, North Atlantic Treaty Organization (NATO) partners, and Host Nations allowing warfighters to validate Ballistic Missile Defense (BMD) Techniques, Tactics, and Procedures (TTP) specific to all designated Areas of Operations (AOs) to include current and future C2BMC architectures. - Continue development, sustainment, and upgrades in the C2BMC Testbed (CTB) to support MDA IMTP Events (flight and ground tests). Continue Cyber Testing in the CTB to support continuous C2BMC spiral development. Continue Hardware in the Loop (HWIL) testing, C2BMC, and NATO planning exchanges, demonstrations, and support to NATO live fire events. Maintain Situational Awareness Nodes (Turkey, Romania, and Poland) in accordance with U.S. and Host nation Bi-lateral Agreements. Continue to enhance interoperability between U.S. BMD systems and the NATO BMD systems. Provide infrastructure, network, and troubleshooting support to C2BMC Command Center (CCC), to include the Ballistic Missile Defense System (BMDS) Network Operations and Security Center (BNOSC), System Test and Operations Center (STOC), C2BMC System Support Center (CSSC), BMDS Communications Network (BCN), the Distributed Training system (DTS), and Combined OPIR Laboratories (OCL). <p>Specific and/or unique accomplishments for each FY are as follows:</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Participate in flight and ground test events to support fielding of Spiral 8.2-5 and BOA 7.0 for Homeland Defense by testing the following capabilities: Initial MDS Integration with IBCS, Additional Hit Assessment using SKA, Additional Integration of External Mobile Sensor (MSI Phase IIA) - In flight test events: Continue to collect data for SKA algorithm development. Collect data in support of Hypersonic Tracking capability 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
<p>- In ground test events: Continue to assess C2BMC incremental capability performance, to include support of SKA Hit Assessment fielding; assess alternatives for C2BMC system track typing, correlation, and launch event association processes in the presence of advanced threats. Continue to demonstrate interoperability with Aegis and collect data to assess Aegis Engage-on-Remote (EoR) capability</p> <p>- Continue to assess interoperability of C2BMC S8.2-5, BOA Baseline Release (BBR) 7.0, AN/TPY-2 FBM CX 4.0, LRDR 1.0.1, GS 8B, XBR 4.1.1, EKV 23.2/11.0, IBCS 4.6, PDB 8.1, SBR 19-1, and THAAD 4.0; assess C2BMC planning, monitoring, and tasking capabilities effect on Homeland Defense performance</p> <p>- In cyber events: Assess C2BMC and BOA BBR cyber security in Cooperative Vulnerability and Penetration Assessment (CVPA) events in the lab and operational asset environments; and Adversarial Assessment (AA) events in the operational asset environment prior to fielding</p> <p>- Continue upgrades and implementation of latest DoD required ACAS (Assured Compliance Assessment Solution), ESS (Endpoint Security Services), and Cyber Security increments within the C2BMC Test Bed (CTB)</p> <p>FY 2023 Plans:</p> <p>- Participate in flight test events to support fielding of Spiral 8.2-5 and BOA 7.0 additional capabilities by testing the following capabilities: Initial Integrated Air and Missile Defense Battle Command System (IBCS) Integration into MDS, Hit Assessment using SKA, and Conditioning & debris filtering of MSI tracks</p> <p>- Participate in ground test events to support fielding of Spiral 8.2-7 and BOA 7.1 BMD System Track (BST) with System Level Integrated Discrimination (SLD) by testing the following capabilities: Generation of BST with SLD to support GMD Engagements, BOA 7.1 Integration, SDA refinement, Reporting of Space Object Catalog (SOC) entities to AN/TPY-2 (FBM) Radars and LRDR for use in radar calibration, and Expanded Hypersonic Tracking and Link-16 Reporting</p> <p>- In flight test events: Continue to collect data for SKA algorithm development. Collect data in support of Hypersonic Tracking capability, to assess C2BMC incremental capability performance, to include support of SKA Hit Assessment fielding; assess alternatives for C2BMC system track typing, correlation, and launch event association processes in the presence of advanced threats. Continue to demonstrate interoperability with Aegis and collect data to assess Aegis EoR capability</p> <p>- Continue to assess interoperability of C2BMC S8.2-5, BBR 7.0, AN/TPY-2 FBM CX 4.0, LRDR 1.0.1, GS 8B, XBR 4.1.1, EKV 23.2/11.0, IBCS 4.6, PDB 8.1, SBR 19-1, and THAAD 4.0; assess C2BMC planning, monitoring, and tasking capabilities effect on Homeland Defense performance</p> <p>- Begin to assess interoperability of C2BMC S8.2-7, BOA 7.1, AN/TPY-2 FBM CX 5.0, LRDR 2.0, GS 9, XBR 4.2, EKV 24.0/11.0, IBCS 4.6, PDB 8.1, and THAAD 4.1</p> <p>- In cyber events: Assess C2BMC and BBR cyber security in CVPA events in the lab and operational asset environments; and AA events in the operational asset environment prior to fielding</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
- Continue upgrades and implementation of latest DoD required ACAS, ESS, and Cyber Security increments within the CTB including the OCL - Maintain CTB and OCLs to ensure availability for ground and cyber test events - Prepare, configure, and execute IMTP test events, Pairwise, Continuous Developmental Integration (CDI), and special test request FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY 2022 to FY 2023 is in accordance with the current IMTP.			
Accomplishments/Planned Programs Subtotals	60.345	65.341	58.616

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	305.081	213.382	190.216	-	190.216	196.279	213.945	224.146	238.269	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,195.853	724.028	667.524	-	667.524	870.817	802.617	781.973	765.733	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	259.605	254.962	231.134	-	231.134	250.028	274.705	276.254	257.575	Continuing	Continuing
• 0603890C: <i>BMD Enabling Programs</i>	607.167	623.644	591.847	-	591.847	613.589	625.761	635.633	640.374	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	861.809	639.549	600.072	-	600.072	658.798	574.014	570.018	580.496	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	54.026	52.403	49.367	-	49.367	51.744	56.502	57.833	59.006	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	120.063	147.241	164.668	-	164.668	174.934	215.367	198.956	179.622	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	364.994	389.156	367.824	-	367.824	363.963	421.261	476.991	490.176	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	534.348	560.478	559.513	-	559.513	555.341	623.995	628.146	632.072	Continuing	Continuing
• 0604181C: <i>Hypersonic Defense</i>	267.589	287.796	225.477	-	225.477	108.540	110.220	287.535	449.590	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604672C: <i>Homeland Defense Radar-Hawaii</i>	133.000	75.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	208.000
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	135.088	133.335	75.120	-	75.120	103.451	95.712	71.715	76.316	Continuing	Continuing

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BMDS Overhead Persistent Infrared Architecture (BOA).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	N/A

Remarks
N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-	-	-	-	-	-	-	-	-	-	-	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Master Test Plan - Consolidated Contractor Support	Various	MDA : Huntsville, AL; Colorado Springs, CO; NCR	0.223	0.498	Oct 2020	0.247	Oct 2021	0.252	Oct 2022	-		0.252	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure Support	MIPR	Various : VA; OH; AL; NM; CA	17.189	2.121	Oct 2020	2.099	Oct 2021	1.692	Oct 2022	-		1.692	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure/BOA Infrastructure-MDS Level Testing	SS/CPAF	Northrop Grumman Corporation : Colorado Springs, CO	51.593	2.480	Mar 2021	2.250	Mar 2022	2.617	Mar 2023	-		2.617	Continuing	Continuing	Continuing
Integrated Master Test Plan - FFRDC	MIPR	Institute for Defense Analyses (IDA) : Alexandria, VA	0.350	0.000		0.988	Oct 2021	1.008	Oct 2022	-		1.008	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Master Test Plan - Information Assurance - Test Lab Infrastructure	C/CPAF	Jacobs Technology, Inc : Colorado Springs, CO	0.000	0.000		5.182	Oct 2021	4.514	Oct 2022	-		4.514	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS Level Testing	SS/IDIQ	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	162.731	17.256	Jul 2021	19.484	Jul 2022	15.994	Jul 2023	-		15.994	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS level Testing - Element/System Test Lab Facilities	C/CPAF	Northrop Grumman Corporation : Colorado Springs, CO	23.021	12.977	Mar 2021	14.749	Mar 2022	10.997	Mar 2023	-		10.997	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS level Testing (Element/System Test Lab Facilities)	C/CPAF	Jacobs Technology, Inc : Huntsville, AL; Colorado Springs, CO	59.710	23.809	Mar 2021	19.035	Mar 2022	19.521	Mar 2023	-		19.521	Continuing	Continuing	Continuing
Integrated Master Test Plan - MDS Level Testing GOV	MIPR	Army/Air Force : Various	12.284	1.204	Oct 2020	1.307	Oct 2021	2.021	Oct 2022	-		2.021	Continuing	Continuing	Continuing
Integrated Master Test Plan - Prior year IMTP no longer funded in the FYDP	Various	Various : Various	90.701	0.000		0.000		0.000		-		0.000	0.000	90.701	0.000
Subtotal			417.802	60.345		65.341		58.616		-		58.616	Continuing	Continuing	N/A

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	417.802	60.345	65.341	58.616	-	58.616	Continuing	Continuing	N/A

Remarks
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		
GTD-14 (N/I) (MDS Ground Test)																					◇
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	▲																				
(WG) DEMONSTRATION, TABLE-TOP EXERCISES & EXPERIMENTS 20	◆																				
(EX) JOINT LIVE, VIRTUAL, AND CONSTRUCTIVE 2019/2020	◆																				
(EX) KEEN SWORD 21	◆																				
(EX) AUSTERE CHALLENGE 21	◆	◆																			
(EX) JOINT PROJECT OPTIC WINDMILL 2021	◆	◆																			
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21	◆	◆																			
(EX) AIR AND MISSILE DEFENSE EXERCISE 21	◆	◆	◆																		
(WG) NIMBLE TITAN 22	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Enterprise Sensor Lab Infrastructure Support Planned	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20		▲																			
(EX) RESILIENT SHIELD 21		▲																			
(EX) GLOBAL LIGHTNING 21		◆	◆																		
(EX) EUROPEAN TEST BED 21		◇	◇	◇																	
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21		◇	◇	◇																	
(EX) Joint Live, Virtual, and Constructive 2021/2022		◇	◇	◇	◇	◇	◇	◇	◇												
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)			▲																		
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)			▲																		
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)			▲																		
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)			▲																		
(EX) PACIFIC SENTRY 21			◇																		
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)			▲																		
(WG) HUNTSVILLE WARGAMES 21			◇	◇																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		
(WG) Demonstration, Table-top Exercises & Experiments 21			◇	◇	◇																
(WG) SPACE & MISSILE DEFENSE SYMPOSIUM 21				△																	
GM BVT-03 (GM, DT Interceptor Only Flight Test)				▲																	
(EX) VIGILANT SHIELD 22				◇	◇																
(EX) GLOBAL THUNDER 21				◇	◇																
(EX) KEEN EDGE 22				◇	◇	◇															
GTI-ISR (21) (MDS Ground Test)				◆																	
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)				▲																	
(EX) JUNIPER COBRA 22				◇	◇																
(EX) AIR AND MISSILE DEFENSE EXERCISE 22				◇	◇	◇															
FTT-21 (TH, DT Intercept Flight Test)					△																
(EX) EAGLE RESOLVE 22					△																
(EX) RESILIENT SHIELD 22					△																
(EX) GLOBAL LIGHTNING 22					◇	◇															
(EX) STEADFAST ALLIANCE 22					◇	◇															
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22					◇	◇	◇														
(EX) EUROPEAN TEST BED 22					◇	◇	◇														
FTX-42 (OTHER, DT Target Only Flight Test)						△															
(WG) Demonstration, Table-top Exercises & Experiments 22						◇	◇	◇													
GTI-09 Sprint 1 (E/C) (MDS Ground Test)							◇														
FTX-45							△														
(EX) VIGILANT SHIELD 23							◇	◇													
(EX) KEEN SWORD 23							◇	◇													
(EX) GLOBAL RESPONSE EXERCISE 11							◇	◇													

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		
(EX) GLOBAL THUNDER 22							◇	◇													
(EX) GLOBAL RESPONSE EXERCISE 12							◇	◇													
GTD-08a (N/I) (MDS Ground Test)								◇													
GTD-07b (Aegis Ashore)								◇													
(EX) Joint Project Optic Windmill 2023								◇	◇	◇											
(EX) AIR AND MISSILE DEFENSE EXERCISE 23								◇	◇	◇											
(WG) NIMBLE TITAN 24								◇	◇	◇	◇	◇	◇	◇							
GTI-09 Sprint 2 (E/C) (MDS Ground Test)									◇												
(EX) AUSTERE CHALLENGE 23									◇												
(EX) RESILIENT SHIELD 23									△												
(EX) STEADFAST ARMOUR 23									◇	◇											
(EX) GLOBAL LIGHTNING 23									◇	◇											
(EX) EUROPEAN TEST BED 23									◇	◇	◇										
FTT-25 (TH, DT/OT Intercept Flight Test)										△											
(WG) Huntsville Wargames 23										◇	◇										
(WG) Demonstration, Table-top Exercises & Experiments 23										◇	◇	◇									
(WG) Space & Missile Defense Symposium 23											△										
GTI-ISR (23) (MDS Ground Test)											◇										
FTG-12 (GM, DT/OT Intercept Flight Test)											△										
GTI-08b (N/I)											◇										
(EX) GLOBAL THUNDER 23											◇	◇									
(EX) VIGILANT SHIELD 24											◇	◇									
(EX) KEEN EDGE 24											◇	◇	◇								
FTM-32 (AEGIS SBT, DT/OT Intercept Flight Test)												△									

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇

	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027		
(EX) AIR AND MISSILE DEFENSE EXERCISE 24										◆	◆	◆									
GTI-ASI (24) (MDS Ground Test)										◆											
FTX-28 E2 (TH, DT/OT Tracking Exercise Flight Test)										△											
FTX-28 E1 (TH, DT/OT Tracking Exercise Flight Test)										△											
FTX-28 E3 (TH, DT/OT Tracking Exercise Flight Test)										△											
GTD-08b (N/I)										◆											
FTM-37 (AEGIS 5.1, DT/OT Intercept Flight Test)										△											
GTI-13 Sprint 1 (N/I) (MDS Ground Test)													◆								
GTI-ISR (25) (MDS Ground Test)														◆							
GTI-12 Sprint 1 (E/C) (MDS Ground Test)															◆						
GTI-13 Sprint 2 (N/I) (MDS Ground Test)															◆						
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)																△					
GTD-13 (N/I) (MDS Ground Test)																◆					
GTI-10 (E/C) (MDS Ground Test)																	◆				
GTI-12 Sprint 2 (E/C) (MDS Ground Test)																	◆				
GTD-10 (E/C) (MDS Ground Test)																		◆			
GTD-12 (E/C) (MDS Ground Test)																		◆			
GTI-ASI (26) (MDS Ground Test)																			◆		
GTI-14 Sprint 1 (N/I)																				◆	
FTM-41 (AEGIS 5.1, DT/OT Intercept Flight Test)																				△	
FTG-16 (GM, DT Intercept Flight Test)																					△
GTI-14 (N/I) Sprint 2 (MDS Ground Test)																					◆
GTI-15 Sprint 1 (E/C) (MDS Ground Test)																					◆
FTG-17 (GM, DT/OT Intercept Flight Test)																					△

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆																																																																				
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇																																																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3">FY 2021</th> <th colspan="3">FY 2022</th> <th colspan="3">FY 2023</th> <th colspan="3">FY 2024</th> <th colspan="3">FY 2025</th> <th colspan="3">FY 2026</th> <th colspan="3">FY 2027</th> </tr> </thead> <tbody> <tr> <td>GTI-ISR (27) (MDS Ground Test)</td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td align="right">◇</td> </tr> <tr> <td>FTM-42 (AEGIS 5.1, DT/OT Intercept Flight Test)</td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td></td><td></td><td></td> <td align="right">△</td> </tr> </tbody> </table>						FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027			GTI-ISR (27) (MDS Ground Test)																						◇	FTM-42 (AEGIS 5.1, DT/OT Intercept Flight Test)																						△
	FY 2021			FY 2022			FY 2023			FY 2024			FY 2025			FY 2026			FY 2027																																																					
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FTM-42 (AEGIS 5.1, DT/OT Intercept Flight Test)																						△																																																		

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GTD-14 (N/I) (MDS Ground Test)	4	2027	4	2027
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
(WG) DEMONSTRATION, TABLE-TOP EXERCISES & EXPERIMENTS 20	1	2021	1	2021
(EX) JOINT LIVE, VIRTUAL, AND CONSTRUCTIVE 2019/2020	1	2021	1	2021
(EX) KEEN SWORD 21	1	2021	1	2021
(EX) AUSTERE CHALLENGE 21	1	2021	2	2021
(EX) JOINT PROJECT OPTIC WINDMILL 2021	1	2021	2	2021
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21	1	2021	2	2021
(EX) AIR AND MISSILE DEFENSE EXERCISE 21	1	2021	3	2021
(WG) NIMBLE TITAN 22	1	2021	4	2022
Enterprise Sensor Lab Infrastructure Support Planned	1	2021	4	2027
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20	2	2021	2	2021
(EX) RESILIENT SHIELD 21	2	2021	2	2021
(EX) GLOBAL LIGHTNING 21	2	2021	3	2021
(EX) EUROPEAN TEST BED 21	2	2021	4	2021
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21	2	2021	4	2021
(EX) Joint Live, Virtual, and Constructive 2021/2022	2	2021	1	2023
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)	3	2021	3	2021
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)	3	2021	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) PACIFIC SENTRY 21	3	2021	3	2021
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)	3	2021	3	2021
(WG) HUNTSVILLE WARGAMES 21	3	2021	4	2021
(WG) Demonstration, Table-top Exercises & Experiments 21	3	2021	1	2022
(WG) SPACE & MISSILE DEFENSE SYMPOSIUM 21	4	2021	4	2021
GM BVT-03 (GM, DT Interceptor Only Flight Test)	4	2021	4	2021
(EX) VIGILANT SHIELD 22	4	2021	1	2022
(EX) GLOBAL THUNDER 21	4	2021	1	2022
(EX) KEEN EDGE 22	4	2021	2	2022
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)	1	2022	1	2022
(EX) JUNIPER COBRA 22	1	2022	2	2022
(EX) AIR AND MISSILE DEFENSE EXERCISE 22	1	2022	3	2022
FTT-21 (TH, DT Intercept Flight Test)	2	2022	2	2022
(EX) EAGLE RESOLVE 22	2	2022	2	2022
(EX) RESILIENT SHIELD 22	2	2022	2	2022
(EX) GLOBAL LIGHTNING 22	2	2022	3	2022
(EX) STEADFAST ALLIANCE 22	2	2022	3	2022
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22	2	2022	4	2022
(EX) EUROPEAN TEST BED 22	2	2022	4	2022
FTX-42 (OTHER, DT Target Only Flight Test)	3	2022	3	2022
(WG) Demonstration, Table-top Exercises & Experiments 22	3	2022	1	2023
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	4	2022	4	2022
FTX-45	4	2022	4	2022
(EX) VIGILANT SHIELD 23	4	2022	1	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
(EX) KEEN SWORD 23	4	2022	1	2023
(EX) GLOBAL RESPONSE EXERCISE 11	4	2022	1	2023
(EX) GLOBAL THUNDER 22	4	2022	1	2023
(EX) GLOBAL RESPONSE EXERCISE 12	4	2022	1	2023
GTD-08a (N/I) (MDS Ground Test)	1	2023	1	2023
GTD-07b (Aegis Ashore)	1	2023	1	2023
(EX) Joint Project Optic Windmill 2023	1	2023	3	2023
(EX) AIR AND MISSILE DEFENSE EXERCISE 23	1	2023	3	2023
(WG) NIMBLE TITAN 24	1	2023	4	2024
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2023	2	2023
(EX) AUSTERE CHALLENGE 23	2	2023	2	2023
(EX) RESILIENT SHIELD 23	2	2023	2	2023
(EX) STEADFAST ARMOUR 23	2	2023	3	2023
(EX) GLOBAL LIGHTNING 23	2	2023	3	2023
(EX) EUROPEAN TEST BED 23	2	2023	4	2023
FTT-25 (TH, DT/OT Intercept Flight Test)	3	2023	3	2023
(WG) Huntsville Wargames 23	3	2023	4	2023
(WG) Demonstration, Table-top Exercises & Experiments 23	3	2023	1	2024
(WG) Space & Missile Defense Symposium 23	4	2023	4	2023
GTI-ISR (23) (MDS Ground Test)	4	2023	4	2023
FTG-12 (GM, DT/OT Intercept Flight Test)	4	2023	4	2023
GTI-08b (N/I)	4	2023	4	2023
(EX) GLOBAL THUNDER 23	4	2023	1	2024
(EX) VIGILANT SHIELD 24	4	2023	1	2024
(EX) KEEN EDGE 24	4	2023	2	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
FTM-32 (AEGIS SBT, DT/OT Intercept Flight Test)	1	2024	1	2024
(EX) AIR AND MISSILE DEFENSE EXERCISE 24	1	2024	3	2024
GTI-ASI (24) (MDS Ground Test)	2	2024	2	2024
FTX-28 E2 (TH, DT/OT Tracking Exercise Flight Test)	2	2024	2	2024
FTX-28 E1 (TH, DT/OT Tracking Exercise Flight Test)	2	2024	2	2024
FTX-28 E3 (TH, DT/OT Tracking Exercise Flight Test)	2	2024	2	2024
GTD-08b (N/I)	2	2024	2	2024
FTM-37 (AEGIS 5.1, DT/OT Intercept Flight Test)	3	2024	3	2024
GTI-13 Sprint 1 (N/I) (MDS Ground Test)	1	2025	1	2025
GTI-ISR (25) (MDS Ground Test)	2	2025	2	2025
GTI-12 Sprint 1 (E/C) (MDS Ground Test)	3	2025	3	2025
GTI-13 Sprint 2 (N/I) (MDS Ground Test)	3	2025	3	2025
FTM-30 (AEGIS 5.1, DT/OT Intercept Flight Test)	4	2025	4	2025
GTD-13 (N/I) (MDS Ground Test)	4	2025	4	2025
GTI-10 (E/C) (MDS Ground Test)	1	2026	1	2026
GTI-12 Sprint 2 (E/C) (MDS Ground Test)	1	2026	1	2026
GTD-10 (E/C) (MDS Ground Test)	2	2026	2	2026
GTD-12 (E/C) (MDS Ground Test)	2	2026	2	2026
GTI-ASI (26) (MDS Ground Test)	3	2026	3	2026
GTI-14 Sprint 1 (N/I)	4	2026	4	2026
FTM-41 (AEGIS 5.1, DT/OT Intercept Flight Test)	1	2027	1	2027
FTG-16 (GM, DT Intercept Flight Test)	2	2027	2	2027
GTI-14 (N/I) Sprint 2 (MDS Ground Test)	2	2027	2	2027
GTI-15 Sprint 1 (E/C) (MDS Ground Test)	3	2027	3	2027
FTG-17 (GM, DT/OT Intercept Flight Test)	4	2027	4	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency			Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MT01 / <i>C2BMC Test</i>		

Events	Start		End	
	Quarter	Year	Quarter	Year
GTI-ISR (27) (MDS Ground Test)	4	2027	4	2027
FTM-42 (AEGIS 5.1, DT/OT Intercept Flight Test)	4	2027	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
MX01: <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>	841.802	129.960	125.086	131.903	-	131.903	138.665	139.480	142.259	145.342	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2022 to FY 2023 provides additional Integrated Logistics Support (ILS) training material and engineering support for Spiral 8.2-5 and for preparation for development of Increment 9 training hardware and software.

A. Mission Description and Budget Item Justification

C2BMC Development Support provides operations engineering, integrated logistics, warfighter integration, deployment, and disposal of the current operational system and/or systems fielded in USSTRATCOM, USNORTHCOM, USINDOPACOM, USEUCOM, USCENTCOM, and U.S. Space Command (USSPACECOM) and the operation of the C2BMC Control Center. This activity provides continuous support of the development, deployment, sustainment of the C2BMC training systems, and updates training material to stay current with fielded capabilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: Operations Engineering	104.084	107.728	113.079
Articles:	-	-	-
<p>Description: This activity funds C2BMC support of current operational, test, and training systems. Recurring efforts include:</p> <ul style="list-style-type: none"> - On-site maintenance, help-desk support, and developer reach-back support to ensure operational availability - C2BMC Command Center (CCC) provides 24 hours a day, 7 days a week, 365 days a year Ballistic Missile Defense System (BMDS) Overhead Persistent Infra-Red (OPIR) Architecture (BOA) and C2BMC operations including system and network monitoring, system administration, and network defense against cyber-attacks - Integrated logistics support by providing a secure supply chain; reliability, availability, and maintainability (RAM) engineering; obsolescence engineering; and sparing to ensure operational availability - Cybersecurity engineering providing C2BMC Commercial-off-the-shelf (COTS) software/hardware updates and CCC upgrades that address system vulnerabilities, field quarterly updates to reduce system component vulnerability to cyber-attacks - Information System Security Officers (ISSOs) ensuring C2BMC compliance with latest cybersecurity requirements and policies - System modifications driven by Warfighter Involvement Process (WIP), Continuous Improvement Process (CIP), RAM and obsolescence engineering, and external systems such as Space-Based Infrared Sensors (SBIRS), Ground-based 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2021	FY 2022	FY 2023
<p>Midcourse Defense (GMD) Fire Control (GFC), Aegis, Terminal High Altitude Area Defense (THAAD), Navy Link Monitoring and Management Tool (LMMT), AN/TPY-2, standard Army communications, Defense Information Systems Agency (DISA) fiber networks, and Allied/Coalition interfaces</p> <ul style="list-style-type: none"> - Combatant Command (CCMD) integration providing C2BMC training, on-site Subject Matter Experts (SMEs), and surge SME support for real-world events, flight tests, ground tests, exercises, cyber assessments, and wargames - Facility modifications required to house current or future C2BMC equipment and transportation for moving C2BMC equipment - Integrated product support for tactical satellite communications (SATCOM) used in flight tests, hardened SATCOM, and associated shelters - Provide transportation for flight test equipment and SME support and analysis for numerous test, exercise, and real world events - Provide recurring proficiency training to CCMDs and keep training material and systems consistent with operational capabilities <p>Specific and/or unique accomplishments for each FY are as follow:</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Transition from providing sustainment of fielded EPAA Phase 3/EOR (Spiral 8.2-3) deployed to USEUCOM, USCENTCOM, USNORTHCOM, and USINDOPACOM to Spiral 8.2-5. - Execute final deployment and integration and testing for LRDR for Homeland Defense (Spiral 8.2-5) - Continue hardware updates and software licenses to support protection of the system from vulnerability and operational sustainment <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Begin sustainment of S8.2-5/BOA 7.0 capabilities - Complete BMDS Teleport Gateway architecture redesign, engineering and installation <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY 2022 to FY 2023 provides additional ILS training material and engineering support for Spiral 8.2-5.</p>				
Title: Concurrent Test, Training, and Operations (CTTO)		25.876	17.358	18.824
Description: This element provides the development and sustainment of the C2BMC Training Support System (TSS) and the Missions Specific Vendor Plug-in (MSVP) stand-alone operator training devices and the Distributed Training System (DTS) for USINDOPACOM, USNORTHCOM, USEUCOM, USCENTCOM, and USSPACECOM. C2BMC connects all Missile Defense System (MDS) Elements through virtual and physical networks to facilitate integrated test, training, operations, and certification within two coexistent realms. This enables the warfighter to become proficient on current and future software versions at the		Articles: -	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
operational console, increases the developer's capacity to perform a variety of tests and upgrades on the operational MDS, and decreases recall-to-mission operations times from weeks and days to hours and minutes. The recently acquired C2BMC MSVP is a gaming-based stand-alone trainer developed from a SBIR project. It delivers mission training simulation using core Standard Space Trainer (SST) and provides the same level of training fidelity as the legacy TSS but with greater flexibility in architecture and reduced long term cost. Recurring accomplishments include sustaining current training systems for MDS training events for the Unified Combatant Command developing the next generation training systems, to include the integration of Red Force / Blue Force capability, to keep current with the operational system capabilities.			
Specific and/or unique accomplishments for each FY are as follows:			
FY 2022 Plans: - Modifications of MSVP and DTS for inclusion of the capabilities that are planned for delivery in Spiral 8.2-7 - Continue support and deployment activities of MDS LRDR for Homeland Defense (Spiral 8.2-5) for MSVP and DTS - Complete C2BMC Increment 5 (Spiral 8.2-3) training efforts			
FY 2023 Plans: - Continue MSVP and DTS development for inclusion of the capabilities that are planned for delivery in Spiral 8.2-7 - Provide hardware updates for DTS simulation and stimulation			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase from FY 2022 to FY 2023 provides for preparation for development of Increment 9 training hardware and software.			
Accomplishments/Planned Programs Subtotals	129.960	125.086	131.903

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603881C: <i>Ballistic Missile Defense Terminal Defense Segment</i>	305.081	213.382	190.216	-	190.216	196.279	213.945	224.146	238.269	Continuing	Continuing
• 0603882C: <i>Ballistic Missile Defense Midcourse Defense Segment</i>	1,195.853	724.028	667.524	-	667.524	870.817	802.617	781.973	765.733	Continuing	Continuing
• 0603884C: <i>Ballistic Missile Defense Sensors</i>	259.605	254.962	231.134	-	231.134	250.028	274.705	276.254	257.575	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603890C: <i>BMD Enabling Programs</i>	607.167	623.644	591.847	-	591.847	613.589	625.761	635.633	640.374	Continuing	Continuing
• 0603892C: <i>AEGIS BMD</i>	861.809	639.549	600.072	-	600.072	658.798	574.014	570.018	580.496	Continuing	Continuing
• 0603904C: <i>Missile Defense Integration and Operations Center (MDIOC)</i>	54.026	52.403	49.367	-	49.367	51.744	56.502	57.833	59.006	Continuing	Continuing
• 0603907C: <i>Sea Based X-Band Radar (SBX)</i>	120.063	147.241	164.668	-	164.668	174.934	215.367	198.956	179.622	Continuing	Continuing
• 0603914C: <i>Ballistic Missile Defense Test</i>	364.994	389.156	367.824	-	367.824	363.963	421.261	476.991	490.176	Continuing	Continuing
• 0603915C: <i>Ballistic Missile Defense Targets</i>	534.348	560.478	559.513	-	559.513	555.341	623.995	628.146	632.072	Continuing	Continuing
• 0604181C: <i>Hypersonic Defense</i>	267.589	287.796	225.477	-	225.477	108.540	110.220	287.535	449.590	Continuing	Continuing
• 0604672C: <i>Homeland Defense Radar-Hawaii</i>	133.000	75.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	208.000
• 0604873C: <i>Long Range Discrimination Radar (LRDR)</i>	135.088	133.335	75.120	-	75.120	103.451	95.712	71.715	76.316	Continuing	Continuing

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the DISA supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BOA. A SBIR Phase III contract with Sonalysts provides a standalone training system which delivers mission training.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations Engineering - Operations Engineering - Contract Support Services (CSS)	MIPR	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	4.103	0.835	Oct 2020	0.609	Oct 2021	0.626	Nov 2022	-		0.626	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Indirect Support	MIPR	DISA DECC/DISA TECC : Various	48.028	0.000		0.000		0.000		-		0.000	0.000	48.028	0.000
Operations Engineering - Operations Engineering - Specialized Warfighter Development Contract	SS/CPAF	Northrop Grumman Corporation : Huntsville, AL	0.693	0.000		0.000		0.000		-		0.000	0.000	0.693	0.000
Operations Engineering - Operations Engineering - Sustaining Support	C/CPAF	Jacobs Technology : Huntsville, AL; Colorado Springs, CO	4.897	2.190	Oct 2020	1.810	Mar 2022	1.847	Nov 2022	-		1.847	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Training Support	C/FPIF	Boeing : Huntsville, AL	2.282	0.921	Oct 2020	1.666	Oct 2021	1.813	Nov 2022	-		1.813	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Unit Personnel, Control System Improvement Sustaining Support	MIPR	Army, Navy, Air Force : Various	20.268	6.462	Oct 2020	12.565	Oct 2021	12.095	Nov 2022	-		12.095	Continuing	Continuing	Continuing
Operations Engineering - Prior year Operations Engineering no longer funded in the FYDP	Various	Various : Various	9.845	0.000		0.000		0.000		-		0.000	0.000	9.845	9.845
Operations Engineering - Unit Personnel, Control System Improvement, Sustaining Support	SS/CPFF	Lockheed Martin Team : Huntsville, AL	590.446	93.676	Dec 2020	91.078	Dec 2021	96.698	Dec 2022	-		96.698	Continuing	Continuing	Continuing
Concurrent Test, Training, and Operations (CTTO) -	SS/CPFF	Sonalysts : Waterford, CT	7.049	8.726	Dec 2020	2.765	Dec 2021	2.707	Dec 2022	-		2.707	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
(Training Enhancements) MSVP																
Concurrent Test, Training, and Operations (CTTO) - CTTO/Training Enhancements	MIPR	DOD - USA - COMBAT CAPABILITIES DEVELOPMENT COMMAND (CCDC) AVIATION AND MISSILE CENTER (AVMC) : Huntsville, AL	21.652	6.184	Dec 2020	8.388	Dec 2021	7.823	Dec 2022	-		7.823	Continuing	Continuing	Continuing	
Concurrent Test, Training, and Operations (CTTO) - Prior year CTTO no longer funded in the FYDP	Various	Various : Various	8.443	0.000		0.000		0.000		-		0.000	0.000	8.443	4.610	
Concurrent Test, Training, and Operations (CTTO) - Training Enhancements	SS/CPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	124.096	10.966	Dec 2020	6.205	Dec 2021	8.294	Dec 2022	-		8.294	Continuing	Continuing	Continuing	
Subtotal			841.802	129.960		125.086		131.903		-		131.903	Continuing	Continuing	N/A	

Remarks
N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Subtotal			-	-		-		-		-		-	-	-	N/A	

Remarks
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks
N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	841.802	129.960	125.086	131.903	-	131.903	Continuing	Continuing	N/A

Remarks
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆														
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 16.6%;">FY 2021</th> <th style="width: 16.6%;">FY 2022</th> <th style="width: 16.6%;">FY 2023</th> <th style="width: 16.6%;">FY 2024</th> <th style="width: 16.6%;">FY 2025</th> <th style="width: 16.6%;">FY 2026</th> <th style="width: 16.6%;">FY 2027</th> </tr> </thead> <tbody> <tr> <td>◆</td><td>◆</td><td>◆</td><td>◆</td><td>◆</td><td>◆</td><td>◆</td> </tr> </tbody> </table>					FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	◆	◆	◆	◆	◆	◆	◆
FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027												
◆	◆	◆	◆	◆	◆	◆												

MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support Planned

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MX01 / <i>Command & Control, Battle Management, Communications (C2BMC) Development Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support Planned	1	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>					Project (Number/Name) MD40 / <i>Program-Wide Support</i>		
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	169.217	25.754	22.266	21.401	-	21.401	20.724	20.171	23.144	23.080	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: Program Wide Support	25.754	22.266	21.401
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023
unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.			
<i>FY 2022 Plans:</i> - SEE ABOVE.			
<i>FY 2023 Plans:</i> - SEE ABOVE.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> N/A			
Accomplishments/Planned Programs Subtotals	25.754	22.266	21.401

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	6.277	0.000		0.000		0.000		-		0.000	6.277	12.554	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	NETWORK MANAGEMENT RESOURCES, INC. : AL	15.188	7.899	Jul 2021	4.146	Jul 2022	2.870	Dec 2022	-		2.870	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Veterans Technology, LLC : AL	23.049	0.510	Nov 2020	0.586	Nov 2021	0.498	Nov 2022	-		0.498	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services Civilian Salaries, Travel, Training	Various	MDA : AL	72.329	16.765	Oct 2020	16.884	Oct 2021	17.537	Oct 2022	-		17.537	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	IA	Department of State Embassies : VA	0.037	0.050	Nov 2020	0.050	Oct 2021	0.039	Oct 2022	-		0.039	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	JHU/APL : AL, VA	0.301	0.530	Dec 2020	0.600	Jan 2022	0.457	Jan 2023	-		0.457	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	52.036	0.000		0.000		0.000		-		0.000	0.000	52.036	0.000
Subtotal			169.217	25.754		22.266		21.401		-		21.401	Continuing	Continuing	N/A

Remarks
N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	169.217	25.754	22.266	21.401	-	21.401	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Missile Defense Agency							Date: April 2022		
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>			Project (Number/Name) MD40 / <i>Program-Wide Support</i>			

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Missile Defense Agency **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Command and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
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Significant Event Complete ▲	Milestone Decision Complete ★	Element Test Complete ◆	System Level Test Complete ●	Complete Activity ◆					
Significant Event Planned △	Milestone Decision Planned ☆	Element Test Planned ◇	System Level Test Planned ○	Planned Activity ◇					
			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
MD40 Program-Wide Support			◇	◇	◇	◇	◇	◇	◇

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Missile Defense Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / <i>Ballistic Missile Defense Co mmand and Control, Battle Management & Communication</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2021	4	2027