

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency **Date:** May 2021

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 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	2,373.928	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
MD07: <i>THAAD</i>	1,953.852	185.483	259.923	251.192	-	251.192	-	-	-	-	-	-
MC07: <i>Cyber Operations</i>	18.761	15.037	9.806	11.977	-	11.977	-	-	-	-	-	-
MD06: <i>Patriot Advanced Capability-3 (PAC-3)</i>	297.424	86.767	26.198	1.226	-	1.226	-	-	-	-	-	-
MD40: <i>Program-Wide Support</i>	103.891	8.025	16.390	13.554	-	13.554	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense (BMD) Terminal Defense Segment provides vital forward-deployable capabilities to support regional defensive Missile Defense System (MDS) operations. The Terminal High Altitude Area Defense (THAAD) system provides Combatant Commands (CCMD) a globally-transportable, rapidly-deployable capability to intercept and destroy short-range, medium-range, and limited intermediate-range missile threats inside or outside the atmosphere during terminal phase of flight. This Program Element investigates concepts and continues the development and integration of multiple, independent THAAD software upgrades to address the evolving threat, improve warfighter's defense planning, and improve capabilities to engage short-range ballistic missile (SRBM), medium-range ballistic missile (MRBM), and limited intermediate-range ballistic missile (IRBM) threats.

B. Program Change Summary (\$ in Millions)

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	306.761	412.627	340.071	-	340.071
Current President's Budget	295.312	312.317	277.949	-	277.949
Total Adjustments	-11.449	-100.310	-62.122	-	-62.122
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-102.500			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	2.190			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-7.557	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-3.892	0.000	-62.122	-	-62.122

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency Date: May 2021

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>
---	---

Change Summary Explanation

Decrease of \$102.5 million in FY 2021 reflects Congressional reduction for THAAD underlay lack of validated requirement and acquisition strategy [Concept of Operations (CONOPS) development and analysis only].

Increase of \$2.2 million in FY 2021 provides a portion of the undistributed Congressional add to restore Defense Wide Review (DWR) Missile Defense Agency manpower reduction.

Decrease of \$62.1 million in FY 2022 reflects reduced requirement for the THAAD Layered Homeland Defense effort and efficiencies.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD07: <i>THAAD</i>	1,953.852	185.483	259.923	251.192	-	251.192	-	-	-	-	-	-
Quantity of RDT&E Articles	50	-	-	-	-	-	-	-	-	-	-	-

Note

Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

The THAAD system provides a capability to intercept and destroy short-range, medium-range, and limited intermediate-range missile threats inside or outside the atmosphere during the terminal phase of flight. THAAD continues the development and integration of multiple, independent software upgrades to address the evolving threat, improve the Warfighter's defense planning, and improve capabilities to engage SRBM, MRBM, and limited IRBM threats.

THAAD Development continues the development and integration of multiple, independent software builds to deliver enhanced system capabilities and expand the defense of allies and deployed forces from short-to-intermediate-range threats.

Program Operations provides strategic planning, program integration, cost estimating, contracting, financial management, internal reviews and audits, earned-value management and program assessments for the THAAD Program Office.

JEON provides enhanced capability against specific threats by expanding engagement options and increasing coverage areas.

Project Redwood details are provided at a Higher Classification reported in accordance with Title 10, United States Code, Section 119 (a)(1) in the Special Access Program Annual Report to Congress.

THAAD Program Support provides support for communications and interoperability efforts to operate on multiple networks and safety and mission assurance efforts in support of the Materiel Release process.

THAAD Layered Homeland Defense effort supports the demonstration of weapon system and interceptor improvements to enhance THAAD capabilities against evolving threats. This effort will leverage the existing design improvement activities and develop software and hardware enhancements that demonstrate THAAD capabilities for regional and homeland applications. Demonstrations will be performed both at the component level and a flight test.

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

	FY 2020	FY 2021	FY 2022
Title: Terminal High Altitude Area Defense (THAAD) Development	93.677	156.894	126.217
Articles:	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
<p>Description: The THAAD Development program continues the development and integration of multiple, independent software builds to deliver enhanced system capabilities and expand the defense of allies and deployed forces from short-to-intermediate-range threats.</p> <p>Software Build 4.0: THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON) (scheduled to be completed in 4QFY2021)</p> <ul style="list-style-type: none"> - Initial requirements to integrate MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability in support of JEON. - Improved capability to engage short-range ballistic missile (SRBM), medium-range ballistic missile (MRBM) and limited intermediate-range ballistic missile (IRBM) threats capable of creating complex scenes. - Expanded requirements for THAAD Electronic Protection/Objective Debris Mitigation to provide radar enhancements improving performance against adverse environments. <p>Software Build 4.1: Global Materiel Release Updates for Expanded THAAD (scheduled to be completed in 2QFY2023)</p> <ul style="list-style-type: none"> - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate approvals. - Interface Change Proposal: Implements necessary Link-16 software interface changes to align with MDS interoperability. - Radio Frequency (RF) Remote Launcher: Develops software capability for RF remote launcher capability. - Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: Project Manager for Short and Intermediate Effectors for Layered Defense (PM SHIELD) integration and support. <p>Software Build 5.0: THAAD Updates to Maintain Mission Assurance (scheduled to be completed in 1QFY2025)</p> <ul style="list-style-type: none"> - MSE Safety Integration: Integrates additional MSE safety improvements and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - RF Remote Launcher: Hardware Integration for increased defended area footprints via THAAD Remote Launcher Part 2. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

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

- Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures.
- Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques.
- Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system.
- Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location.
- Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations.

Recurring efforts include:

- Support element Models and Simulations (M&S) related activities, to include Verification, Validation and Accreditation (VV&A) and Continuous Digital Assessment (CDA) on the path of accredited models and simulations for MDS assessment.
- Support M&S related activities in element and MDS test events in the approved Integrated Master Test Plan (IMTP) such as requirements, design, development, and VV&A.
- Design, develop, test, and field the releases of THAAD system software to ensure continued performance and operation of fielded batteries.
- Provide software updates in support of the incremental evolution of performance upgrades.
- Support laboratory assets and equipment to enable future development, and to isolate, identify, and remedy root causes of equipment and software deficiencies identified by the warfighter.
- Perform requirements development, engineering analysis, and performance verification for THAAD development and MDS integration to ensure THAAD compliance with the MDS Specification, MDS System Description Document, and Master Integration Plan.
- Participate in Missile Defense Agency (MDA) and Army studies to determine the architecture and integration of the THAAD Weapon system into the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS).
- Provide and coordinate analysis, studies and papers to support the resolution of issues and concerns with the integration of the THAAD weapon system into the future Army IBCS architecture.
- Development of improved tactical network architecture in order to increase availability, robustness, and security of the system to counter cybersecurity threats.

FY 2020	FY 2021	FY 2022

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
<p>- Incremental Development Process to identify THAAD evolution and synchronize requirements that address emerging threat evolution, obsolescence needs, Army training needs, reliability and sustainment issues.</p> <p>- Perform Independent Verification and Validation (IV&V) of software and software assurance risk report.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2021 Plans: Software Build 4.0 Complete development efforts and integration to include the following: - THAAD/MSE Integration (JEON) into the THAAD Weapon System. - Expanded THAAD Electronic Protection/Objective Debris Mitigation.</p> <p>Software Build 4.1 Provides funding to initiate development and integration efforts to include: - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate (ATO) approvals. - Interface Change Proposal: Implements necessary Link-16 software interface changes to align with MDS interoperability. - RF Remote Launcher: Develops software capability for RF remote launcher capability. - AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability while providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: PM SHIELD integration and support.</p> <p>Software Build 5.0 Provides funding for development, trade studies and early engineering efforts to include: - MSE Safety Integration: Integrates additional MSE safety capabilities and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
<p>- Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system.</p> <p>- Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location.</p> <p>- Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations.</p> <p>- Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures.</p> <p>FY 2022 Plans: Software Build 4.1 Provides funding to continue development and integration efforts to include: - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate (ATO) approvals - Interface Change Proposals: Implements necessary Link-16 software interface changes to align with MDS interoperability - RF Remote Launcher: Develops software capability for RF remote launcher capability - AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability while providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: PM SHIELD integration and support.</p> <p>Software Build 5.0 Provides funding for development and integration efforts to include: - MSE Safety Integration: Integrates additional MSE safety improvements and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - RF Remote Launcher: Hardware Integration for increased defended area footprints via THAAD Remote Launcher Part 2. - Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2020	FY 2021	FY 2022
<p>- Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques.</p> <p>- Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system.</p> <p>- Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location</p> <p>- Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations.</p> <p>- AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 6.0) into THAAD weapon system which ensures system functionality and interoperability providing the capability to track and discriminate evolving threats.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON) and efficiencies.</p>				
Title: Program Operations		44.804	50.054	46.402
		Articles:	-	-
<p>Description: Program Operations provides strategic planning, program integration, contracting, acquisition, engineering, financial management, internal reviews and audits, and program assessments for the THAAD Program Office.</p> <p>Recurring efforts include:</p> <ul style="list-style-type: none"> -Provide technical and business management support activities to provide the Program Director with critical program status and decision quality data. -Ensure THAAD program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process. -Conduct internal program reviews to measure program progress against the six MDA approved baselines. -Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs. -Provide Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter. 				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows:				
<p>FY 2021 Plans: -SEE ABOVE.</p> <p>FY 2022 Plans: -SEE ABOVE.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: N/A.</p>				
Title: JEON		33.300	3.200	0.000
		Articles: -	-	-
<p>Description: This accomplishment fully funds the THAAD portion of JEON to deliver expanded engagement options and increased coverage area. This includes accelerating some content previously included in the THAAD Development accomplishment, while adding new development efforts which include Rapid Deployment of Command and Control and Software upgrades and Performance Optimization Against Additional Threats as well as the following three new priorities:</p> <ol style="list-style-type: none"> 1) U.S. Army's Phased Array Tracking Radar Intercept on Target (PATRIOT) Launch on Remote to utilize THAAD's capability to detect and track threat ballistic missiles at longer ranges. 2) THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability. 3) THAAD Remote Launcher Part 1 that utilizes flexible communication paths to extend the defended area of a THAAD battery. <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2021 Plans: -Complete THAAD/MSE Integration Part 1 integrating MSE launchers and missiles in to the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability.</p> <p>FY 2022 Plans: -N/A.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON).				
<p>Title: Project Redwood- Details at a Higher Classification</p> <p align="right">Articles:</p> <p>Description: This project is reported in accordance with Title 10, United States Code, Section 119 (a)(1) in the Special Access Program (SAP) Annual Report to Congress.</p> <p>FY 2021 Plans: -SEE ABOVE.</p> <p>FY 2022 Plans: -SEE ABOVE.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.</p>		11.930 -	10.493 -	12.052 -
<p>Title: THAAD Program Support</p> <p align="right">Articles:</p> <p>Description: This activity provides support for efforts such as communications and interoperability upgrades to operate on joint, service, or allied communications networks. This activity provides support for safety and mission assurance requirements, and support of independent government offices as part of the Materiel Release process.</p> <p>Recurring efforts include: - Interoperability development and maintenance to ensure the weapon system is authorized to operate on joint, service, or allied communications networks. - Safety confirmation and verification testing, preparation and approvals of System Safety Risk Assessments, issuance of hazard classifications and safety releases, insensitive munitions approvals and waivers, and independent oversight and support in the areas of reliability, availability, and maintainability (RAM) and quality assurance.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2021 Plans:</p>		1.772 -	2.782 -	1.954 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2020	FY 2021	FY 2022
-SEE ABOVE.				
FY 2022 Plans: -SEE ABOVE.				
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease from FY 2021 to FY 2022 reflects manpower efficiencies.				
Title: THAAD Layered Homeland Defense		0.000	36.500	64.567
		Articles: -	-	-
Description: The THAAD Layered Homeland Defense effort supports the demonstration of weapon system and interceptor improvements to enhance THAAD capabilities against evolving threats. This effort will leverage the existing design improvement activities and develop software and hardware enhancements that demonstrate THAAD capabilities for regional and homeland applications. Demonstrations will be performed both at the component level and a flight test.				
FY 2021 Plans: -Conduct THAAD Launch on Remote/Engage on Remote Analysis and Implementation CONOPS with support for IBCS concept planning and analysis. -Conduct THAAD System definition/systems engineering performance assessment and CONOPs studies. -Conduct THAAD Seeker and Image Processing Software Design Analysis/Performance Analysis. -Conduct THAAD Mission Computer Software Architecture and Performance Analysis Studies. -Conduct THAAD Missile Guidance, Control, and Navigation CONOPS and SW Performance Analysis trade studies of kinematic upgrade options. -Conduct THAAD Capability Gap Analysis and Technology Risk Reduction (TRR) efforts to include: Evaluating all potential THAAD concepts against the MDS Gaps and Needs; Weapon System CONOPS Systems Engineering; and Weapon Systems Architecture Trade Study. -Conduct design analysis to identify government-owned lab upgrades for engagement performance analysis to include scene generation and hardware integration.				
FY 2022 Plans: - Execute Rapid Acquisition efforts to develop and demonstrate THAAD interceptor and weapon system performance enhancements and capabilities needed to meet evolving threat requirements identified in the FY 2021 CONOPS and analysis. Leading component enhancements identified in the FY 2021 plans include: - Software development enabling THAAD to use the redesigned 2 color seeker hardware providing the capability to address evolving threat requirements. - Lightweight Kill Vehicle development enabling significant kinematic performance improvements against maneuvering threats.				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Expanded integration with the MSE interceptor and exploitation of Integrated Air and Missile Defense (IAMMD) Battle Command System (IBCS) performance and CONOPS improvements.			
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> Increase from FY 2021 to FY 2022 provides funding to execute Rapid Acquisition efforts to develop and demonstrate hardware and software enhancements to THAAD interceptor and weapon system capabilities needed to meet requirements of the additional threats identified in the FY 2021 CONOPS and analysis and included in the THAAD program.			
Accomplishments/Planned Programs Subtotals	185.483	259.923	251.192

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

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD07: <i>THAAD O&M</i>	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: MD07: <i>THAAD Procurement</i>	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0603914C: <i>Ballistic Missile Defense Test</i>	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604876C: <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The THAAD program awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for THAAD development. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. The discrete task orders allow management and tracking of development work.

Concept of Operations (CONOPS) development and analysis is on-going to prioritize THAAD enhancements that will support both regional and Layered Homeland Defense capability against validated threats allocated to THAAD. Upon completion of this analysis, THAAD will add tasks as appropriate to the existing ACD contract with Lockheed Martin to develop and demonstrate THAAD interceptor and weapon system performance enhancements and capabilities needed to meet threat requirements.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency												Date: May 2021			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
0400 / 4						PE 0603881C / Ballistic Missile Defense Terminal Defense Segment				MD07 / THAAD					
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Terminal High Altitude Area Defense (THAAD) Development - Advanced Capability Development	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	869.459	54.592	Nov 2019	111.455	Nov 2020	82.417	Nov 2021	-		82.417	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - IT Program Support	C/CPAF	Northrup Grumman : AL, AK, CA, CO, HI, NM, VA	10.331	2.793	Nov 2019	2.889	Nov 2020	2.819	Nov 2021	-		2.819	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - MDA Program Support	MIPR	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	11.248	1.736	Dec 2019	2.470	Dec 2020	0.000		-		0.000	0.000	15.454	0.000
Terminal High Altitude Area Defense (THAAD) Development - Models & Simulations	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	244.671	29.943	Dec 2019	29.607	Dec 2020	30.384	Nov 2021	-		30.384	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Requirements and Design	C/CPAF	Boeing : AL	18.641	2.701	Dec 2019	4.917	Dec 2020	5.797	Dec 2021	-		5.797	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Software IV&V	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	0.000	0.000		4.504	Nov 2020	4.131	Nov 2021	-		4.131	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Software Support (GOVT)	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	14.147	0.000		0.000		0.000		-		0.000	0.000	14.147	0.000
Terminal High Altitude Area Defense (THAAD) Development - THAAD Radar Improvements	SS/CPAF	Raytheon : MA	10.000	0.000		0.000		0.000		-		0.000	0.000	10.000	0.000

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Terminal High Altitude Area Defense (THAAD) Development - Verification and Assessment	C/CPFF	TEAMS SE&I : AL / CO	14.855	1.912	Dec 2019	1.052	Nov 2020	0.669	Nov 2021	-		0.669	Continuing	Continuing	Continuing
JEON - Advanced Capability Development	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	147.789	30.100	Dec 2019	0.000		0.000		-		0.000	0.000	177.889	0.000
JEON - MDA Program Support	Various	MDA : Huntsville, AL	0.509	0.000		0.000		0.000		-		0.000	0.000	0.509	0.000
JEON - OGA JEON Support (GOVT)	MIPR	US Army Tank Automotive Research, Development, and Engineering Center (TARDEC), Army Test and Evaluation Command (ATEC) : Warren, MI / Huntsville, AL	12.959	3.200	Dec 2019	3.200	Dec 2020	0.000		-		0.000	0.000	19.359	0.000
Project Redwood- Details at a Higher Classification - Special Programs	SS/FP	N/A : N/A	95.421	11.930	Nov 2019	10.493	Nov 2020	12.052	Nov 2021	-		12.052	Continuing	Continuing	Continuing
THAAD Layered Homeland Defense - THAAD Layered Homeland Defense	Various	Lockheed Martin / U.S. Army Combat Capabilities Development Command (CCDC) : Sunnyvale, CA / Huntsville, AL	0.000	0.000		36.500	Mar 2021	64.567	Dec 2021	-		64.567	Continuing	Continuing	Continuing
Subtotal			1,450.030	138.907		207.087		202.836		-		202.836	Continuing	Continuing	N/A

Remarks
N/A.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Program Operations - Program Operations	Various	Missile Defense Agency (MDA) : Ft. Belvoir, VA / Huntsville, AL	332.617	44.804	Oct 2019	50.054	Oct 2020	46.402	Oct 2021	-		46.402	Continuing	Continuing	Continuing
THAAD Program Support - Mission Support	MIPR	ATEC / SMDC / CCDC / MDA : WSMR, NM / Huntsville, AL	34.026	1.772	Dec 2019	2.782	Dec 2020	1.954	Dec 2021	-		1.954	Continuing	Continuing	Continuing
THAAD Program Support - Prime Contractor Support	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	0.000
THAAD Program Support - Prior year no longer funded in the FYDP	Various	Various : Various	136.579	0.000		0.000		0.000		-		0.000	0.000	136.579	0.000
Subtotal			503.822	46.576		52.836		48.356		-		48.356	Continuing	Continuing	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			

Remarks
N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,953.852	185.483	259.923	251.192	-	251.192	Continuing	Continuing	N/A

Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency **Date: May 2021**

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>
--	---	---

	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 2020		FY 2021		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026	
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) Critical Design Review	▲													
THAAD Software Build 5.0 - THAAD Updates to Maintain Mission Assurance System Requirement Review (SRR)				△										
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) FQT				△										
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Preliminary Design Review (PDR)				△										
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Critical Design Review (CDR)							△							

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD07 / <i>THAAD</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) Critical Design Review	2	2020	2	2020
THAAD Software Build 5.0 - THAAD Updates to Maintain Mission Assurance System Requirement Review (SRR)	3	2021	3	2021
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) FQT	4	2021	4	2021
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Preliminary Design Review (PDR)	4	2021	4	2021
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Critical Design Review (CDR)	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC07: <i>Cyber Operations</i>	18.761	15.037	9.806	11.977	-	11.977	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

Increase from FY 2021 to FY 2022 provides the improved cybersecurity requirements for software development efforts to align with Missile Defense Agency (MDA) and USD(R&E) priorities. Development efforts involve more robust cybersecurity for both offense and defense to address the advanced threat.

A. Mission Description and Budget Item Justification

Cyber Operations sustain MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities; analysis of validation results, risk assessments; reviews of proposed Program Manager/Information Assurance Manager Plans of Action and Milestones for MDA THAAD mission systems; and supports THAAD certification to operate in the MDS.

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

	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	15.037	9.806	11.977
Articles:	-	-	-
Description: Funding in this project sustains MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, monitoring and tracking of cybersecurity mitigations, and all other activities necessary to comply with the Federal Information Security Management Act (FISMA).			
Recurring efforts include:			
<ul style="list-style-type: none"> - Conduct cybersecurity/information assurance engineering and architecture planning for THAAD information technology systems. - Develop and testing cybersecurity/information assurance control measures for MDS THAAD systems. - Develop THAAD RMF for DoD Information Technology Certification and accreditation packages. - Support CVT of THAAD mission, test, and training systems. - Develop Plan of Action and Milestones (POA&Ms) to resource and remediate information assurance deficiencies. - Conduct annual information assurance reviews on the THAAD enclaves to assess compliance in implementing and maintaining Information Assurance (IA) controls. - Perform Information Assurance Vulnerability Alert (IAVA) to mitigate potential system vulnerabilities. - Update THAAD software and hardware to ensure compliance with DoD Weapon System Information Assurance Programs. - Continue THAAD Weapon System software development efforts consistent with DoD cybersecurity requirements which were previously covered under THAAD Development, in order to correlate cyber software activities with realigned funding. 			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: FY 2021 Plans: -SEE ABOVE. FY 2022 Plans: -SEE ABOVE. FY 2021 to FY 2022 Increase/Decrease Statement: Increase from FY 2021 to FY 2022 provides the improved cybersecurity requirements for software development efforts to align with Agency and USD(R&E) priorities. Development efforts involve more robust cybersecurity for both offense and defense to address the advanced threat.			
Accomplishments/Planned Programs Subtotals	15.037	9.806	11.977

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD07: <i>THAAD O&M</i>	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: MD07: <i>THAAD Procurement</i>	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0604876C: <i>Ballistic Missile Defense Terminal Defense Segment Test</i>	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The THAAD program awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for THAAD development. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. The discrete task orders allow management and tracking of development work.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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) - CND/IA Advisory and Assistance Services	C/CPFF	Torch Technologies : Various MDA Locations	4.114	1.002	Oct 2019	0.761	Oct 2020	1.114	Oct 2021	-		1.114	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Security Engineering	SS/CPFF	LMSSC : Sunnyvale, CA/Huntsville, AL	14.647	14.035	Dec 2019	9.045	Dec 2020	10.863	Dec 2021	-		10.863	Continuing	Continuing	Continuing
Subtotal			18.761	15.037		9.806		11.977		-		11.977	Continuing	Continuing	N/A

Remarks
N/A.

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.761	15.037	9.806	11.977	-	11.977	Continuing	Continuing	N/A

Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>
--	---	--

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 2020		FY 2021		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026	
MC07 Completed Cyber Operations					◆	◆	◆	◆	◆									
MC07 Planned Cyber Operations									◇	◇	◇	◇	◇	◇				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MC07 / <i>Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC07 Completed Cyber Operations	1	2020	1	2021
MC07 Planned Cyber Operations	2	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency										Date: May 2021		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>				Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD06: <i>Patriot Advanced Capability-3 (PAC-3)</i>	297.424	86.767	26.198	1.226	-	1.226	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

Decrease from FY 2021 to FY 2022 reflects completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

PAC-3 is an operational, land-based weapon built upon the proven U.S. Army Phased Array Tracking Radar Intercept on Target (PATRIOT) air and missile defense infrastructure. The Army is responsible for production and further development of the PAC-3 System and Missile Segment Enhancements (MSE); MDA remains responsible for any MDS interoperability and integration efforts. The Army's Project Manager for Short and Intermediate Effectors for Layered Defense (PM SHIELD) will utilize MDA funds to further the integration of PATRIOT with the MDS.

This project includes PM SHIELD's portion of the JEON including:

- 1) PATRIOT launch on remote to utilize THAAD's capability to detect and track threat ballistic missiles at longer ranges and utilize MSE's full kinematic capability
- 2) THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability

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

	FY 2020	FY 2021	FY 2022
Title: General Support	1.156	1.198	1.226
Articles:	-	-	-
Description: MDA funds PATRIOT participation in MDS interoperability integration efforts. Activities support the day-to-day tasking that is leveraged upon PM SHIELD by MDA based on the Transfer and Transition Plan Annex L.			
FY 2021 Plans: -SEE ABOVE.			
FY 2022 Plans: -SEE ABOVE.			
FY 2021 to FY 2022 Increase/Decrease Statement: N/A.			
Title: JEON - PM SHIELD	85.611	25.000	0.000

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
<p align="right"><i>Articles:</i></p> <p>Description: This accomplishment fully funds PM SHIELD's portion of the JEON including PATRIOT Launch on Remote and THAAD/MSE integration Part 1.</p> <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2021 Plans: - Completes THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability.</p> <p>FY 2022 Plans: - No funding is requested for this effort in FY 2022.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease from FY 2021 to FY 2022 reflects completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).</p>	-	-	-
Accomplishments/Planned Programs Subtotals	86.767	26.198	1.226

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 0208866C: MD07: THAAD O&M	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: MD07: THAAD Procurement	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0604876C: Ballistic Missile Defense Terminal Defense Segment Test	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy
The planned acquisition strategy for PATRIOT support is to provide Military Interdepartmental Purchase Requests (MIPR) to the U.S. Army PM SHIELD to further the integration of PATRIOT with the MDS.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
JEON - PM SHIELD - JEON - PM SHIELD	MIPR	PM SHIELD : Huntsville, AL	287.200	85.611	Dec 2019	25.000	Dec 2020	0.000		-		0.000	0.000	397.811	0.000
Subtotal			287.200	85.611		25.000		0.000		-		0.000	0.000	397.811	N/A

Remarks
N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
General Support - General Support	MIPR	PM SHIELD : Huntsville, AL	10.224	1.156	Nov 2019	1.198	Nov 2020	1.226	Nov 2021	-		1.226	Continuing	Continuing	Continuing
Subtotal			10.224	1.156		1.198		1.226		-		1.226	Continuing	Continuing	N/A

Remarks
N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			

Remarks
N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	297.424	86.767	26.198	1.226	-	1.226	Continuing	Continuing	N/A

Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>
--	---	---

	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 2020		FY 2021		FY 2022		FY 2023		FY 2024		FY 2025		FY 2026	
MD06 Completed Patriot Advanced Capability-3 (PAC-3) General Support	◆	◆	◆	◆	◆									
MD06 Planned Patriot Advanced Capability-3 (PAC-3) General Support					◇	◇	◇	◇	◇	◇				
MD06 JEON - PM SHIELD					△									

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD06 / <i>Patriot Advanced Capability-3 (PAC-3)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD06 Completed Patriot Advanced Capability-3 (PAC-3) General Support	1	2020	1	2021
MD06 Planned Patriot Advanced Capability-3 (PAC-3) General Support	2	2021	4	2022
MD06 JEON - PM SHIELD	2	2021	2	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: <i>Program-Wide Support</i>	103.891	8.025	16.390	13.554	-	13.554	-	-	-	-	-	-
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 2020	FY 2021	FY 2022
Title: Program Wide Support	8.025	16.390	13.554
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 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; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2020	FY 2021	FY 2022
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.				
FY 2021 Plans: - SEE ABOVE.				
FY 2022 Plans: - See ABOVE				
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.				
Accomplishments/Planned Programs Subtotals		8.025	16.390	13.554
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency **Date:** May 2021

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
--	---	--

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : VA	3.500	1.473	Oct 2019	0.000		7.165	Oct 2021	-		7.165	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, NY, VA	0.000	0.000		0.000		0.018	Nov 2021	-		0.018	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	6.989	0.120	Jul 2020	0.000		0.000		-		0.000	0.000	7.109	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	Various : MDA Multi: AL, CO, CA, VA,	14.599	3.401	Oct 2019	0.000		0.700	Oct 2021	-		0.700	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support International and Materiel and Readiness	MIPR	Various : Multi: AL, VA, Aust, Japan	3.492	0.000		0.000		0.000		-		0.000	0.000	3.492	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CO, VA	70.009	3.031	Dec 2019	16.390	Dec 2020	5.666	Oct 2021	-		5.666	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/CPFF	Various : AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		0.005	Nov 2021	-		0.005	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	Various : Multi: AL, VA	1.787	0.000		0.000		0.000		-		0.000	0.000	1.787	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	3.515	0.000		0.000		0.000		-		0.000	0.000	3.515	0.000
Subtotal			103.891	8.025		16.390		13.554		-		13.554	Continuing	Continuing	N/A

Remarks
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency								Date: May 2021					
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>				Project (Number/Name) MD40 / <i>Program-Wide Support</i>						
	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	103.891	8.025		16.390		13.554		-		13.554	Continuing	Continuing	N/A

Remarks
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / <i>Ballistic Missile Defense Terminal Defense Segment</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.