

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency										Date: March 2019		
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 1206893C I Space Tracking and Surveillance System (STSS)							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	35.008	36.955	35.849	-	35.849	35.623	36.334	37.235	37.966	Continuing	Continuing
MD12: Space Tracking and Surveillance System (STSS)	-	32.051	32.217	32.633	-	32.633	33.202	33.793	34.530	35.188	Continuing	Continuing
MC12: Cyber Operations	-	1.424	2.997	1.690	-	1.690	0.750	0.851	0.868	0.916	Continuing	Continuing
MD40: Program-Wide Support	-	1.533	1.741	1.526	-	1.526	1.671	1.690	1.837	1.862	Continuing	Continuing
Program MDAP/MAIS Code: 362												
Note N/A												
A. Mission Description and Budget Item Justification												
<p>The two Space Tracking and Surveillance System (STSS) satellites launched in 2009 provide an on-orbit capability to validate remote sensor fire control integration to inform design and operation of Missile Defense Agency (MDA) space-layer capabilities. MDA uses STSS data to characterize contribution of space data into the Ballistic Missile Defense System (BMDS) and to provide sensor measurements and background data supporting trade studies and analyses for MDA space-layer options for both Homeland and Regional Defense.</p> <p>STSS continues to provide risk reduction for MDA space capabilities, models, algorithms, interface definitions, communications architectures, and performance across threat object acquisition, tracking, complex target signatures, discrimination and multi-mission support. STSS also informs the Ballistic Missile Defense System (BMDS) Concept of Operations, timelines and performance requirements for remote space sensor cuing for ballistic missile engagements, expanding battle space for weapon systems such as Aegis Ballistic Missile Defense (BMD).</p> <p>The STSS program demonstrates the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two STSS satellites are operated from the ground station processing center at the Missile Defense Space Center (MDSC). The STSS satellites demonstrate MDA space-layer capabilities and reduce risk for systems by viewing high-value Targets of Opportunity and participating in BMDS flight tests.</p> <p>Though the STSS satellites are operating beyond their life expectancy, MDA will continue STSS operations for as long as possible due to the continued contributions STSS provides to the BMDS mission.</p> <p>The MDSC provides MDA's only centralized collaboration and integration environment that leverages existing Overhead Persistent Infrared (OPIR) enterprise integration in support of BMDS research and development test, and sensor operations. The MDSC capabilities and infrastructure support flight tests, operational concept and prototype development, technology demonstrations, experiments, and algorithm development within a multi-security, collaborative environment to integrate and exploit</p>												

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Missile Defense Agency	Date: March 2019
---	-------------------------

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 1206893C <i>I Space Tracking and Surveillance System (STSS)</i>
---	--

national space asset data. The MDSC also conducts studies and experiments with MDA assets such as the Spacebased Kill Assessment (SKA), and STSS, as well as other agencies' assets.

B. Program Change Summary (\$ in Millions)	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>
Previous President's Budget	34.907	36.955	37.134	-	37.134
Current President's Budget	35.008	36.955	35.849	-	35.849
Total Adjustments	0.101	0.000	-1.285	-	-1.285
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.787	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.888	0.000	-1.285	-	-1.285

Change Summary Explanation

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MD12: Space Tracking and Surveillance System (STSS)	-	32.051	32.217	32.633	-	32.633	33.202	33.793	34.530	35.188	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Two Space Tracking and Surveillance System (STSS) satellites provide a low earth orbit sensor capability with visible and infrared sensors for integrated testing with other Ballistic Missile Defense System (BMDS) elements. STSS demonstrates space-based capabilities including persistent tracking and integrated BMDS discrimination improvements. These two satellites provide valuable risk reduction for acquisition, tracking, complex scenes, and discrimination functionality to include stereo data fusion, cueing radars over the horizon and over-the-horizon fire control.

The on-orbit sensors collect invaluable background, scene, and target signature data to support MDA space-layer and other weapon sensor development trade studies. STSS activities provide information for integration of space-based missile tracking (midcourse phase); remote sensor and weapons cueing via the Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments. STSS enables early capability assessment to address the Warfighter's need for highly available early missile tracking from space, providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for MDA space-layer capabilities include detecting and acquiring missiles; tracking missiles and their deployed objects; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting missile and intercept event to close the fire-control loop; filtering reports to C2BMC; and providing near real-time object data to external users. STSS support to other mission areas improves definition for Enterprise system approaches.

The Missile Defense Space Center (MDSC) provides capabilities and infrastructure to support space operations, integration and testing with the BMDS. It provides a multi-level security environment for sensor data management and integration across space and terrestrial sensor data activities. MDSC experiments leverage DoD and national security space capabilities. MDSC activities support analyses, demonstration and integration of space sensor capabilities into developmental and operational MDA elements. MDSC enables the development of advanced technology and algorithms including fusion of multiple sensor types (radar, overhead persistent infrared, electro-optical and other emerging sensor technologies). It also supports mission integration of space-based missile tracking, sensor and weapons cueing via C2BMC, features and discrimination, kill and impact point assessments into the BMDS and other non-MDA mission areas, including Space Situational Awareness, technical intelligence, and battle space characterization. This effort is a continuation of work previously performed in program element 0603895C that supported the STSS program.

Lessons learned and data gathered from the STSS demonstration satellites program provide valuable information for MDA space-layer modeling and simulation activities in assessing the capability provided by Overhead Persistent Infrared sensors.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2018	FY 2019	FY 2020
Title: Demonstration Satellites			32.051	32.217	32.633
Articles:			-	-	-
<p>Description: The STSS demonstration satellites collect and deliver critical space and missile characterization data used to design and inform the BMDS and space-layer capabilities. The MDSC facilities and activities are required for safe STSS satellite operations and sustainment.</p> <p>STSS activities include:</p> <ul style="list-style-type: none"> - Perform risk reduction for MDA tracking and surveillance initiatives and OPIR Enterprise integration and demonstrations across OPIR cueing, Joint Tasking Operations, and data utility - Collect data to support joint OPIR mission utility assessments across Space Situational Awareness, Battle Space Awareness, and Technical Intelligence missions to include integration, analyses, and studies to confirm data sharing capabilities - Participate in Integrated Master Test Plan events - Conduct satellite testing to demonstrate critical space capabilities, including: <ul style="list-style-type: none"> -- Ability to support BMDS integrated discrimination efforts -- Ability to support Hit/Kill assessment from space -- Ability to cue BMDS sensors from space -- Ability to provide precision cue to BMDS sensors - Perform satellite functionality testing and calibration as part of the satellite operations - Conduct missile tracking experiments as identified in the test specific sections - Provide Air Force Space Command Space Situational Awareness support <p>MDSC efforts related to STSS include:</p> <ul style="list-style-type: none"> - Analyze space radiation environment and its influence on MDA space system performance - Analyze space based sensor data from STSS and OPIR observations, both individually and combined, to identify phenomenology and techniques to aid tracking and discrimination architectures - Provide data for concept studies and analyses for alternative sensor payload configurations - Sustain MDSC resources for all participant activities, including data, voice, and/or video communications, and support MDA Cyber Security directives - Document requirements and perform tracking, design, implementation, and verification necessary for the MDSC facility - Implement emerging cyber security requirements <p>Specific and/or unique accomplishments to each FY are as follows:</p> <p>FY 2019 Plans:</p>					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)					Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)										FY 2018	FY 2019	FY 2020
- SEE ABOVE												
FY 2020 Plans:												
- SEE ABOVE												
FY 2019 to FY 2020 Increase/Decrease Statement:												
N/A												
Accomplishments/Planned Programs Subtotals										32.051	32.217	32.633
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,153.263	803.359	1,156.506	-	1,156.506	829.451	766.237	834.533	776.671	Continuing	Continuing	
• 0603884C: Ballistic Missile Defense Sensors	290.289	385.375	283.487	-	283.487	296.098	263.681	276.092	351.607	Continuing	Continuing	
• 0603890C: BMD Enabling Programs	533.993	620.831	571.507	-	571.507	603.672	541.667	574.553	553.969	Continuing	Continuing	
• 0603892C: AEGIS BMD	798.395	741.076	727.479	-	727.479	718.949	703.473	505.529	527.720	Continuing	Continuing	
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	449.985	507.817	564.206	-	564.206	534.988	502.581	525.742	535.636	Continuing	Continuing	
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	51.905	58.125	56.161	-	56.161	57.446	58.574	61.144	62.339	Continuing	Continuing	
• 0603914C: Ballistic Missile Defense Test	406.806	515.897	395.924	-	395.924	417.946	335.481	451.723	405.136	Continuing	Continuing	
• 0603915C: Ballistic Missile Defense Targets	512.838	561.352	554.171	-	554.171	513.964	439.826	358.018	276.108	Continuing	Continuing	
• 1206895C: Ballistic Missile Defense System Space Programs	45.123	94.484	27.565	-	27.565	21.236	20.483	20.872	21.497	Continuing	Continuing	
Remarks												

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>
<p><u>D. Acquisition Strategy</u></p> <p>The STSS demonstration satellites program follows MDAs capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS) with the subcontractor Raytheon providing the sensor payload. This contract implements MDA's capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the BMDS.</p> <p>MDSC efforts will be acquired on the Specialized Warfighter Development Contract vehicle. This contract is responsible for integrating Research, Development, Test and Evaluation, operations support, resource and infrastructure management for the MDSC.</p> <p><u>E. Performance Metrics</u></p> <p>N/A</p>		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Demonstration Satellites - Capability Based R&D	SS/CPAF	NGAS : Redondo Beach, CA, Schriever AFB, CO	0.000	21.306	Nov 2017	20.279	Nov 2018	20.544	Nov 2019	-		20.544	Continuing	Continuing	Continuing
Demonstration Satellites - STSS Support to Missile Defense Space Center (MDSC)	C/CPFF	Northrop Grumman : Schriever AFB, CO	0.000	3.467	Nov 2017	3.733	Nov 2018	4.087	Nov 2019	-		4.087	Continuing	Continuing	Continuing
Demonstration Satellites - Systems Engineering	FFRDC	Aerospace : Los Angeles, CA	0.000	0.501	Nov 2017	0.284	Nov 2018	0.573	Nov 2019	-		0.573	Continuing	Continuing	Continuing
Subtotal			0.000	25.274		24.296		25.204		-		25.204	Continuing	Continuing	N/A
Remarks															
All efforts listed above are a continuation of PE 0603893C, MD12															
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Demonstration Satellites - Contract Support Services (CSS)	C/Various	MDA : AL, CO	0.000	2.881	Nov 2017	3.361	Nov 2018	2.687	Nov 2019	-		2.687	Continuing	Continuing	Continuing
Demonstration Satellites - IT User Services	C/CPAF	Northrop Grumman/ Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	0.000	0.590	Dec 2017	0.628	Dec 2018	0.646	Dec 2019	-		0.646	Continuing	Continuing	Continuing
Demonstration Satellites - MDA Civilian	Allot	MDA : AL, CO	0.000	2.181	Oct 2017	3.108	Oct 2018	3.131	Oct 2019	-		3.131	Continuing	Continuing	Continuing
Demonstration Satellites - Other Government Agency (OGA) Civilian	MIPR	SMC : Schriever AFB, CO	0.000	0.161	Nov 2017	0.164	Nov 2018	0.167	Nov 2019	-		0.167	Continuing	Continuing	Continuing
Demonstration Satellites - Program Mission Support	Various	Various : Various	0.000	0.556	Nov 2017	0.232	Nov 2018	0.358	Nov 2019	-		0.358	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>						Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Demonstration Satellites - UARC	C/CPFF	Utah University, Space Dynamics Laboratory : AL, AK, CA, CO, HI, MA, UT, VA	0.000	0.408	Nov 2017	0.428	Nov 2018	0.440	Nov 2019	-		0.440	Continuing	Continuing	Continuing
Subtotal			0.000	6.777		7.921		7.429		-		7.429	Continuing	Continuing	N/A
Remarks All efforts listed above are a continuation of PE 0603893C, MD12															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	32.051		32.217		32.633		-		32.633	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 2020 Missile Defense Agency														Date: March 2019																							
Appropriation/Budget Activity										R-1 Program Element (Number/Name)										Project (Number/Name)																	
0400 / 4										PE 1206893C / Space Tracking and Surveillance System (STSS)										MD12 / Space Tracking and Surveillance System (STSS)																	
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 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018										▲																											
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018										◆	◆	◆	◆																								
MIS Operations - 1Q2018-4Q2018										◆	◆	◆	◆																								
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018										◆	◆	◆	◆																								
MDSC TIL Operations - 1Q2018-4Q2018										◆	◆	◆	◆																								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018											▲																										
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018												▲																									
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018													▲																								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019														△																							
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019														◇	◇	◇	◇																				
MIS Operations - 1Q2019-4Q2019														◇	◇	◇	◇																				
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019														◇	◇	◇	◇																				
MDSC TIL Operations - 1Q2019-4Q2019														◇	◇	◇	◇																				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019															△																						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019																△																					
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019																	△																				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020																		△																			
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020																		◇	◇	◇	◇																
MIS Operations - 1Q2020-4Q2020																		◇	◇	◇	◇																
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020																		◇	◇	◇	◇																
MDSC TIL Operations - 1Q2020-4Q2020																		◇	◇	◇	◇																
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020																			△																		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020																				△																	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020																					△																

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency																Date: March 2019							
Appropriation/Budget Activity 0400 / 4								R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)								Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)							
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021														△									
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
MIS Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021														◇	◇	◇	◇						
MDSC TIL Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021														△									
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021															△								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021																△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022																△							
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
MIS Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
Mission Planning, Tasking and Analysis - 1Q2022-4Q2022																◇	◇	◇	◇				
MDSC TIL Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2022																△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2022																	△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2022																	△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2023																		△					
MDSC TIL Operations - 1Q2023-4Q2023																		◇					
Mission Planning, Tasking and Analysis - 1Q2023-4Q2023																		◇					
STSS Demonstration Satellites On-Orbit Operations - 1Q2023-4Q2023																		◇	◇	◇	◇		
MIS Operations - 1Q2023-4Q2023																		◇	◇	◇	◇		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2023																			△				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2023																			△				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2023																				△			

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Missile Defense Agency														Date: March 2019															
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)										Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)									
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024							
MDSC TIL Operations - 1Q2024-4Q2024																					◇								
Mission Planning, Tasking and Analysis - 1Q2024-4Q2024																					◇								
STSS Demonstration Satellites On-Orbit Operations - 1Q2024-4Q2024																					◇	◇	◇	◇					
MIS Operations - 1Q2024-4Q2024																					◇	◇	◇	◇					
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2024																					△								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2024																						△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2024																							△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2024																								△					

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018	1	2018	1	2018
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018	1	2018	4	2018
MIS Operations - 1Q2018-4Q2018	1	2018	4	2018
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018	1	2018	4	2018
MDSC TIL Operations - 1Q2018-4Q2018	1	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018	2	2018	2	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018	3	2018	3	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018	4	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019	1	2019	1	2019
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019	1	2019	4	2019
MIS Operations - 1Q2019-4Q2019	1	2019	4	2019
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019	1	2019	4	2019
MDSC TIL Operations - 1Q2019-4Q2019	1	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019	2	2019	2	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019	3	2019	3	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020	1	2020	1	2020
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020	1	2020	4	2020
MIS Operations - 1Q2020-4Q2020	1	2020	4	2020
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020	1	2020	4	2020
MDSC TIL Operations - 1Q2020-4Q2020	1	2020	4	2020
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020	2	2020	2	2020

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency				Date: March 2019	
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>		Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>	
		Start		End	
Events	Quarter	Year	Quarter	Year	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020	3	2020	3	2020	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020	4	2020	4	2020	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021	1	2021	1	2021	
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021	1	2021	4	2021	
MIS Operations - 1Q2021-4Q2021	1	2021	4	2021	
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021	1	2021	4	2021	
MDSC TIL Operations - 1Q2021-4Q2021	1	2021	4	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021	2	2021	2	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021	3	2021	3	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021	4	2021	4	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022	1	2022	1	2022	
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022	1	2022	4	2022	
MIS Operations - 1Q2022-4Q2022	1	2022	4	2022	
Mission Planning, Tasking and Analysis - 1Q2022-4Q2022	1	2022	4	2022	
MDSC TIL Operations - 1Q2022-4Q2022	1	2022	4	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2022	2	2022	2	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2022	3	2022	3	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2022	4	2022	4	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2023	1	2023	1	2023	
MDSC TIL Operations - 1Q2023-4Q2023	1	2023	1	2023	
Mission Planning, Tasking and Analysis - 1Q2023-4Q2023	1	2023	1	2023	
STSS Demonstration Satellites On-Orbit Operations - 1Q2023-4Q2023	1	2023	4	2023	
MIS Operations - 1Q2023-4Q2023	1	2023	4	2023	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2023	2	2023	2	2023	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2023	3	2023	3	2023	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)		Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)	
	Start		End	
Events	Quarter	Year	Quarter	Year
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2023	4	2023	4	2023
MDSC TIL Operations - 1Q2024-4Q2024	1	2024	1	2024
Mission Planning, Tasking and Analysis - 1Q2024-4Q2024	1	2024	1	2024
STSS Demonstration Satellites On-Orbit Operations - 1Q2024-4Q2024	1	2024	4	2024
MIS Operations - 1Q2024-4Q2024	1	2024	4	2024
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2024	1	2024	1	2024
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2024	2	2024	2	2024
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2024	3	2024	3	2024
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2024	4	2024	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MC12 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MC12: Cyber Operations	-	1.424	2.997	1.690	-	1.690	0.750	0.851	0.868	0.916	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Decrease from FY 2019 to FY 2020 reflects completion of hardware replacement and executing steady-state support to meet cyber security requirements.												
A. Mission Description and Budget Item Justification Space Tracking and Surveillance System (STSS) 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) Plans of Action and Milestones (POA&Ms) for MDA STSS mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2018	FY 2019	FY 2020	
Title: Network/System Certification and Accreditation (C&A) Articles: Description: This activity maintains the Assessment and Authorization (A&A) and C&A data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and 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) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of MDA mission, test, and administrative systems. Recurring accomplishments include the following: - Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms - Conduct cybersecurity design, engineering, and architecture planning for STSS information technology systems - Plan and test the cybersecurity controls for STSS and MDSC systems - Conduct SCA testing continuous monitoring of STSS and MDSC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities Specific and/or unique accomplishments to each FY are as follows: FY 2019 Plans:									1.424	2.997	1.690	
									-	-	-	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
- Initiates STSS system hardware replacement for cyber security requirements compliance FY 2020 Plans: - Completes STSS system hardware replacement for cyber security requirements compliance and executes steady-state support to meet cyber security requirements FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 reflects completion of hardware replacement and executing steady-state support to meet cyber security requirements.			
Accomplishments/Planned Programs Subtotals		1.424	2.997
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MC12 / Cyber Operations					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Network/System Certification and Accreditation (C&A) - Civ Cyber Labor	Allot	MDA : Various	0.000	0.176	Oct 2017	0.179	Oct 2018	0.180	Oct 2019	-		0.180	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Contractor Support	C/Various	MDA : AL, CO	0.000	0.352	Nov 2017	0.218	Nov 2018	0.571	Nov 2019	-		0.571	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	NGAS : Schriever AFB, CO/Redondo Beach, CA	0.000	0.896	Nov 2017	2.600	Nov 2018	0.939	Nov 2019	-		0.939	Continuing	Continuing	Continuing
Subtotal			0.000	1.424		2.997		1.690		-		1.690	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	1.424		2.997		1.690		-		1.690	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 2020 Missile Defense Agency														Date: March 2019															
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)										Project (Number/Name) MC12 / Cyber Operations									
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024							
MC12 Cyber Operations										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇				

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC12 Cyber Operations	1	2018	4	2024

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MD40: Program-Wide Support	-	1.533	1.741	1.526	-	1.526	1.671	1.690	1.837	1.862	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Program Wide Support (PWS) is allocated 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.												
A. Mission Description and Budget Item Justification PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians and Contract Support Services. This provides integrity and oversight of the BMDS 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. 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; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; 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 2018	FY 2019	FY 2020	
Title: Program Wide Support Articles: Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians and Contract Support Services. This provides integrity and oversight of the BMDS 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. 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; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; 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 2019 Plans:									1.533	1.741	1.526	
									-	-	-	

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Missile Defense Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019
N/A			
FY 2020 Plans: N/A			
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease from FY 2019 to FY 2020 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		1.533	1.741
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			
E. Performance Metrics N/A			

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Missile Defense Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD40 / Program-Wide Support					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Operations and Support Services	C/CPAF	Northrop Grumman : CO	0.000	1.260	Jan 2018	1.332	Aug 2019	1.503	Jul 2020	-		1.503	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various Multi: AL, CA, CO, : VA	0.000	0.054	Jul 2018	0.409	Jul 2019	0.023	Jul 2020	-		0.023	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Support Services	Reqn	Various Multi: AK, AL, CA : CO, HI, VA	0.000	0.219		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	1.533		1.741		1.526		-		1.526	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	1.533		1.741		1.526		-		1.526	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 2020 Missile Defense Agency														Date: March 2019																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)										Project (Number/Name) MD40 / Program-Wide Support																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023		FY 2024																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
MD40 Program-Wide Support										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Missile Defense Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2018	4	2024