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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206446SF I Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	786.340	1,266.437	1,730.821	0.000	1,730.821	1,887.813	2,553.739	2,066.041	2,788.691	Continuing	Continuing
657LEO: Resilient MW/MT - LEO	-	786.340	1,266.437	1,730.821	0.000	1,730.821	1,887.813	2,553.739	2,066.041	2,788.691	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including advanced missile tracking and global surveillance enabling beyond-line-of-sight targeting. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver Missile Warning, Missile Tracking and Missile Defense (MW/MT/MD) and Fire Control capabilities to U.S. joint warfighting forces in bi-annual tranches, which began in FY 2022.

This program element may include necessary civilian pay expenses and contractor support required to support delivery of the MW/MT/MD capability.

The total cost of the Tranche 1 (T1) Tracking Layer Middle Tier of Acquisition effort is \$2,745.400 million, including RDT&E and procurement of prototype units. The T1 Tracking Layer RP program is fully funded across the Future Years Defense Program.

The total cost of the Tranche 2 (T2) Tracking Layer Middle Tier of Acquisition effort is \$3,760.600 million, including RDT&E and procurement of prototype units. The T2 Tracking Layer RP program is fully funded across the Future Years Defense Program.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	786.340	1,266.437	1,004.406	0.000	1,004.406
Current President's Budget	786.340	1,266.437	1,730.821	0.000	1,730.821
Total Adjustments	0.000	0.000	726.415	0.000	726.415
• 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	0.000	0.000			
• Other Adjustments	0.000	0.000	726.415	0.000	726.415

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 657LEO: Resilient MW/MT - LEO

Congressional Add: INDOPACOM Missile Tracking Demonstration Expansion

Congressional Add: Tranche 1 Space Resiliency Payloads

Congressional Add Subtotals for Project: 657LEO

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	250.000	-
	22.500	-
	272.500	-
	272.500	-

Change Summary Explanation

The increase in FY 2025 from the Previous President's Budget to the Current President's Budget incorporates funding previously programmed under Appropriation 3620, PE 1206448SF and Appropriation 3022, PE 1206446SF.

The increase between the FY 2024 amount and the FY 2025 amount reflects significant increase in Tranche 2 activities for space vehicle development, delivery, and test.

C. Accomplishments/Planned Programs (\$ in Millions)

Title:	FY 2023	FY 2024	FY 2025
Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)	513.840	1,266.437	1,730.821
Description: Rapidly develop, deploy and demonstrate prototype architecture that enables resilient Missile Warning/Missile Tracking/Missile Defense enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will define, demonstrate, and			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>deliver the architectures and standards necessary to fully populate a Missile Warning/Missile Tracking/Missile Defense LEO layer as part of the PWSA.</p> <p><i>FY 2024 Plans:</i></p> <p>Tranche 1</p> <ul style="list-style-type: none"> - Complete Optical Interoperability Testing (OIT) with Tranche 1 Transport Layer Space Vehicles (SVs) to ensure optical connectivity. - Complete payload proto-qual Assembly, Integration and Testing (AI&T). - Complete space bus proto-qual AI&T. - Produce payloads and space buses and conduct qualification testing. - Integrate payloads and buses and begin final SV system AI&T. - Complete development of space vehicle command, control and telemetry hardware and software systems, test with O&I ground system, and integrate workstations into the PWSA Operations Centers - Continue MW/MT/MD enterprise data integration with networks and fusion applications. - Complete space vehicle FlatSat development and begin operations testing through connections with the operations and integration (O&I) ground segment. - Complete Tracking SV component deliveries and begin vehicle assembly and integration. - Perform Tracking payload ground calibration and begin SV environmental test campaigns. - Continue Fire Control prototype build. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 2</p> <ul style="list-style-type: none"> - Execute Tranche 2 acquisition and source selection processes leading to space vehicle vendor procurement instruments. - Award Tranche 2 Tracking Layer to up to three space vehicle vendors. - Execute Tranche 2 Tracking Layer kick-offs. - Complete Tranche 2 Tracking Layer System Requirements Reviews (SRRs). - Begin Early Integration Studies to support launch. - Begin Tranche 2 Tracking Layer MW/MT/MD enterprise data integration with networks and fusion applications. 			

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C. Accomplishments/Planned Programs (\$ in Millions)

- Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community.
- Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.

Proliferated Warfighter Space Architecture (PWSA) Future Programs (PFP)

- Execute Fire-control On Orbit-support-to-the-war Fighter (FOO Fighter), for advanced missile fire control, acquisition and source selection processes leading to space vehicle vendor procurement instruments.
- Award FOO Fighter to space vehicle vendor.
- Execute FOO Fighter award kick-off.
- Complete FOO Fighter initial design through Preliminary Design Review (PDR).
- Complete FOO Fighter System Requirements Reviews (SRR).
- Execute other advanced fire control efforts including Warlock and Strauss.
- Construct ground segment network including a Demonstration Operations Center (DOC).
- Initiate PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES).

FY 2025 Plans:

Tranche 1

- Complete payload and space bus production and conduct qualification testing.
- Integrate payloads and buses and complete final space vehicle system Assembly, Integration and Testing (AI&T).
- Support Ground Readiness Review (GRR) to ensure integration with PWSA Operations Centers
- Complete initial integration with Missile Warning/Missile Tracking/Missile Defense (MW/MT/MD) enterprise data interfaces and fusion applications.
- Continue space vehicle FlatSat operations testing with the operations and integration (O&I) ground segment.
- Perform Tracking payload ground calibration and complete space vehicle environmental test campaigns.
- Complete Fire Control prototype build.
- Ship space vehicles to launch site and integrate onto the multi-vehicle launch dispensers.
- Conduct readiness for launch and early orbit phase operations and transition to nominal operations.

FY 2023	FY 2024	FY 2025

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Begin conducting on-orbit test and checkout, orbital positioning, and transition operations to the operations centers for each plane of space vehicles. - Begin system level Developmental Testing - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 2</p> <ul style="list-style-type: none"> - Complete T2 Tracking Layer Preliminary Design Reviews (PDRs) and Critical Design Reviews (CDRs). - Begin Optical Interoperability Testing (OIT) with Tranche 2 Transport Layer (T2TL) space vehicles to ensure optical connectivity. - Begin payload proto-qual AI&T. - Begin space bus proto-qual AI&T. - Initiate production of payloads and space buses and conduct qualification testing. - Support ground activities to ensure integration with PWSA Operations Centers - Continue MW/MT/MD enterprise data integration with networks and fusion applications. - Begin space vehicle FlatSat development and begin operations testing. - Initiate Tracking space vehicle component deliveries and vehicle assembly and integration. - Planning for Tracking payload ground calibration and begin space vehicle environmental test campaigns. - Begin T2TL Gamma efforts to include support for advanced tactical links and Fire Control. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 3</p> <ul style="list-style-type: none"> - Initiate design requirements for the Tranche 3 Tracking Layer space vehicles as informed by the MW/MT/MD and Fire Control force design analysis. 				

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Begin drafting acquisition plan and solicitation for Tranche 3 Tracking Layer. - Coordinate Warfighter Working Group advocacy and feedback on Tranche 3 Tracking Layer acquisition and MW/MT/MD enterprise integration plans. - Coordinate Tranche 3 Tracking Layer performance requirements with the warfighter community. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>PWSA Future Programs (PFP)</p> <ul style="list-style-type: none"> - FOO Fighter: Vehicle build and initial assembly and test. - Complete facility and network design for the DOC to support demonstrations. - Continue PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). - Execute other advanced fire control efforts including Warlock and Strauss. <p>FY 2024 to FY 2025 Increase/Decrease Statement: The increase between the FY 2024 amount and the FY 2025 amount reflects significant increase in Tranche 2 activities for space vehicle development, delivery, and test.</p>			
Accomplishments/Planned Programs Subtotals	513.840	1,266.437	1,730.821

	FY 2023	FY 2024
Congressional Add: INDOPACOM Missile Tracking Demonstration Expansion	250.000	-
FY 2023 Accomplishments: Began development of additional plane of Missile Warning/Missile Tracking Vehicles (SVs) in the PWSA Tranche 1 Tracking Layer (T1TL) to increase global Missile Warning and Missile Tracking coverage in support of combatant commands to include INDOPACOM. This effort completed program kickoff, Systems Requirements Review, and Preliminary Design Review.		
Congressional Add: Tranche 1 Space Resiliency Payloads	22.500	-

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	FY 2023	FY 2024
FY 2023 Accomplishments: Hosted auxiliary resiliency payload on T1TL spacecraft to demonstrate threat detection capability in Low Earth Orbit (LEO). This augments current spacecraft resiliency by detecting directed energy threats and passing data to ground for further processing and characterization. This effort completed program kickoff through critical design review.		
Congressional Adds Subtotals	272.500	-

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

N/A

Remarks

E. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers. SDA's Tranche 1 Tracking Layer and Tranche 2 Tracking Layer space systems are being acquired via Firm Fixed Price contracts conducted in accordance with Other Transaction Authority (OT) for prototyping processes.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	Project (Number/Name) 657LEO / <i>Resilient MW/MT - LEO</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
Tranche 1 Tracking Layer	Various	Various : Various	-	510.631	Sep 2023	275.132	Nov 2023	376.990	Nov 2024	-		376.990	Continuing	Continuing	-
Tranche 2 Tracking Layer	Various	Various : Various	-	0.000		766.877	Jan 2024	1,067.156	Nov 2024	-		1,067.156	Continuing	Continuing	-
PWSA Future Programs - Fire Control (Foo Fighter, Warlock)	Various	Various : Various	-	0.000	Sep 2023	221.136	Mar 2024	278.050	Nov 2024	-		278.050	Continuing	Continuing	-
INDOPACOM Missile Tracking Demonstration Expansion (Congressional Add)	Various	Various : Various	-	250.000	Feb 2023	0.000		0.000		-		0.000	Continuing	Continuing	-
Tranche 1 Space Resiliency Payloads (Congressional Add)	Various	Various : Various	-	22.500	Apr 2023	0.000		0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	783.131		1,263.145		1,722.196		-		1,722.196	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
FFRDC Support	RO	Aerospace Corp. : El Segundo, CA	-	3.209	Jan 2023	3.292	Mar 2024	8.625	Dec 2024	-		8.625	Continuing	Continuing	-
Subtotal			-	3.209		3.292		8.625		-		8.625	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	786.340	1,266.437	1,730.821	-		1,730.821	Continuing	Continuing	N/A

Remarks
The worked performed in this PE continues efforts that were previously funded in FY 2022 under RDT&E, Defense-Wide, PE 1206410SDA.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	
Develop, test, and deliver Tranche 1 Tracking Satellites	[REDACTED]
Develop, test, and deliver Tranche 2 Tracking Satellites	[REDACTED]
Ground integration activities	[REDACTED]
<i>INDOPACOM Missile Tracking Demonstration Expansion</i>	
Develop, test, and deliver additional Tranche 1 Tracking WFOV Satellites	[REDACTED]
<i>Tranche 1 Space Resiliency Payloads</i>	
Integrate, test, and deliver hosted payloads on Tranche 1 Tracking WFOV Satellites	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>				
Develop, test, and deliver Tranche 1 Tracking Satellites	1	2023	3	2026
Develop, test, and deliver Tranche 2 Tracking Satellites	2	2024	4	2026
Ground integration activities	1	2023	4	2026
<i>INDOPACOM Missile Tracking Demonstration Expansion</i>				
Develop, test, and deliver additional Tranche 1 Tracking WFOV Satellites	3	2023	4	2026
<i>Tranche 1 Space Resiliency Payloads</i>				
Integrate, test, and deliver hosted payloads on Tranche 1 Tracking WFOV Satellites	3	2023	2	2025