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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	40.731	57.478	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.209
65A037: <i>Ground Based Optical Sensor</i>	-	40.731	57.478	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.209
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note
 In FY 2024, PE 1203940SF, Space Situation Awareness Operations, Project 65A037, Ground Based Optical Sensor efforts were transferred to PE 1264250SF, Space Situation Awareness Systems, Project 65A037, Ground Based Optical Sensor in order to align it with other developmental Space Domain Awareness (SDA) programs.

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element fields, upgrades, operationalizes, operates and maintains Space Force sensors and information integration capabilities within the SDA network while companion program element 1206425SF, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Activities funded in this program element (1203940SF) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

The Ground-Based Optical Sensor System (GBOSS) Program is an upgrade to the Ground-based Electro-Optical Deep Space Surveillance (GEODSS) system that enables GEODSS to monitor small, closely-spaced, and advanced threats in low, mid, high, and geostationary orbits. The upgraded system will discover currently undetectable space threats, reduce an adversary's tactical surprise and deliver the data required to support accurate, timely, actionable SDA. This facilitates decision-making within the compressed timelines dictated by the realities of the congested, contested, competitive space domain. The program delivers a combination of performance upgrades to existing GEODSS sites, including advanced data exploitation and rapid data dissemination, and will incorporate coalition data, commercial data and/or new GEODSS sites to provide a global capability to positively ID an adversary committing an orbital attack. The program includes updates to the GEODSS image processing and optical subsystems that will enhance the sensitivity and search rate, and fields new multi-spectral advanced technology sensors supporting extended operations, high-fidelity characterization, enhanced indications and warnings (I&W), and attribution.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships,

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and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or re-purpose existing capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver GBOSS capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

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.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	42.008	49.628	21.972	0.000	21.972
Current President's Budget	40.731	57.478	0.000	0.000	0.000
Total Adjustments	-1.277	7.850	-21.972	0.000	-21.972
• Congressional General Reductions	0.000	-0.150			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	8.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.277	0.000			
• Other Adjustments	0.000	0.000	-21.972	0.000	-21.972

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

Project: 65A037: *Ground Based Optical Sensor*

Congressional Add: *Artificial Intelligence and Autonomy for Data Analytics and Sensor Systems*

Congressional Add Subtotals for Project: 65A037

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	-	8.000
	-	8.000
	-	8.000

Change Summary Explanation

FY 2024: -0.144M to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity.

FY 2024: -21.828M transfer of funding to PE 1206425SF, Space Situation Awareness Systems in order to align it with other developmental SDA programs.

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: Ground Based Optical Sensor System (GBOSS)</p> <p>Description: GBOSS provides a global, ground-based, optical sensor capability for Space Domain Awareness (SDA). The program implements advanced capabilities that may leverage coalition data, commercial data, and sophisticated exploitation algorithms to enhance system response and resiliency to operate in the contested space domain based on aggressive threats by our pacing-competitors, China and Russia. GBOSS improves sensitivity, search rate, tracking of non-cooperative launches, precise tagging of clustered objects, detection of closely spaced dim objects, attribution of orbital attackers and delivers foundational technology to support data exploitation for advanced indications and warnings. This effort includes upgrading existing sensors, dissemination of all data to DoD and IC stakeholders via the Unified Data Library (UDL), and may field GBOSS-enhanced GEODSS capabilities to new locations in accordance with USSF Leadership direction. The program will also acquire new advanced technology sensors to improve persistence and advanced multi-spectral data collection, enabling high-fidelity characterization and rapid attribution. The program will collaborate with Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and National Air and Space Intelligence Center (NASIC) efforts to ensure enterprise data fusion and dissemination supporting Enterprise Space Battle Management Command, and Control (ESBMC2).</p> <p>FY 2023 Plans: Complete the installation and testing of the GET upgrade at the Maui GEODSS site. Incorporate coalition data, commercial data, and/or initiate facility construction of a European GEODSS site to close the Atlantic Optical Gap and support Initial Operational Capability (IOC) in FY 2024. Incorporate coalition data, commercial data and/or initiate facility construction of an Indo-Pacific GEODSS site to provide full global coverage by FY 2026 and Full Operational Capability (FOC) in FY 2027.</p> <p>FY 2023 funding will allow the program office to continue developing and fielding a resilient system necessary to operate in the contested space domain. Activities may include, but are not limited to: integration and test of command and control (C2) and mission partner interfaces, implementation of advanced data exploitation algorithms that may include pattern of life (PoL), advanced indications and warnings (I&W), enhanced defensive cyber operations resiliency measures, space test/combat range events, studies, technical analysis, risk reduction experiments, prototyping and program office support, etc.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decreased due to transfer of GBOSS to PE 1206425SF, Space Situation Awareness Systems.</p>	40.731	49.478	0.000
Accomplishments/Planned Programs Subtotals	40.731	49.478	0.000

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	FY 2022	FY 2023
Congressional Add: Artificial Intelligence and Autonomy for Data Analytics and Sensor Systems	-	8.000
FY 2023 Plans: This effort will develop and demonstrate a prototype of a distributed Artificial Intelligence-driven autonomous SDA sensor management system and associated modular hosting system.		
Congressional Adds Subtotals	-	8.000

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

N/A

Remarks

E. Acquisition Strategy

This program began in FY 2018 to address ground-based optical SDA gaps and shortfalls. The acquisition strategy, approved in March 2018, accelerates the development and fielding of the solution, minimizing the time to address the requirements in light of current and emerging threats. Initial TMRR activities were executed using existing defense, intelligence, and lab contracts. EMD activities are being executed on the Maintenance of Space Situational Awareness Integrated Capabilities (MOSSAIC) contract awarded through full and open competition.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
GBOSS design, development and life extension	Various	L3Harris : Colorado Springs, CO	-	32.492	Nov 2021	33.123	Nov 2022	0.000		-		0.000	0.000	65.615	-
GBOSS Test and Training, Materials Development	C/CPIF	Various : Various	-	-		7.029	Nov 2022	0.000		-		0.000	0.000	7.029	-
GBOSS Technical Mission Analysis	RO	Various : Various	-	2.819	Nov 2021	4.401	Nov 2022	0.000		-		0.000	0.000	7.220	-
GBOSS AI and Autonomy for Data Analytics and Sensor Systems	Various	Various : Various	-	-		8.000	Apr 2023	-		-		-	0.000	8.000	-
Subtotal			-	35.311		52.553		0.000		-		0.000	0.000	87.864	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
A&AS	Various	Various : Various	-	2.560	Nov 2021	2.800	Nov 2022	0.000		0.000		0.000	0.000	5.360	-
FFRDC	Various	Various : Various	-	2.080	Nov 2021	2.000	Nov 2022	0.000		0.000		0.000	0.000	4.080	-
Other Support	C/CPAF	Various : Various	-	0.780	Nov 2021	0.125	Nov 2022	0.000		0.000		0.000	0.000	0.905	-
Subtotal			-	5.420		4.925		0.000		0.000		0.000	0.000	10.345	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	40.731	57.478	0.000	0.000	0.000	0.000	98.209	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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>GBOSS EMD</i>																												
GBOSS EMD	[REDACTED]																											
CDR	[REDACTED]																											
AI & Autonomy																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GBOSS EMD				
GBOSS EMD	1	2022	4	2023
CDR	1	2022	1	2022
AI & Autonomy	3	2023	4	2023