Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1203940SF *I Space Situation Awareness Operations*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	35.749	42.008	49.628	0.000	49.628	21.972	37.833	12.373	12.614	0.000	212.177
65A037: *Ground Based Optical Sensor*	-	35.749	42.008	49.628	0.000	49.628	21.972	37.833	12.373	12.614	0.000	212.177
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 un-detectable 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, 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.

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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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	36.897	56.279	0.000	0.000	0.000
Current President's Budget	35.749	42.008	49.628	0.000	49.628
Total Adjustments	-1.148	-14.271	49.628	0.000	49.628
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-14.271			
• 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	-1.148	0.000			
• Other Adjustments	0.000	0.000	49.628	0.000	49.628

Change Summary Explanation

FY 2021: -$1.148M decrease for SBIR.

FY 2022: -$14.271M Congressional Directed Reduction

FY 2023: The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Ground Based Optical Sensor System (GBOSS)	35.749	42.008	49.628
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-			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
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). ***FY 2022 Plans:*** Complete the software and hardware development for the GEODSS Enhanced Telescope (GET) upgrade and install and test it at the White Sands Missile Range (WSMR) GEODSS site. Install GET hardware and software at the Maui GEODSS site and begin testing. Upgrade infrastructure and start facility build of European site to close the Atlantic Optical Gap to support Initial Operational Capability (IOC) in FY 2024. Begin infrastructure upgrades and facility build of Indo-Pacific site to provide full global coverage by FY 2026. Additionally, FY 2022 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control ***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. 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased because the program's management services requirements decrease following completion of international agreements.			
Accomplishments/Planned Programs Subtotals	35.749	42.008	49.628

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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. The approved acquisition strategy supports fielding Initial Operational Capability (IOC) in the European theater in FY 2024 and Full Operational Capability (FOC) of the global capability in FY 2027.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS design, development and life extension	Various	L3Harris : Colorado Springs, CO	-	24.417	Mar 2021	33.769	Nov 2021	33.273	Nov 2022	-		33.273	Continuing	Continuing	-
Test, Training, Other	C/CPIF	Various : Various	-	-		-		7.029	Nov 2022	-		7.029	Continuing	Continuing	-
GBOSS Technical Mission Analysis	RO	Various : Various	-	6.019	Nov 2020	2.819	Nov 2021	4.401	Nov 2022	-		4.401	Continuing	Continuing	-
		Subtotal	-	30.436		36.588		44.703		-		44.703	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	-	2.567	May 2021	2.560	Nov 2021	2.800	Nov 2022	-		2.800	Continuing	Continuing	-
FFRDC	Various	Various : Various	-	2.696	Apr 2021	2.080	Nov 2021	2.000	Nov 2022	-		2.000	Continuing	Continuing	-
Other Support	C/CPAF	Various : Various	-	0.050	Nov 2020	0.780	Nov 2021	0.125	Nov 2022	-		0.125	Continuing	Continuing	-
		Subtotal	-	5.313		5.420		4.925		-		4.925	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	35.749		42.008		49.628		-		49.628	Continuing	Continuing	N/A

Remarks

The GBOSS program has minimal organic resources. The FY 2023 funding in Management Services enables parallel efforts to implement international agreements in two countries, manage site construction contracts, and simultaneously maintain surveillance and management of the telescope development in the U.S. Additionally, specialized FFRDC knowledge and expertise in optics will support the enhanced telescope upgrade effort.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor*

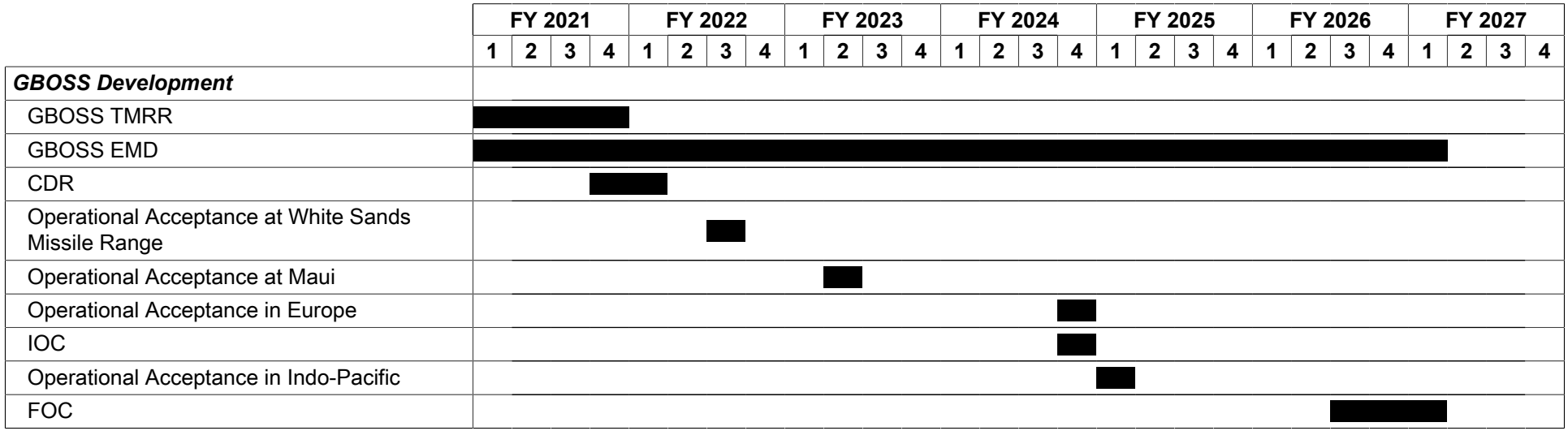

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awarenes s Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GBOSS Development				
GBOSS TMRR	1	2021	4	2021
GBOSS EMD	1	2021	1	2027
CDR	4	2021	1	2022
Operational Acceptance at White Sands Missile Range	3	2022	3	2022
Operational Acceptance at Maui	2	2023	2	2023
Operational Acceptance in Europe	4	2024	4	2024
IOC	4	2024	4	2024
Operational Acceptance in Indo-Pacific	1	2025	1	2025
FOC	3	2026	1	2027