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* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206425SF / *Space Situation Awareness Systems*							
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	-	165.008	127.026	105.140	0.000	105.140	115.879	165.311	156.446	159.492	Continuing	Continuing
65A006: *Space Based Space Surveillance*	-	165.008	127.026	105.140	0.000	105.140	115.879	165.311	156.446	159.492	Continuing	Continuing
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 develops new network sensors and improved information integration capabilities across the space surveillance network (SSN) while companion program element 1203940SF fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information integration capabilities within the SSN. Activities funded in this program element (1206425SF) also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration.

The Space-Based Space Surveillance (SBSS) Block 10 satellite was launched September 2010 with a design life through 2017 and an extended operational capability now expected through 2028. The SBSS Follow-On (SBSS FO) program will develop and deliver a system to continue providing space object surveillance from space beyond SBSS Block 10 End-of-Life. The United States Space Force (USSF) and National Reconnaissance Office (NRO) have signed a Memorandum of Agreement partnering SBSS FO with an NRO program based on overlapping requirements. The new partner program is called SILENTBARKER. SILENTBARKER enables timely detection and custody of on orbit threats in order to protect US High Value Assets in space in support of the National Defense Strategy.

SILENTBARKER requirements are based on a Statement of Capabilities and upon the current Space Domain Awareness (SDA) Initial Capabilities Document architectural requirements focused on protecting High Value Assets. SILENTBARKER will provide the capability to search, detect, and track objects from a space-based sensor for timely custody and event detection. Surveillance from space augments and overcomes existing ground sensor limitations with timely 24-hour above-the-weather collection of satellite metric data only possible with a space-based sensor. This data is communicated to operators at the Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and other classified users. This program element includes efforts related to SILENTBARKER, its integration into the broader space superiority architecture, and analysis and experimentation to ensure space-based space surveillance capabilities against the evolving threat.

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 1206425SF *I Space Situation Awareness Systems*

This program also evaluates affordable Space-Based SDA replenishment options to provide system resiliency and situational awareness necessary to operate in the contested space domain studies through technical analysis, risk reduction experiments, affordable prototyping, and partnership with Air Force Research Laboratory (AFRL). In addition, this program leverages opportunities for space-based commercial, international partnerships, and hosted payloads to support the SDA mission.

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 repurpose existing capabilities.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver SILENTBARKER for emergent or unanticipated weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF. In FY 2021 0.206M was expended for civilian pay expenses in this program element, and in FY 2022 0.220M is forecasted for civilian pay expenses in this program element.

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	173.074	127.026	0.000	0.000	0.000
Current President's Budget	165.008	127.026	105.140	0.000	105.140
Total Adjustments	-8.066	0.000	105.140	0.000	105.140
• 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	-2.491	0.000			
• SBIR/STTR Transfer	-5.575	0.000			
• Other Adjustments	0.000	0.000	105.140	0.000	105.140

Change Summary Explanation

FY 2021: $-2.491 decrease for reprogramming to higher Space Force priorities and -$5.575 decrease for SBIR.
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.

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 1206425SF *I Space Situation Awareness Systems*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Space-Based Space Domain Awareness (SDA)	165.008	127.026	105.140

Description: Effort title changed from "SBSS Follow-On (SBSS FO) Design & Development" to "Space-Based Space Domain Awareness (SDA)" due to current Space Force terminology for SDA that includes effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain.
This is not a new start.

Performs space-based SDA analysis, research, and development for the SILENTBARKER system in partnership with the NRO.

FY 2022 Plans:
Continue development of SILENTBARKER expansion assets to increase coverage for deep-space SDA. Continue implementation of ground mission data processing and data dissemination efforts in support of SILENTBARKER ground requirements. Establish requirements and technology enhancements to ensure space-based space surveillance capabilities against the evolving threat for future upgrades, extensions, and augmentations through analysis, prototyping, and experimentation.

Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, prototyping, etc.

FY 2023 Plans:
Prepare for and conduct Pre-Ship Review (PSR) in preparation for launch of the first increment. SILENTBARKER launch of the first increment in addition to on-orbit support to prepare for Initial Operational Capability (IOC). Continue development of SILENTBARKER expansion assets to increase coverage for deep-space SDA. Conduct Critical Design Review (CDR) for expansion effort. Continue implementation and operationalize ground mission data processing and data dissemination efforts in support of Space-Based SDA ground requirements. Continue technology enhancements to ensure space-based space surveillance capabilities against the evolving threat for future upgrades, extensions, and augmentations through analysis, prototyping, and experimentation.

Additionally, FY 2023 funding will continue planning for Space-Based SDA hosted payloads and affordable replenishment activities and allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. In addition will leverage opportunities for SDA space-based commercial, international partnerships, and AFRL partnerships. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and affordable prototyping, integration and test of command and control (C2), resiliency measures and mission partner interfaces, space test/ combat range events, and office support, etc.

FY 2022 to FY 2023 Increase/Decrease Statement:

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding decreased because the annually allocated amounts fluctuate per the 50/50 cost sharing USSF-NRO Interagency Agreement.			
Accomplishments/Planned Programs Subtotals	165.008	127.026	105.140

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Acquisition Strategy was approved to minimize the space-based SDA gap post-SBSS Block 10. SILENTBARKER anticipates Initial Launch Capability in FY 2023. The SBSS FO Materiel Development Decision was approved by the Milestone Decision Authority (MDA) on April 5, 2016. The Acquisition Strategy Panel was completed with the MDA on August 29, 2016. To satisfy the SDA architecture needs, the SBSS FO program requirements combined with an NRO program and were updated in the December 2017 SILENTBARKER Statement of Capabilities. The SBSS FO program remains a Space Force program, but will leverage NRO processes to fulfill SBSS FO space segment and telemetry, tracking, and commanding (TT&C) program segments in order to further National Security Space objectives. Mutual investment for the non-recurring engineering (NRE) cost enables the potential for a larger initial constellation buy and lower unit costs. SILENTBARKER expansion contract awarded 25 Jun 21 to extend capabilities past Phase I.

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 1206425SF / *Space Situation Awarenes s Systems*	**Project (Number/Name)** 65A006 / *Space Based Space Surveillance*	

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
SBSS Follow On Prime Development	MIPR	Various : Various	-	139.540	Nov 2020	104.713	Dec 2021	89.182	Dec 2022	-		89.182	Continuing	Continuing	-
SBSS Technical Mission Analysis	Various	Various : Various, CA	-	1.965	Jan 2021	0.900	Nov 2021	0.831	Nov 2022	-		0.831	Continuing	Continuing	-
SBSS Enterprise SE&I	Various	Various : Various	-	1.699	Dec 2020	1.600	Nov 2021	0.900	Nov 2022	-		0.900	Continuing	Continuing	-
		Subtotal	-	143.204		107.213		90.913		-		90.913	Continuing	Continuing	N/A

Support ($ 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
Civilian Reimbursable Budget Authority	RO	SSC : El Segundo, CA	-	0.206	Dec 2020	0.220	Dec 2021	0.225	Dec 2022	-		0.225	Continuing	Continuing	-
		Subtotal	-	0.206		0.220		0.225		-		0.225	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
FFRDC	RO	Aerospace Corp : Los Angeles, CA	-	0.887	Dec 2020	0.900	Nov 2021	0.831	Nov 2022	-		0.831	Continuing	Continuing	-
A&AS	Various	Various : CA	-	20.587	Jan 2021	18.373	Jan 2022	12.831	Jan 2023	-		12.831	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.124	Mar 2021	0.320	Mar 2022	0.340	Mar 2023	-		0.340	Continuing	Continuing	-
		Subtotal	-	21.598		19.593		14.002		-		14.002	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	-	165.008		127.026		105.140		-		105.140	Continuing	Continuing	N/A

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 1206425SF / *Space Situation Awarenes s Systems*	Project (Number/Name) 65A006 / *Space Based Space Surveillance*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

The SBSS FO project has very minimal organic Space Force resources. The FY 2023 Management Services includes support to parallel efforts for both the SBSS FO and SBSS FO Expansion, including Space Force contributions for prepare for SILENTBARKER launch, check out, and on-orbit support as well as design reviews for SBSS FO Expansion. Additionally, non-recurring engineering investments require increased assistance and advisory services to enable integration of data products between intelligence community and Space Force infrastructure until integration is mature and stable.

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 1206425SF / *Space Situation Awarenes s Systems*	**Project (Number/Name)** 65A006 / *Space Based Space Surveillance*

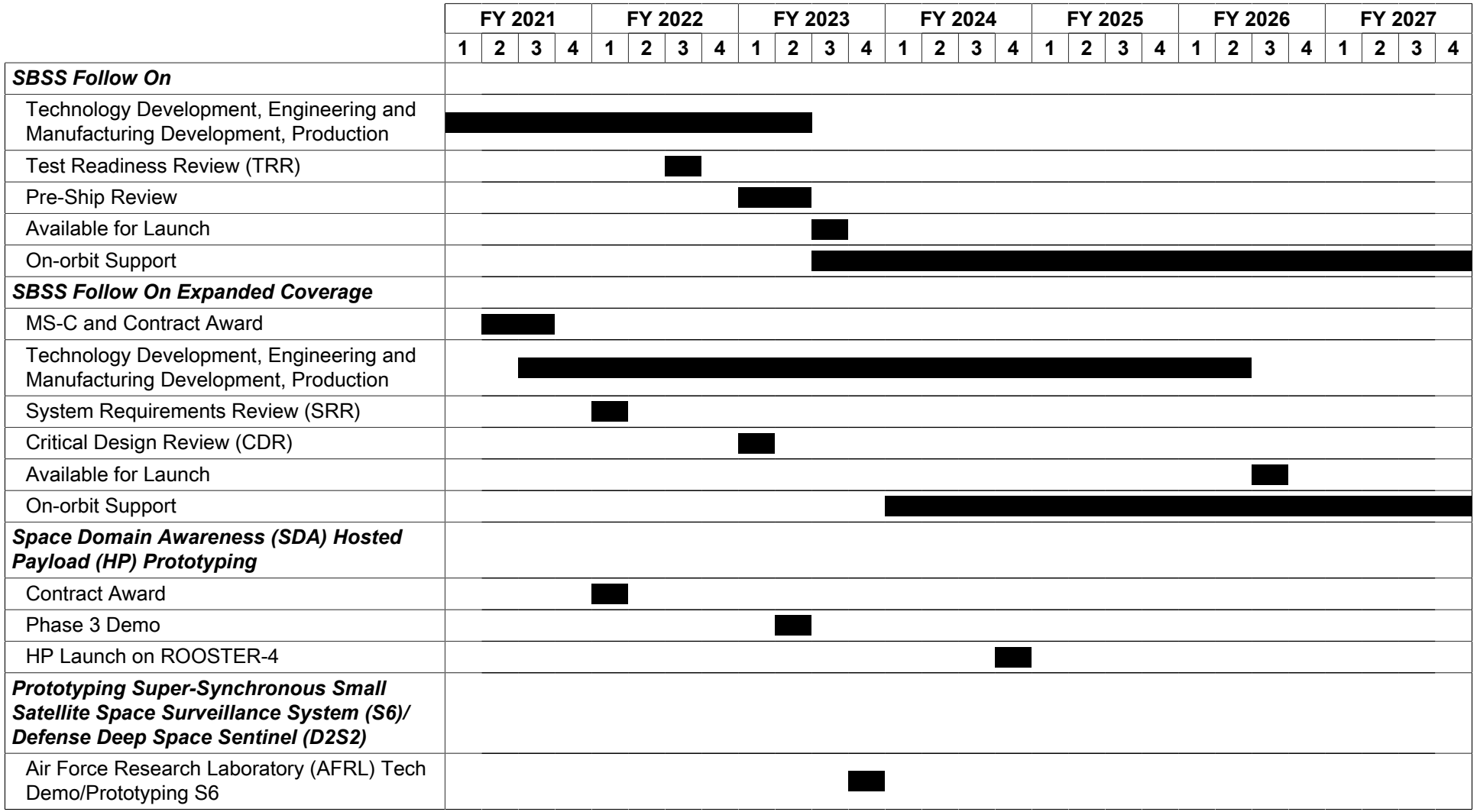

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1206425SF / *Space Situation Awarenes s Systems*	**Project (Number/Name)** 65A006 / *Space Based Space Surveillance*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
AFRL Tech Demo/Prototyping D2S2													■															

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 1206425SF / *Space Situation Awarenes s Systems*	**Project (Number/Name)** 65A006 / *Space Based Space Surveillance*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SBSS Follow On				
Technology Development, Engineering and Manufacturing Development, Production	1	2021	2	2023
Test Readiness Review (TRR)	3	2022	3	2022
Pre-Ship Review	1	2023	2	2023
Available for Launch	3	2023	3	2023
On-orbit Support	3	2023	4	2027
SBSS Follow On Expanded Coverage				
MS-C and Contract Award	2	2021	3	2021
Technology Development, Engineering and Manufacturing Development, Production	3	2021	2	2026
System Requirements Review (SRR)	1	2022	1	2022
Critical Design Review (CDR)	1	2023	1	2023
Available for Launch	3	2026	3	2026
On-orbit Support	1	2024	4	2027
Space Domain Awareness (SDA) Hosted Payload (HP) Prototyping				
Contract Award	1	2022	1	2022
Phase 3 Demo	2	2023	2	2023
HP Launch on ROOSTER-4	4	2024	4	2024
Prototyping Super-Synchronous Small Satellite Space Surveillance System (S6)/ Defense Deep Space Sentinel (D2S2)				
Air Force Research Laboratory (AFRL) Tech Demo/Prototyping S6	4	2023	4	2023
AFRL Tech Demo/Prototyping D2S2	1	2024	1	2024