Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awareness Operations*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	44.809	0.000	44.809	58.968	67.760	66.676	45.107	Continuing	Continuing
67A017: *Sensor Service Life Extension Program*	-	0.000	0.000	44.809	0.000	44.809	58.968	67.760	66.676	45.107	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1203940F, Space Situation Awareness Operations, Project 67A017, Sensor Service Life Extension Program efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1203940SF, Space Situation Awareness Operations, Project 67A017, Sensor Service Life Extension Program from Appropriation 3600, Budget Activity 07 due to the creation of a new Appropriation for Space Force.

Space Situational Awareness (SSA) is knowledge of all aspects of space related to operations. As the foundation for space control, SSA encompasses surveillance of all space objects and activities; detailed reconnaissance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering intelligence on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. SSA also encompasses the integration, exploitation and delivery of data sources to facilitate the battle management and command and control of space forces. This program element fields, upgrades, modifies, modernizes, operationalizes, operates and maintains Space Force sensors and information integration capabilities within the SSA Space Surveillance Network (SSN) while companion program element 1206425F, 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.

Service Life Extension Programs (SLEPs) are efforts to upgrade, operationalize and extend the life of operational SSA sensors. These SLEPs extend the serviceable life of assets and maintain critical capability by replacing aging and increasingly unsustainable components with modern and sustainable equipment. In addition, the SLEPs themselves may be designed to increase capabilities not currently realized. As the need arises in the execution year, funds in this project may be used to begin SLEPs on additional efforts. These efforts may include prototyping and technology demonstrations.

Global Sensor Watch (GSW) Program provides an integrated SSA Tip & Cue capability that implements a survivable architecture providing overlapping, assured, and viable surveillance options for executing event response, multiple level security processing of SSA data and automated cross-sensor tipping & cueing worldwide. Other efforts to support Battle Management Command & Control (BMC2) in space include developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of both space objects of interest and new foreign launches; enhancing space environmental monitoring solutions; optimizing commercial, intelligence community (IC) & Missile Defense Agency sensors to better support BMC2; developing & executing Joint Functional Space Component Command (JFSCC) exercises such as Combined Space Operations Center and National Space Defense Center Experimentation, Test and Training Initiative to test & optimize Space Control capabilities, Concept of Operations (CONOPS) development to increase probability of survival for blue assets, and refining requirements

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across the space enterprise; enhancing sensor performance to close the solar exclusion gap leveraging technologies such as optical daylight tracking and incorporating commercial & IC sensors; and improving legacy paths to support bi-directional machine-to-machine sensor communications enabling a more complete BMC2 capability.

Space Surveillance Telescope (SST) provides rapid un-cued search, detection and tracking of dim objects in deep space and offers enhanced capabilities addressing critical space situational awareness gaps.

Ground Based Radar Upgrades improves the sensitivity, search capabilities and CONOPS of existing ground-based SSA sensors to better support custody and fire control timelines.

The FY 2021 funding request was reduced by $3.446 million to account for the availability of prior year execution balances.

Programs and projects in the space warfighting enterprise are evaluating ways to maximize innovation, resiliency, and our ability to rapidly respond to known and emerging threats. Space enterprise efforts aim to execute technology risk reduction efforts, integration of new or repurposed capabilities, enterprise decision-making tools, experimentation, and rapid prototyping and fielding via all appropriate acquisition authorities and contract mechanisms.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing 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, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 120639S2F and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	44.809	0.000	44.809
Total Adjustments	0.000	0.000	44.809	0.000	44.809
• 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	44.809	0.000	44.809

Change Summary Explanation

FY 2021: +$44.809M; funds starting in FY 2021 were transferred from RDT&E, Air Force to RDT&E, Space Force. This total includes a $26.975M increase from FY 2020 to FY 2021 accounts for: 1) dedicated funding for the SSA data architecture (known as the Unified Data Library) and 2) funding to upgrade sensors for classified activities. Increased funding is also supporting operational roll-out of capability whose development was started in FY 2020.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Global Sensor Watch Program	0.000	0.000	39.897
Description: Global Sensor Watch (GSW) Program provides an integrated SSA Tip and Cue capability that implements a survivable architecture that provides overlapping, assured, and viable surveillance options for executing event response, multiple level security processing of SSA data and automated cross-sensor tipping and cueing around the globe. Other efforts to support Battle Management Command & Control (BMC2) in space include developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of deep space SHIOs; optimizing intelligence community & MDA sensors to better support BMC2; enhancing space environmental monitoring solutions; developing & executing JFCC Space exercises to test & optimize Space Control capabilities, CONOPS development to increase probability of survival for blue assets, and refining requirements across space enterprise; enhancing sensor performance to close the solar exclusion gap leveraging technologies and improving legacy communication paths to support bi-directional machine-to-machine sensor communications enabling a more complete BMC2 capability.			
FY 2020 Plans: N/A			
FY 2021 Plans:			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Complete prime contractor testing. Conduct system training with RAAF Operators and Australian Level 1 maintainers. Accomplish DT&E and complete OT&E planning. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A			
Title: Space Surveillance Telescope DT&E/OT&E ***Description:*** Space Surveillance Telescope (SST) provides rapid un-cued search, detection and tracking of dim objects in deep space and offers enhanced capabilities addressing critical space situational awareness gaps. SST relocation from White Sands Missile Range, NM to Western Australia is expected complete in FY 2021. Efforts include executing SST sensor reassembly, subsystem integration and testing subsequent to Australian facility delays. This includes completion of SST integration into a new facility, SST subsystem and system testing & Developmental Test/Operational Test and Evaluation (DT/OT&E). ***FY 2020 Plans:*** N/A ***FY 2021 Plans:*** Complete SST reassembly, subsystem integration, and testing, including facility integration, SST subsystem and system testing, and DT/OT&E. Space Acquisition must respond with speed and agility to emerging adversary threats. Space acquisition must respond with speed and agility to emerging adversary threats. Rapidly respond and implement system resiliency and situational awareness necessary to operate in the contested space domain. RDT&E funding is required to support this transformation and enable Space Superiority end-to-end integration activities such as, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, architectural development, systems engineering, demonstrations, testing, command and control integration, mission partner integration, and space test/combat range events. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A	0.000	0.000	4.912
Accomplishments/Planned Programs Subtotals	0.000	0.000	44.809

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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E. Acquisition Strategy

The acquisition strategies for the Global Sensor Watch and Space Surveillance Telescope programs includes a mix of modifications to existing Air Force or Space Force contracts and directing funds to other AF, SF or DoD organizations for contract support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSW Operationalization	C/TBD	Multiple : Colorado Springs, CO	-	-		-		31.697	Dec 2020	-		31.697	Continuing	Continuing	-
GSW SW Development 1	Various	AFRL : Various	-	-		-		2.750	Feb 2021	-		2.750	Continuing	Continuing	-
GSW SW Development 2	Various	MIT/LL : Lexington, MA	-	-		-		2.800	Jan 2021	-		2.800	Continuing	Continuing	-
GSW SW Development 3	Various	Sandia National Labs : Albuquerque, NM	-	-		-		0.600	Nov 2020	-		0.600	Continuing	Continuing	-
Space Surveillance Telescope	Various	Multiple : Exmuth Australia	-	-		-		4.912	Oct 2020	-		4.912	Continuing	Continuing	-
		Subtotal	-	-		-		42.759		-		42.759	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Multiple : Colorado Springs, CO	-	-		-		1.200	Nov 2020	-		1.200	Continuing	Continuing	-
FFRDC	Various	Multiple : Colorado Springs, CO	-	-		-		0.700	Dec 2020	-		0.700	Continuing	Continuing	7.788
Other Support	Various	Muliple : Colorado Springs, CO	-	-		-		0.150	Nov 2020	-		0.150	Continuing	Continuing	16.626
		Subtotal	-	-		-		2.050		-		2.050	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		44.809		-		44.809	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

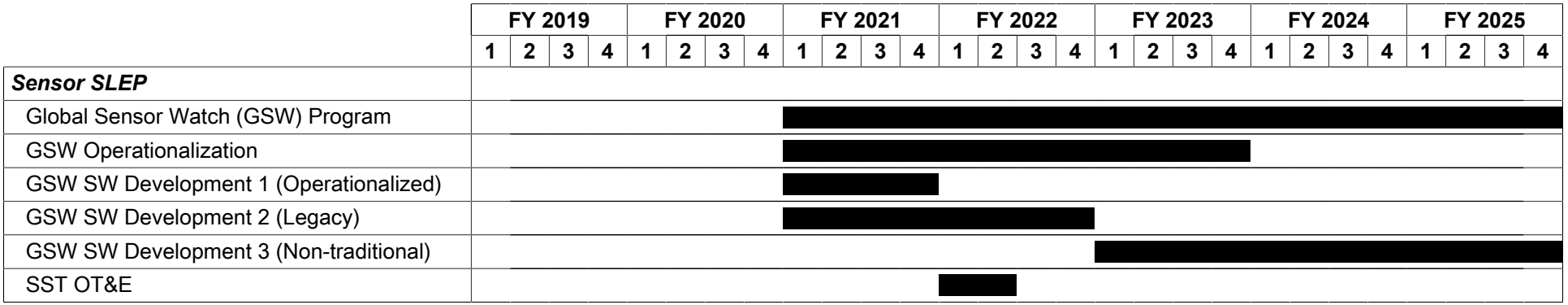

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Sensor SLEP				
Global Sensor Watch (GSW) Program	1	2021	4	2025
GSW Operationalization	1	2021	4	2023
GSW SW Development 1 (Operationalized)	1	2021	4	2021
GSW SW Development 2 (Legacy)	1	2021	4	2022
GSW SW Development 3 (Non-traditional)	1	2023	4	2025
SST OT&E	1	2022	2	2022