

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
---	---

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	-	30.356	105.062	230.621	0.000	230.621	215.192	254.466	288.246	293.867	Continuing	Continuing
640290: <i>Deep Space Advanced Radar Concept</i>	-	30.356	105.062	230.621	0.000	230.621	215.192	254.466	288.246	293.867	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.

Deep Space Advanced Radar Capability (DARC) is a ground-based, SDA radar system to detect, track, and maintain custody of deep space objects 24/7, through the solar exclusion gap. DARC will augment the SSN as an additional sensor with increased capacity and capability for deep space object custody, providing full global coverage.

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 civilian pay expenses required to manage, execute, and deliver DARC 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.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
---	---

The total cost of the DARC Site 1 Middle Tier of Acquisition effort is \$866.3 million, including RDT&E and procurement of prototype units. DARC Site 1 is not fully funded across the Future Years Defense Program. The Department of the Air Force is assessing all options to address the funding shortfalls for MTA programs including additional funding in a future budget request, performance trades based on technical maturity, or transition to alternative pathways

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	33.359	123.262	0.000	0.000	0.000
Current President's Budget	30.356	105.062	230.621	0.000	230.621
Total Adjustments	-3.003	-18.200	230.621	0.000	230.621
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-18.200			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.123	0.000			
• SBIR/STTR Transfer	-0.880	0.000			
• Other Adjustments	0.000	0.000	230.621	0.000	230.621

Change Summary Explanation

FY 2021: -2.123 decrease for higher Space Force priorities and -0.880 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.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: DARC Site 1 Operational Capability	30.356	105.062	230.621
Description: The DARC Middle Tier of Acquisition (MTA) activity will develop, test, and deliver one DARC site with a current estimated completion date of CY 2025. It will also provide a foundation for up to two more future sites located strategically around the world to provide global deep space radar capability to support SDA. The system will be responsive to regularly scheduled and un-scheduled tasks to locate, identify, characterize deep space objects and report the results to Battle Management Command and Control locations and SSN.			
FY 2022 Plans:			

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
--	-------------------------

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
---	---

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>The DARC Site 1 competitive development contract award moved from FY 2021 to FY 2022 in order to complete technology maturation and risk reduction efforts. Slight delay in development contract award is not expected to impact timely funding execution nor anticipated 2025 delivery of Site 1 capability.</p> <p>Complete source selection and award contract for Site 1 design, development and build. Begin Site 1 design and development activities, including hardware purchases, initiate software development and integration, and conduct Design Reviews to support the build of the operational system. Award contracts for continuous third-party mission software development. Continue to negotiate host nation agreements with Pacific and European partners, finalize agreement with Pacific partner. Conduct Environmental Assessment (EA) for Site 1.</p> <p>Additionally, FY 2022 funding allows 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 (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc.</p> <p>FY 2023 Plans: Continue Site 1 design and development activities including design reviews, hardware purchases, software development and integration, and construction. Complete Site 1 EA. Complete final Facility Design Review (90%) and Critical Design Review. Purchase, install and check out hardware including, but not limited to, the antennas, transmitters, receiver hardware, and associated processing, cabling, communications subsystems. Begin construction of Site 1 including roads, buildings, utilities, foundations, and installation of all antenna structures. Perform additional site development efforts such as the construction of facility-support and site infrastructure to include backup generator buildings, fuel storage (tank farms), electrical substations for power site distribution, wastewater treatment/septic & leach, non-potable water storage / fire protection distribution (site & buildings), water treatment (potable) and physical security equipment to meet protection level 3 (PL3) requirements. Finalize plans for and begin implementing physical security for Site 1, to include any required equipment such as site perimeter fencing, and standalone fencing for both antenna arrays and site main power station to meet site safety requirements. Begin preparation for and install of fiber optics (COMM) as well as connection to existing and/or new infrastructure such as power grid, backup generators, and main water line. Complete purchases for all long-lead facility equipment for Site 1 as rapidly as possible in order to minimize schedule, these will have been initiated in parallel with completing required EAs.</p> <p>Award additional contracts for continuous third-party mission software development and begin to integrate that software into the system. Continue to negotiate and finalize host nation agreements with Pacific and European partners.</p>			

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Additionally, FY 2023 funding will allow the program to continue implementing 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 (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 increased due to continued ramp-up of the DARC Site 1 Rapid Prototype design, development and build contracts to include site preparation and hardware purchases.</p>				
Accomplishments/Planned Programs Subtotals		30.356	105.062	230.621
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
<p>Project utilizes existing DoD engineering and study contracts and activities to conduct science and technology development and data analysis activities. Preliminary/critical design effort for the technology maturation and prototype commenced in FY 2017. A Broad Agency Announcement (BAA) was used to award seven Integrated System Engineering Team (ISET) contracts which allow for organizations to participate, advise the government, and gain insight into the prototype design and build. In May of 2019, DARC was designated as an MTA under Section 804 of the 2016 National Defense Authorization Act (NDAA). In 2020, DARC was directed to pursue a Rapid Prototyping Middle Tier Acquisition program for Site 1. The DARC Site effort will be executed through two separate contract elements: The Prime System Integrator (PSI) will be acquired via a single, competitive award through the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) agreement and third-party software development through multiple SpEC OTA agreements. The Space Force intends to develop and field two additional DARC sites in the future to culminate in a final operational system of three global sites to ensure SDA coverage. A follow-on MTA pathway strategy based on the success of the Site 1 rapid prototype and an MTA transition plan are being developed for Sites 2 and 3 in accordance with DoDI 5000.80.</p>				

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radar Concept</i>
---	---	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
DARC Non-Recurring Engineering (NRE)/ Advanced Hardware Purchase	Various	Various : Various	-	21.242	Jun 2021	49.714	Jan 2022	-		-		-	0.000	70.956	-
DARC Technical Mission Analysis	Various	Various : Various	-	-		-		6.195	Jan 2023	-		6.195	Continuing	Continuing	-
DARC System Development	C/CPIF	Northrop Grumman : Colorado Springs, CO	-	-		45.297	Feb 2022	212.409	Jan 2023	-		212.409	0.000	257.706	-
Subtotal			-	21.242		95.011		218.604		-		218.604	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
DARC Prototype System and Sustainment Analyses	Various	Various : Various	-	0.150	May 2021	0.150	May 2022	1.005	May 2023	-		1.005	Continuing	Continuing	-
Subtotal			-	0.150		0.150		1.005		-		1.005	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	-	5.134	Jun 2021	5.031	Nov 2021	8.525	Nov 2022	-		8.525	Continuing	Continuing	-
FFRDC	RO	MITRE Corp. : Colorado Springs, CO	-	3.730	Nov 2020	4.670	Nov 2021	2.287	Nov 2022	-		2.287	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	0.100	Nov 2020	0.200	Nov 2021	0.200	Nov 2022	-		0.200	Continuing	Continuing	-
Subtotal			-	8.964		9.901		11.012		-		11.012	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force							Date: April 2022				
Appropriation/Budget Activity 3620F / 4			R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>				Project (Number/Name) 640290 / <i>Deep Space Advanced Radar Concept</i>				
	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	-	30.356	105.062		230.621	-	230.621	Continuing	Continuing	N/A	

Remarks
 The DARC project has minimal organic resources. The FY 2023 increase in Management Services is due to parallel efforts to finalize international agreements, complete source selection, award the Site 1 contract, begin development work on Site 1 including roads, buildings, utilities, foundations and installation of all antenna structures, continue third-party mission software development and begin to integrate third-party software into the system, and begin planning and strategy development for Sites 2 and 3.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radars Concept</i>

	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
Prototype Risk Reduction Build and Test																												
Tech Demo Build and Test																												
Develop Documentation and Request for Proposal																												
Operational Demonstrations																												
Site 1 MTA Start																												
Request for DARC Site 1 MTA Prototype Proposal Release																												
Site 1 MTA Source Selection																												
Site 1 Environmental Assessment																												
Site 1 MTA Contract Award																												
Software Development																												
Preliminary Design Review																												
Site 1 MTA Development																												
Critical Design Review																												
Site 1 Construction																												
Site 2 Development																												
Site 1 MTA End (Operational Leave Behind Capability)																												
Site 3 Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radar Concept</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Prototype Risk Reduction Build and Test</i>				
Tech Demo Build and Test	1	2021	3	2021
Develop Documentation and Request for Proposal	1	2021	3	2021
Operational Demonstrations	2	2021	3	2021
Site 1 MTA Start	3	2021	3	2021
Request for DARC Site 1 MTA Prototype Proposal Release	4	2021	4	2021
Site 1 MTA Source Selection	4	2021	2	2022
Site 1 Environmental Assessment	4	2021	1	2023
Site 1 MTA Contract Award	2	2022	2	2022
Software Development	2	2022	2	2024
Preliminary Design Review	2	2022	2	2022
Site 1 MTA Development	2	2022	1	2025
Critical Design Review	1	2023	1	2023
Site 1 Construction	1	2023	1	2025
Site 2 Development	2	2024	3	2026
Site 1 MTA End (Operational Leave Behind Capability)	2	2025	4	2025
Site 3 Development	3	2025	2	2026