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**Department of Defense
Fiscal Year (FY) 2022 Budget Estimates**

May 2021



Air Force

Justification Book Volume 1 of 1

Research, Development, Test & Evaluation, Space Force

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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

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>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	0.000	33.359	123.262	0.000	123.262	-	-	-	-	-	-
640290: <i>Deep Space Advanced Radar Concept</i>	-	0.000	33.359	123.262	0.000	123.262	-	-	-	-	-	-
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 Concept (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 & Missile Systems Center (SMC) 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, SMC 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.

The FY 2022 funding request was reduced by \$7.5M to account for the availability of prior year execution balances.

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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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	33.359	141.296	0.000	141.296
Current President's Budget	0.000	33.359	123.262	0.000	123.262
Total Adjustments	0.000	0.000	-18.034	0.000	-18.034
• 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	-18.034	0.000	-18.034

Change Summary Explanation

The FY 2022 funding request was reduced by \$9M to align with phasing of program schedule. Includes \$5M transferred to Ground Based Optical Sensor System (GBOSS) Project 65A037, Program Element 1203940SF, Space Situation Awareness Operations and the remainder was transferred for higher Space Force priorities. The FY 2022 funding request was reduced by \$7.5M to account for the availability of prior year execution balances. The FY 2022 funding request was reduced by \$1.1M to account for inflation.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
Title: DARC Site 1 Operational Capability	-	33.359	123.262
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 2021 Plans: Finalize and release Request for Proposal (RFP) and conduct source selection. Continue prototype build, test, and operational demonstrations, and initiate early hardware purchases for site 1 to support rapid prototyping pathway development timelines. Implement system resiliency and situational awareness changes necessary to operate in the contested space domain. RDT&E			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>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.</p> <p>FY 2022 Plans: 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 for Site 1.</p> <p>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 (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The increase from FY 2021 to FY 2022 is for award of the DARC Site 1 Rapid Prototype design, development and build contracts.</p>			
Accomplishments/Planned Programs Subtotals	-	33.359	123.262

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

N/A

Remarks

E. Acquisition Strategy

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

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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 will be developed later for Sites 2 and 3 in accordance with DoDI 5000.80.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

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>
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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 : TBD	-	-		24.245	Mar 2021	60.319	Jan 2022	-		60.319	-	-	-
DARC Site 1 Capability	TBD	TBD : TBD	-	-		-		45.297	Mar 2022	-		45.297	-	-	-
Subtotal			-	-		24.245		105.616		-		105.616	-	-	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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 : TBD	-	-		0.150	Mar 2021	0.150	Mar 2022	-		0.150	-	-	-
Subtotal			-	-		0.150		0.150		-		0.150	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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 : TBD	-	-		5.134	Jun 2021	14.371	Nov 2021	-		14.371	-	-	-
FFRDC	RO	MITRE Corp. : Colorado Springs, CO	-	-		3.730	Nov 2020	2.925	Nov 2021	-		2.925	-	-	-
Other Support	Various	Various : Colorado Springs, CO	-	-		0.100	Nov 2020	0.200	Nov 2021	-		0.200	-	-	-
Subtotal			-	-		8.964		17.496		-		17.496	-	-	N/A

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	-	33.359	123.262	123.262	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force							Date: May 2021			
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 The DARC project has minimal organic resources. The FY 2022 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, prepare for and execute design reviews and begin preparations for Site 2 and Site 3 development activities.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force			Date: May 2021
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 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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>Prototype Risk Reduction Build and Test</i>																												
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																												
Initial Design Review																												
Site 1 MTA Development																												
Final Design Review																												
Site Construction																												
Site 2 Development																												
Site 1 MTA End (Operational Leave Behind Capability)																												
Site 3 Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
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	3	2021	3	2021
Site 1 MTA Source Selection	3	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
Initial Design Review	2	2022	2	2022
Site 1 MTA Development	3	2022	2	2025
Final Design Review	4	2022	4	2022
Site Construction	1	2023	3	2024
Site 2 Development	2	2024	3	2026
Site 1 MTA End (Operational Leave Behind Capability)	2	2025	2	2025
Site 3 Development	3	2025	2	2026