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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206425F / <i>Space Situation Awareness Systems</i>
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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	-	32.351	29.776	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
640290: <i>Deep Space Advanced Radar Concept</i>	-	32.351	29.776	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206425F, Deep Space Advanced Radar Concept efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206425SF Deep Space Advanced Radar Concept from Appropriation 3600, Budget Activity 04 due to the creation of a new Appropriation for Space Force.

Deep Space Advanced Radar Concept (DARC) will leverage ongoing defense science and technology efforts to mature radar concepts and technologies to develop and evaluate prototypes that demonstrate increased sensitivity, capacity, search rates, and scalability to detect, track and maintain custody of objects in deep space orbit. This effort will analyze and select the most promising technologies to move forward into system development and operations and a program of record (PoR). DARC will augment the Space Surveillance Network (SSN) as an additional sensor with increased capacity and capability for deep space object custody at Geosynchronous Earth Orbit (GEO).

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 1206392F and 1206398F.

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.

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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	33.469	29.776	33.370	0.000	33.370
Current President's Budget	32.351	29.776	0.000	0.000	0.000
Total Adjustments	-1.118	0.000	-33.370	0.000	-33.370
• 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	-1.118	0.000			
• Other Adjustments	0.000	0.000	-33.370	0.000	-33.370

Change Summary Explanation

FY 2021: -\$33.3704M; funds starting in FY 2021 were transferred from RDT&E, Air Force to RDT&E, Space Force.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
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Title: DARC Technology Maturation and Prototype Development	32.351	0.000	0.000
Description: Deep Space Advanced Radar Concept (DARC) will leverage ongoing defense science and technology efforts to mature radar concepts and technologies to develop and evaluate prototypes that demonstrate increased sensitivity, capacity, search rates, and scalability to detect, track and maintain custody of objects in deep space orbit. This effort will analyze and select the most promising technologies to move forward into system development and operations and a PoR.			
FY 2020 Plans: N/A			
FY 2021 Plans: N/A			
FY 2020 to FY 2021 Increase/Decrease Statement: N/A			
Title: DARC Site 1 Operational Capability	0.000	29.776	0.000
Description: The Deep Space Advance Radar Capability Middle Tier Acquisition (MTA) activity will use knowledge gained through the Deep Space Advanced Radar Concept technology demonstration to identify system specifications and a Government Reference Architecture (GRA). The specification and GRA will then support a competition for a global Deep Space Capability			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>system. This MTA activity will use market research and a Government Reference Architecture developed previously to provide the knowledge to determine the acquisition approach through further prototyping and/or rapid acquisition.</p> <p>The MTA activity will develop, test, and deliver three radar sites located strategically around the world to provide a global Deep Space Radar Capability to support Space Situational Awareness (SSA). The system will be responsive to regularly scheduled and un-scheduled tasks to locate, identify, characterize deep space objects and report the results to the SSN and Battle Management Command and Control locations.</p> <p>Leverage ongoing DARC Technology Maturation and Prototype Development efforts and defense science and technology efforts to initiate PoR for the DARC global radar capability. Supports standup of the DARC program office, award of contract for the DARC global radar capability, and completion of the engineering, manufacturing, and development of the first site through Critical Design Review (CDR).</p> <p>FY 2020 Plans: Prepare for Request for Proposal (RFP) for DARC PoR to develop and deploy the DARC global radar capability. Investigate and conduct activities to reduce risk for the DARC program. Rapidly respond to and 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, experimentation, prototyping, etc.</p> <p>FY 2021 Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>			
Accomplishments/Planned Programs Subtotals	32.351	29.776	0.000

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 Middle Tier Acquisition under Section 804 of the 2016 National Defense Authorization Act (NDAA). DARC PoR will be a full

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and open industry competition combining both University Affiliated Research Centers (UARC) and industry. The PoR will consist of three global, incrementally fielded, and simultaneously constructed sites during the years FY 2023 through FY 2025.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206425F / <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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Concept Definition, Prototype Development and Analysis	SS/CPAF	JHL-APL : Laurel, MD	-	24.946	Apr 2019	-		0.000		-		0.000	0.000	24.946	-
DARC Site 1 Capability	TBD	TBD : TBD	-	-		17.773	Jul 2020	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	24.946		17.773		0.000		-		0.000	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Prototype System and Sustainment Analyses	PO	AFRL : Albuquerque, NM	-	3.000	Jan 2019	0.010	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	3.000		0.010		0.000		-		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	-	1.200	Dec 2018	5.350	Jul 2020	0.000		-		0.000	Continuing	Continuing	-
FFRDC	SS/FP	MITRE Corp : Colorado Springs, CO	-	3.155	Oct 2018	6.100	Jul 2020	0.000		-		0.000	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	0.050	Oct 2018	0.543	Jul 2020	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	4.405		11.993		0.000		-		0.000	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			-	32.351	29.776	0.000	-	0.000	Continuing	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206425F / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radar Concept</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
DARC																												
Prototype Build and Test	████████████████																											
Operational Demonstrations								██																				
MTA Designation			██																									
Program of Record Stand Up			██████																									
Develop Documentation and Request for Proposal					██████████████																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206425F / <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
DARC				
Prototype Build and Test	1	2019	4	2020
Operational Demonstrations	4	2020	4	2020
MTA Designation	3	2019	3	2019
Program of Record Stand Up	3	2019	4	2019
Develop Documentation and Request for Proposal	1	2020	4	2020

Note
DARC Site 1 estimated completion date and Initial Operating Capability (IOC) is FY 2025.