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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 1206425F I Space Situation Awareness Systems							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	43.290	33.469	29.776	0.000	29.776	33.370	141.296	256.684	295.430	Continuing	Continuing
640290: Deep Space Advanced Radar Concept	-	43.290	33.469	29.776	0.000	29.776	33.370	141.296	256.684	295.430	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

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.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	
Previous President's Budget	34.764	39.338	29.776	0.000	29.776	
Current President's Budget	43.290	33.469	29.776	0.000	29.776	
Total Adjustments	8.526	-5.869	0.000	0.000	0.000	
• Congressional General Reductions	0.000	-0.869				
• Congressional Directed Reductions	0.000	-5.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	10.000	0.000				
• Congressional Directed Transfers	0.000	0.000				
• Reprogrammings	0.000	0.000				
• SBIR/STTR Transfer	-1.474	0.000				
• Other Adjustments	0.000	0.000	0.000	0.000	0.000	
Change Summary Explanation						
FY 2018: \$10.000M Congressional increase to accelerate prototype design efforts.						
FY 2019: \$5.000M Congressional reduction for insufficient justification.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
Title: DARC Technology Maturation and Prototype Development				43.290	33.469	0.000
Description: Leverage ongoing defense science and technology efforts to mature radar concepts and technologies, 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. Provide technical support to oversee the design, development and demonstration of the DARC Prototype radar. Initiate Program of Record (PoR) for the DARC global radar capability. Current funding supports completion of the DARC Prototype and demonstration effort, standup of the DARC System Program Office (SPO), award of contract for the DARC global radar capability, and completion of the Engineering, Manufacturing, and Development (EMD) of the first site through Critical Design Review (CDR).						
FY 2019 Plans: Continue DARC Prototype build and testing. Conduct demonstrations with the DARC Prototype radar. Prepare for and complete Materiel Development Decision (MDD) milestone for the Program of Record (PoR) to develop and deploy the DARC global radar capability. Stand up DARC System Program Office (SPO), prepare milestone documentation, draft Request for Proposal (RFP), begin developing technical baseline. Continue program office support and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc.						
FY 2020 Plans:						

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>		<b>R-1 Program Element (Number/Name)</b> PE 1206425F / <i>Space Situation Awareness Systems</i>		
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>
Complete DARC Prototype build. Begin DARC prototype radar testing. Conduct risk reduction activities to address Mission Management software and Signal Processing for DARC. These risk reduction activities are key to successful transition from prototype activities to operational system development. Advances in Mission Management and Signal Processing may also be advantageous to existing and planned radar upgrades. Prepare for and release RFP for DARC Program of Record (PoR) to develop and deploy the DARC global radar capability. Continue developing technical baseline. Rapidly respond 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.				
<b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> FY 2020 decreased compared to FY 2019 by \$33.469M. Justification for this decrease is described above.				
<b>Title:</b> DARC Site 1 Operational Capability  <b>Description:</b> Leverage ongoing DARC Technology Maturation and Prototype Development efforts and defense science and technology efforts to initiate program of record (PoR) for the DARC global radar capability. Supports standup of the DARC System 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).  <b>FY 2019 Plans:</b> N/A  <b>FY 2020 Plans:</b> Prepare for and release 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.  <b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> FY 2020 increased compared to FY 2019 by \$29.776M. Justification for this increase is described above.		0.000	0.000	29.776
<b>Accomplishments/Planned Programs Subtotals</b>		43.290	33.469	29.776
<b>D. Other Program Funding Summary (\$ in Millions)</b> N/A  <b>Remarks</b>				

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<b>Appropriation/Budget Activity</b> 3600: Research, Development, Test & Evaluation, Air Force / BA 4: Advanced Component Development & Prototypes (ACD&P)		<b>R-1 Program Element (Number/Name)</b> PE 1206425F / Space Situation Awareness Systems
<b>E. Acquisition Strategy</b> Project utilizes existing DoD engineering and study contracts and activities to conduct science and technology development and data analysis activities. Preliminary/critical design effort 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 and gain insight into the prototype design and build. DARC PoR will be a full and open industry competition.		
<b>F. Performance Metrics</b> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
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>					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DARC Concept Definition, Prototype Development and Analysis	Various	Various : Various	-	34.993	Jan 2018	26.064	Apr 2019	-		-		-	Continuing	Continuing	-
Engineering, Manufacturing, & Development (EMD)	TBD	TBD : TBD	-	-		-		17.773	Jul 2020	-		17.773	Continuing	Continuing	-
Subtotal			-	34.993		26.064		17.773		-		17.773	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype System and Sustainment Analyses	PO	AFRL : Albuquerque, NM	-	4.000	Jan 2018	3.000	Jan 2019	0.010	Jan 2020	-		0.010	Continuing	Continuing	-
Subtotal			-	4.000		3.000		0.010		-		0.010	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	-	1.480	Dec 2017	1.200	Dec 2018	5.350	Jul 2020	-		5.350	Continuing	Continuing	-
FFRDC	SS/FP	MITRE Corp : Colorado Springs, CO	-	2.757	Oct 2017	3.155	Oct 2018	6.100	Jul 2020	-		6.100	Continuing	Continuing	-
Other Support	Various	SMC/SYG : Colorado Springs, CO	-	0.060	Oct 2017	0.050	Oct 2018	0.543	Jul 2020	-		0.543	Continuing	Continuing	-
Subtotal			-	4.297		4.405		11.993		-		11.993	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	43.290		33.469		29.776		-		29.776	Continuing	Continuing	N/A

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	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Air Force			<b>Date:</b> February 2019		
<b>Appropriation/Budget Activity</b> 3600 / 4		<b>R-1 Program Element (Number/Name)</b> PE 1206425F / <i>Space Situation Awareness Systems</i>			<b>Project (Number/Name)</b> 640290 / <i>Deep Space Advanced Radar Concept</i>

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
<b>DARC</b>																												
Prototype Design																												
Prototype Build and Test																												
Operational Demonstrations																												
Material Development Decision																												
Program of Record Stand Up																												
Develop Documentation and Request for Proposal																												
Milestone B																												
Request for Proposal Release																												
Source Selection																												
Contract Award																												
Site 1 Development																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Air Force			<b>Date:</b> February 2019
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206425F / <i>Space Situation Awareness Systems</i>	<b>Project (Number/Name)</b> 640290 / <i>Deep Space Advanced Radar Concept</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>DARC</b>				
Prototype Design	1	2018	3	2018
Prototype Build and Test	4	2018	3	2020
Operational Demonstrations	4	2020	4	2020
Material Development Decision	2	2019	2	2019
Program of Record Stand Up	3	2019	4	2019
Develop Documentation and Request for Proposal	1	2020	2	2020
Milestone B	3	2020	3	2020
Request for Proposal Release	4	2020	4	2020
Source Selection	1	2021	3	2021
Contract Award	4	2021	4	2021
Site 1 Development	4	2021	3	2024

**Note**  
DARC Site 1 estimated completion date and initial operating capability (IOC) is FY 2025.