Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force											Date: February 2018	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206425F / *Space Situation Awareness Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.901	34.764	39.338	0.000	39.338	29.776	43.770	97.296	158.684	Continuing	Continuing
640290: *Deep Space Advanced Radar Concept*	-	9.901	34.764	39.338	0.000	39.338	29.776	43.770	97.296	158.684	Continuing	Continuing

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 /or operations; eventually creating 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).

The current and future space domain demands that space systems be responsive to new and changing threats, and can rapidly integrate new capabilities to make our warfighting force more resilient in a contested battlespace. This agility, survivability, and rapid reconstitution must extend through the entire space warfighting enterprise, to include how we learn about the threat; develop solutions; acquire, test, deploy, train, operate and integrate new systems into the greater system of systems; and ensure our space mission force is ready to defeat a thinking adversary in a complex, multi-domain battlespace. The enterprise will use all of its elements to accelerate decision-making, prototype potential solutions, rapidly integrate decision-making tools and sustain a war-winning capability by delivering multi-domain effects in, from, and through space and cyberspace enabling battle management and resilience options to "fight through."

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the DARC 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.

The FY2019 funding request was reduced by $10.000M to account for the availability of prior year execution balances.

This program 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force					Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 1206425F / *Space Situation Awareness Systems*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	10.901	34.764	39.634	0.000	39.634
Current President's Budget	9.901	34.764	39.338	0.000	39.338
Total Adjustments	-1.000	0.000	-0.296	0.000	-0.296
• 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	-1.000	0.000	-0.296	0.000	-0.296

Change Summary Explanation

FY 2017: -$1.000M Request for Additional Appropriation (RAA) back-out

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206425F / *Space Situation Awareness Systems*	Project (Number/Name) 640290 / *Deep Space Advanced Radar Concept*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
640290: *Deep Space Advanced Radar Concept*	-	9.901	34.764	39.338	0.000	39.338	29.776	43.770	97.296	158.684	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).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: DARC Technology Maturation and Prototype Development	9.901	34.764	39.338
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 FY18-FY23 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 2018 Plans: Award DARC Prototype design contracts to three developers. Conduct design through critical design review (CDR). Post CDR, use a pre-established set of down-select criteria and select one Developer to build the DARC Prototype radar. Award DARC Prototype build contract. Purchase antennas, prepare to bed down receivers and transmitters assets at the DARC Prototype site on White Sands Missile Range (WSMR). Award Integrated Systems Engineering Team (ISET) contracts to industry based on FY17 Broad Agency Announcement (BAA) competition conducted by Air Force Research Laboratory (AFRL). Continue AFRL oversight of the DARC Prototype build and initial infrastructure at the WSMR site. Develop software phase/timing software for the DARC receive and transmit subsystems. Continue program office support and other activities that may include, but are not limited to studies, technical analysis, etc.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206425F / *Space Situation Awareness Systems*	**Project (Number/Name)** 640290 / *Deep Space Advanced Radar Concept*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Continue DARC Prototype build and testing. Conduct demonstrations with the DARC Prototype radar. Prepare for and complete Material 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). Rapidly respond 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, prototyping, etc. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to 2018 by $4.592M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	9.901	34.764	39.338

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. 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 commenced in FY 2017. Broad agency announcement forms DARC Integrated Systems Engineering Team (ISET). Following CDR down-selects, DARC prototype build, test & determination will occur. DARC PoR will be a full and open industry competition.

E. Performance Metrics

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 1206425F / *Space Situation Awareness Systems*	Project (Number/Name) 640290 / *Deep Space Advanced Radar Concept*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DARC Concept Definition, Prototype Development and Analysis	Various	Various : Various	-	7.096	Sep 2017	26.467	Jan 2018	31.933	Oct 2019	-		31.933	Continuing	Continuing	-
		Subtotal	-	7.096		26.467		31.933		-		31.933	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype System and Sustainment Analyses	MIPR	AFRL : Albuquerque, NM	-	2.450	Aug 2017	4.000	Jan 2018	3.000	Jan 2019	-		3.000	Continuing	Continuing	-
		Subtotal	-	2.450		4.000		3.000		-		3.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	-	0.000		1.480	Dec 2017	1.200	Dec 2018	-		1.200	Continuing	Continuing	-
FFRDC	SS/FP	MITRE Corp : Colorado Springs, CO	-	0.347		2.757	Oct 2017	3.155	Oct 2018	-		3.155	Continuing	Continuing	-
Other Support	Various	SMC/SYG : Colorado Springs, CO	-	0.008	Sep 2017	0.060	Oct 2017	0.050	Oct 2018	-		0.050	Continuing	Continuing	-
		Subtotal	-	0.355		4.297		4.405		-		4.405	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.901		34.764		39.338		-		39.338	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206425F / *Space Situation Awareness Systems*	**Project (Number/Name)** 640290 / *Deep Space Advanced Radar Concept*

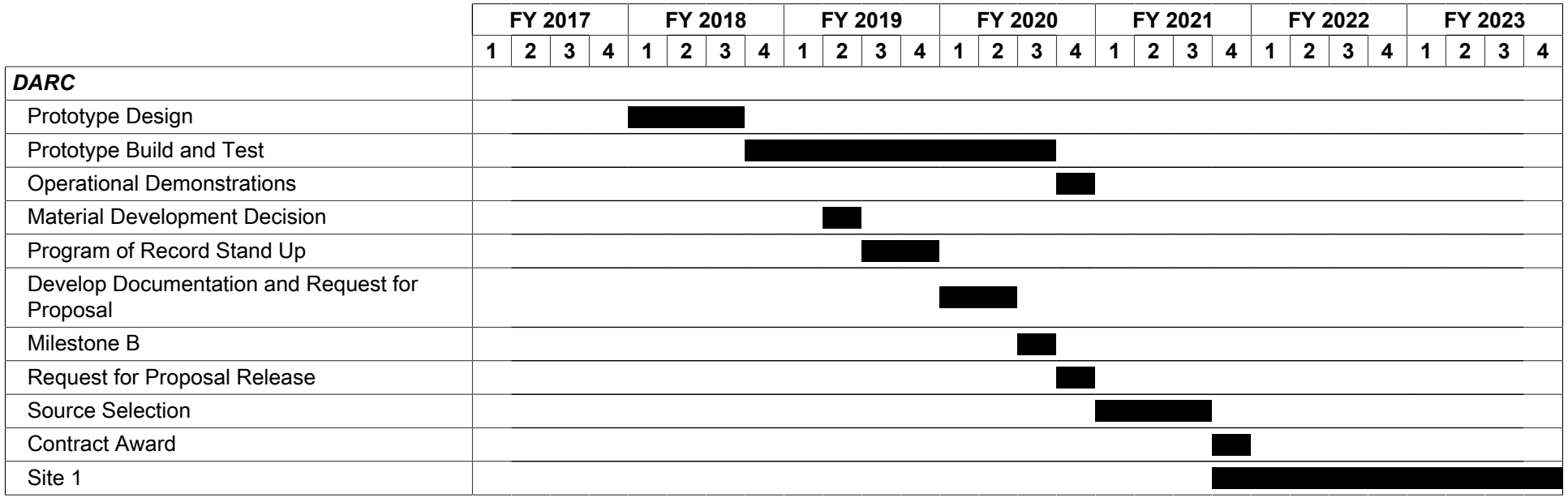

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206425F / *Space Situation Awareness Systems*	**Project (Number/Name)** 640290 / *Deep Space Advanced Radar Concept*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DARC				
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	4	2021	4	2023

Note

Site 1 estimated completion date and IOC is FY2025; IDECS will not allow for date outside of FYDP range (FY18-23)