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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 1206426F / <i>Space Fence</i>							
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	583.398	34.022	19.425	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	636.845
65A009: <i>Space Fence</i>	583.398	34.022	19.425	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	636.845
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 438												
<p><u>A. Mission Description and Budget Item Justification</u></p> <p>The Space Fence effort develops a system of ground-based sensors to improve upon the former Air Force Space Surveillance System (AFSSS), a Very High Frequency radar operational from 1961 to 2013. The Space Fence provides a more accurate and timely detection capability of smaller orbiting objects, primarily in low-earth orbit (LEO). The system uses higher frequency S-band radars at globally dispersed sites. As a result, it greatly expands the uncued detection and tracking capacity of the Space Surveillance Network, from around 20,000 to 100,000+ objects, while working in concert with other network sensors. Space Fence Radar Site-1 satisfies Initial Operational Capability (IOC) requirement and Radar Site-2 will satisfy Full Operational Capability (FOC) requirements and close the Space Situational Awareness (SSA) LEO gap for discovery and custody/tracking, and synchronize the Site-2 array size to match Site-1 to satisfy resiliency and SSA Geosynchronous Earth Orbit (GEO) sensitivity requirements. Requirements are identified in the June 2012 approved Space Fence Capabilities Development Document (CDD).</p> <p>In the FY 2019 budget, Space Fence received a Congressional rescission of \$8.000M. The correct total for FY 2018 is \$26.022M</p> <p>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.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver the Space Fence 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.</p> <p>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.</p> <p>This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.</p>												

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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	35.937	20.215	0.000	0.000	0.000	
Current President's Budget	34.022	19.425	0.000	0.000	0.000	
Total Adjustments	-1.915	-0.790	0.000	0.000	0.000	
• Congressional General Reductions	-0.665	-0.790				
• 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	-1.250	0.000				
• Other Adjustments	0.000	0.000	0.000	0.000	0.000	
Change Summary Explanation						
In the FY 2019 budget, Space Fence received a Congressional rescission of \$8.000M. The correct total for FY 2018 is \$26.022M						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
Title: Space Fence				34.022	19.425	0.000
Description: Develops S-band SSA radar system to provide detection and tracking capability of objects in Low Earth Orbit.						
FY 2019 Plans: Conduct weapon system enhancement development. Conduct Developmental Test Readiness Review (DTRR) to confirm and certify readiness to enter Developmental Test and Evaluation (DT&E). Complete 60 day Cyber Security Control Assessment. Obtain Authorization to Connect (ATC) from the Army for the Space Fence System. Complete government DT&E. Obtain Authority to Operate (ATO). Enter into and complete dedicated Initial Operational Test and Evaluation (IOT&E). Conduct Trial Period. Receive certified/verified technical orders and manuals from Original Equipment Manufacturer (OEM). Continue organic depot maintenance activation planning to execute turnover of hardware and software depot maintenance support in mid FY 2021. Complete Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). Complete government material inspection and receipt of Sensor Site 1 (SS1) and the Space Fence Operations Center (SOC). Continue preparations for the second radar site, including studies, investigations, and site surveys in support of FOC. 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, prototyping, etc. Complete commissioning of facility infrastructure and validation of facility requirements. Complete formal on-site contractor test of the system at the Kwajalein Atoll, Marshall Islands and the SOC at						

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C. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020	
the Reagan Test Site Operations Center-Huntsville (ROC-H). 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: N/A											
FY 2019 to FY 2020 Increase/Decrease Statement: N/A											
Accomplishments/Planned Programs Subtotals								34.022	19.425	0.000	
D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPAF 01 SPCFNC: <i>space fence</i>	-	46.361	71.784	-	71.784	11.291	-	-	-	0.000	129.436
Remarks											
E. Acquisition Strategy											
A single Engineering Manufacturing and Development (EMD) Production and Deployment contract was awarded on 2 June 2014 to Lockheed Martin Mission Systems and Training. The contract will take the contractor through Critical Design Review (CDR), fabrication, integration, test, production and deployment, with up to two years of Interim Contractor Support (ICS). The program will utilize a two increment approach. Increment 1/Initial Operational Capability (IOC) will consist of successful operations at the first radar site located on the Kwajalein Atoll and the Space Fence Operations Center (SOC) at Reagan Operations Center-Huntsville, AL (ROC-H). Increment 2 (contract option)/FOC will include completion of the second radar at a location to be determined pending a separate Memorandum of Agreement (MOA) decision approval and negotiations with the proposed host nation.											
F. 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.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force **Date:** February 2019

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206426F / <i>Space Fence</i>	Project (Number/Name) 65A009 / <i>Space Fence</i>
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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
Space Fence Development	C/FPIF	Lockheed Martin : Moorestown, NJ	522.697	24.269	Aug 2018	14.363	Dec 2018	-		-		-	0.000	561.329	911.115
Various (Independent Program Assessment, site survey, software, Site Activation Task Force (SATAF), Space Fence Operations Center (SOC))	Various	Various : Various	17.423	1.501	Nov 2017	0.865	Oct 2018	-		-		-	0.000	19.789	-
Space Fence Design Oversight and Management	SS/FP	MIT Lincoln Laboratory : Lexington, MA	2.788	0.480	Dec 2017	0.150	Jan 2019	-		-		-	0.000	3.418	-
Subtotal			542.908	26.250		15.378		-		-		-	0.000	584.536	N/A

Remarks

Prior to FY 2015 all funds were executed and reported in PE 0604425F (Space Situational Awareness Systems)
Product Development: \$774.994M

Test and Evaluation (\$ 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
Test - 96th Cyberspace Test Group (CTG)	PO	96th CTG : Eglin AFB, FL	4.524	2.365	Dec 2017	0.126	Mar 2019	-		-		-	0.000	7.015	-
Test - Joint Interoperability Test Command	MIPR	Joint Interoperability Test Command : Fort Huachuca, AZ	0.113	0.185	Jan 2018	0.065	Feb 2019	-		-		-	0.000	0.363	-
Subtotal			4.637	2.550		0.191		-		-		-	0.000	7.378	N/A

Remarks

Prior to FY 2015 all funds were executed and reported in PE 0604425F (Space Situational Awareness Systems)
Test and Evaluation: \$1.366M

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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	18.041	2.087	Oct 2017	2.586	Jan 2019	-		-		-	0.000	22.714	-
FFRDC	SS/FP	Various : Various	17.812	3.135	Nov 2017	1.270	Dec 2018	-		-		-	0.000	22.217	-
Subtotal			35.853	5.222		3.856		-		-		-	0.000	44.931	N/A

Remarks
 Prior to FY 2015 all funds were executed and reported in PE 0604425F (Space Situational Awareness Systems)
 Management Services: \$68.683M

	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	583.398	34.022		19.425		-		-		-	0.000	636.845	N/A

Remarks
 FINANCIAL PERFORMANCE: Space Fence is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the Space Fence System Engineering Manufacturing and Development contract is an FPIF contract with performance based payments. 11.3% of the incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force

Date: February 2019

Appropriation/Budget Activity
3600 / 5

R-1 Program Element (Number/Name)
PE 1206426F / *Space Fence*

Project (Number/Name)
65A009 / *Space Fence*

	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
<i>Space Fence</i>																												
Increment 1 EMD																												
Development Test and Evaluation																												
Initial Operational Test and Evaluation																												
Initial Operational Capability (IOC) Increment 1																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Space Fence</i>				
Increment 1 EMD	1	2018	4	2019
Development Test and Evaluation	2	2019	3	2019
Initial Operational Test and Evaluation	3	2019	3	2019
Initial Operational Capability (IOC) Increment 1	4	2019	4	2019