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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 1206730F I Space Security and Defense Program							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	30.771	32.399	41.385	0.000	41.385	45.884	46.801	47.571	48.595	Continuing	Continuing
64A025: Space Protection Program	-	30.771	32.399	41.385	0.000	41.385	45.884	46.801	47.571	48.595	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, PE 0603830F, Space Security and Defense Program efforts were transferred to PE 1206730F, Space Security and Defense Program due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 1206730F.

A. Mission Description and Budget Item Justification

This Program Element funds the DoD/Air Force component of the Space Security and Defense Program (SSDP). The SSDP is a Joint Department of Defense (DoD) and Office of the Director of National Intelligence (ODNI) organization established to function as the center of excellence for options and strategies (materiel, non-materiel, cross-Title, cross-domain) leading to a more resilient and enduring National Security Space (NSS) Enterprise. The SSDP Operates under the authority of the Deputy Secretary of Defense (DEPSECDEF) and Principal Deputy Director of National Intelligence (PDDNI) to lead and collaborate on space protection vulnerability, susceptibility, and mitigation assessments of NSS services for the purpose of identifying and introducing protection recommendations into existing requirements, budgeting, acquisition, and operational development processes. This unique mission provides an ongoing and crucial core protection competency that advances specific projects/activities (including cyber) to deliver comprehensive, economical and actionable solutions for both programmatic and operational domains.

The SSDP scope spans multiple space missions and stakeholders including the DoD, Intelligence Community (IC), civil, commercial, and international space entities that support NSS missions in both peacetime and throughout all phases of conflict. It is focused on being responsive to NSS stakeholders in providing technical and operational assessments of emergent threat concepts, and developing near- and far-term plans to address strategies, threats, and vulnerabilities. Specific SSDP Projects are structured/designed to have an impact across all time horizons; near-term focused efforts to complicate adversary operations, mid-term focused efforts to improve system and enterprise survivability, and long-term focused efforts to render adversary capabilities ineffective.

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.

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B. Program Change Summary (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget		30.771	32.399	31.481	0.000	31.481
Current President's Budget		30.771	32.399	41.385	0.000	41.385
Total Adjustments		0.000	0.000	9.904	0.000	9.904
• 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	9.904	0.000	9.904
Change Summary Explanation						
FY2018: +\$9.904M to increase analytic capability						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2016	FY 2017	FY 2018
Title: Threat Mitigation Project and Activities				25.957	0.000	0.000
Description: Entails the prioritized, project-specific technical efforts and activities supporting SSDP mission objectives. Includes associated program support/infrastructure and operating costs to sustain a coherent program effort and adhere to the legal requirements of executing a program-specific baseline.						
FY 2016 Accomplishments: FY2016 projects/activities addressed high-priority space protection issues utilizing existing processes/methodology within specific mission areas including Operations, Satellite Communication (SATCOM), Position-Navigation and Timing (PNT), Missile Warning (MW), Cyber/Non-Kinetic, Space Situational Awareness (SSA), Indications and Warning (I&W), and Intelligence - Surveillance - Reconnaissance (ISR). FY2016 projects responded to evolving protection needs and priorities throughout the NSS Enterprise; focused on meeting the demands for operational planning, ongoing coordination of Title 10/50 activities, and the advancement of specific efforts to actionable solutions that have operational and/or programmatic impact. Experimentation and CONOPS development feeding JICSpOC activities, Advanced Space Combat Tactics, Counter Network Exploitation Analysis, WGS Defense Exploration were priorities in FY2016.						
FY 2017 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
For FY2017 these activities have moved to the "Space Protection & Survivability" line to better reflect program evolution and the emphasis on integrating across enterprise level efforts, experimentation and Prototyping, and mission area specific solution development. FY 2018 Plans: N/A				
Title: Strategic Protection Activities and Products Description: Encompasses the program's strategic efforts to develop and support protection-related policy, influence and advocate for protection requirements, analyze impacts of various policy recommendations on mitigation options, and inform/assist policy-makers on opportunities to leverage policy actions to enhance the space protection posture across the NSS Enterprise. FY 2016 Accomplishments: FY16 efforts directly supported follow-on assessments identified in the FY15 Space Strategic Portfolio Review (SPR) results. Impacted policy across a broad range of DoD, IC and Civil space operations. Continued strategic protection and policy integration efforts across all facets of the NSS Enterprise. Provided technical assistance, advice and strategic solution support to enterprise stakeholders. Furthered investigation of specific tactics, technics and procedures (TTP) as well as specific cyber and materiel solutions to emergent capability needs. FY 2017 Plans: For FY2017 these activities have moved to the "Space Protection & Survivability" line to better reflect program evolution and the emphasis on integrating across enterprise level efforts, experimentation and Prototyping, and mission area specific solution development. FY 2018 Plans: N/A		3.939	0.000	0.000
Title: SATCOM Resiliency Enhancement Description: Incremental effort to enhance the ground-based software and associated operating/processing procedures used to plan WGS operations. Will leverage current system capabilities and planned software updates to improve code that will make a manually-intensive build cycle more automated/responsive. FY 2016 Accomplishments: FY2016 activities implemented Wideband Global Satcom (WGS) ground based planning enhancements as well as continued development and validation of revised techniques to support fully operationalizing the enhancement by FY2017. In order to ensure operational effectiveness, the enhancements were tested and injected into a variety of relevant exercises. The program worked to		0.875	0.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>tie-in the functions of the new software more-directly with key decision-makers and considered implementation of added features to further enhance the accuracy and effectiveness of the system to account for variables not identified/known during the original development efforts.</p> <p>FY 2017 Plans: For FY2017 these activities have moved to the “Space Protection & Survivability” line to better reflect program evolution and the emphasis on integrating across enterprise level efforts, experimentation and Prototyping, and mission area specific solution development.</p> <p>FY 2018 Plans: N/A</p>				
<p>Title: Space Protection and Survivability</p> <p>Description: SSDP organizes, plans, and executes specific projects in three focus areas: Enterprise Capabilities & Solutions; Mission Area Protection Concepts & Architectures; and Operational Tactics, Experiments & Prototypes. Enterprise Capabilities & Solutions projects focus on identifying and advocating for NSS enterprise-level protection requirements and architecture updates/modifications, informing/assisting policy-makers and analyzing policy to enhance the space protection posture across the NSS Enterprise. Mission Area Protection Concepts & Architectures projects constitute protect and defend (P&D) efforts focused on specific mission areas and/or systems. These projects entail the specific technical efforts, activities and engagements supporting capability and architecture development in mission areas such as Space Control, Battle Management Command and Control (BMC2), Satellite Communication (SATCOM), Position-Navigation and Timing (PNT), Missile Warning (MW), Space Situational Awareness (SSA), Indications and Warning (I&W), and Intelligence – Surveillance - Reconnaissance (ISR). Finally, Operational Tactics, Experiments & Prototypes projects leverage operators, experimentation and prototyping to develop, refine, document and demonstrate Tactics, Techniques and Procedures (TTPs), Concepts of Operation (CONOPS), improved operational capabilities, and associated BMC2 functions. Projects may leave behind a residual operational capability. Additionally, these projects will support development of TTPs and CONOPS for protection solutions developed by SSDP partners across the NSS Enterprise. Projects in all three areas will include cyber and non-kinetic solutions for protecting specific capabilities and the NSS Enterprise.</p> <p>FY 2016 Accomplishments: The other SSDP Major Thrusts transition into this Major Thrust in FY2017.</p> <p>FY 2017 Plans: FY2017 projects will focus on high-priority DoD & IC space protect and defend (P&D) considerations such as the Space Strategic Portfolio Review (SPR) and AFSPC Space Enterprise Vision (SEV) while being flexible and responsive to the evolving protection needs and priorities throughout the NSS Enterprise. Individual projects, both in house and in coordination with our mission partners, will work to validate candidate solutions through various means, such as technical analysis, Modeling & Simulation</p>		0.000	32.399	41.385

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>(M&S), and operator engagement. Projects will: Pursue new P&D solutions, develop CONOPS for both programmed and proposed systems, use M&S resources to mature and shape CONOPS, document architectures and inform programmatic decisions, and utilize experiment results along with M&S recommendations to influence NSS Enterprise requirement and architecture choices. Projects will include prototyping and experimenting with BMC2, SSA and Space Control concepts, planned capabilities and TTPs. Projects will be executed in SSDP facilities, mission partner facilities, and often in coordination with the Joint Space Operations Center (JSpOC), Joint Interagency Combined Space Operations Center (JICSpOC), and National Reconnaissance Operations Center (NROC). Projects will incorporate objectives to demonstrate DoD/IC space protection coordination as well as explore data fusion including the integration of commercial tools & services. SSDP will: Continue independent review and assessment for programmatic planning and architectures covering DoD, IC and Civil space operations; will engage on strategic protection and policy integration efforts across all facets of the NSS Enterprise; and will work with the NSS community to incorporate P&D requirements into policy and guidance to drive future program development and execution. M&S resources will be used to conduct architecture trades at both the enterprise and system level to identify the right mix of systems to meet NSS requirements and examine...</p> <p>FY 2018 Plans: FY2018 projects will focus on high-priority DoD & IC space protect and defend (P&D) considerations and DoD strategic evaluations on future space investments while remaining flexible and responsive to address evolving protection needs and priorities throughout the NSS Enterprise. SSDP will also further the integration of DoD & IC space protection efforts through the delivery and integration of targeted analysis, policy recommendations, and initiatives. Individual projects, both in house and in coordination with mission partners, will concentrate on validating candidate solutions through technical engineering-based analysis, modeling & simulation (M&S), and operator engagement. SSDP will pursue definitive protection solutions encompassing countermeasures, inherently resilient architectures, data fusion, and CONOPS; employing its tailored, organic M&S resources to mature and refine CONOPS, deliver conceptual protocols, evaluate architectures, assess the integration of commercial tools & services, and accomplish various Joint Space Tactics and Doctrine Forum (JSTDF) objectives. Results will inform system trades, programmatic decisions, experiment planning/design, prototyping proposals, and influence NSS Enterprise requirement and architecture choices. SSDP will additionally define and, where appropriate, execute distinctive prototypes and experiments in offensive and defensive space control (OSC & DSC) to include the Space Situational Awareness (SSA) and Battle Management Command & Control (BMC2) mission areas. The program will execute these projects, prototypes, and experiments in SSDP facilities and/or mission partner facilities; often in coordination with key space operational centers to ensure full applicability and integration with evolving operational environments and threats. Increased FY2018 funding will enable development of higher-fidelity M&S tools necessary to tie campaign level modeling to the physics-based models developed in FY2017 and earlier.</p>				
Accomplishments/Planned Programs Subtotals		30.771	32.399	41.385

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D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• NA: NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000
Remarks Note: The AF/DoD portion of the SSDP is funded entirely from this Program Element. Funding to support the complimentary/partnership National Reconnaissance Office (NRO) activities (as part of the joint/integrated program effort between AFSPC and the NRO) are programmed in the NRO classified funding request.											
E. Acquisition Strategy All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The program consists of numerous small projects.											
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: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 1206730F / Space Security and Defense Program						Project (Number/Name) 64A025 / Space Protection Program			
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Threat Mitigation Projects and Activities	Various	Various : Various	-	23.401	Nov 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Strategic Protection Activities and Products	Various	Various : Various	-	3.600	Nov 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
SATCOM Resiliency Enhancement	Various	Various : Various	-	0.875	Nov 2015	0.000		0.000		0.000		0.000	Continuing	Continuing	-
Space Protection and Survivability	Various	Various : Various	-	0.000		29.321	Nov 2016	37.057	Nov 2017	0.000		37.057	Continuing	Continuing	-
Subtotal				-	27.876		29.321			37.057		0.000		37.057	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Subtotal				-		-		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Subtotal				-		-		-		-		-	-	-	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Program Support and Infrastructure (Gov't PMA)	Various	Various : Various	-	0.999	Nov 2015	1.062	Nov 2016	1.587	Nov 2017	0.000		1.587	Continuing	Continuing	-
Oversight, Advisory and other Technical Support (Contractor PMA)	Various	Various : Various	-	1.896	Nov 2015	2.016	Nov 2016	2.741	Nov 2017	0.000		2.741	Continuing	Continuing	-

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Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 1206730F / <i>Space Security and Defense Program</i>				Project (Number/Name) 64A025 / <i>Space Protection Program</i>				

Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Subtotal			-	2.895		3.078		4.328		0.000		4.328	-	-	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	30.771	32.399	41.385	0.000	41.385	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force										Date: May 2017																			
Appropriation/Budget Activity 3600 / 4										R-1 Program Element (Number/Name) PE 1206730F / <i>Space Security and Defense Program</i>										Project (Number/Name) 64A025 / <i>Space Protection Program</i>									

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Enterprise Capabilities and Solutions																												
Mission Area Protection Concepts and Architectures																												
Operational Tactics, Experiments and Prototypes																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Enterprise Capabilities and Solutions	1	2016	4	2022
Mission Area Protection Concepts and Architectures	1	2016	4	2022
Operational Tactics, Experiments and Prototypes	1	2016	4	2022