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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force **Date:** February 2016

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305174F / <i>Space Innovation, Integration and Rapid Technology Development</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	1.999	1.543	3.070	4.715	7.785	2.957	2.623	2.673	2.721	Continuing	Continuing
67A011: <i>Space Analysis and Application Development</i>	-	1.999	1.543	3.070	4.715	7.785	2.957	2.623	2.673	2.721	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Located at Peterson AFB, Colorado, the Space Innovation, Integration and Rapid Technology Development program develops and modifies modeling and simulation tools that Air Force Space Command's Space Analysis Center uses for operations research, military utility analyses, tradeoff studies, and other evaluations of space mission areas to guide planning, programming, requirements generation, analyses of alternatives, and other activities. Development activities incorporate changes in fielded and projected space operational capabilities, as well as technical improvements, into the group's software tools to ensure their data and technology remain current. Its innovation, education, and training activities foster solutions to operational deficiencies and enhance the integration of space systems into Air Force operations, thereby enabling service and joint warfighters to realize the full potential of existing and planned space capabilities.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>
Previous President's Budget	2.071	1.543	3.129	0.000	3.129
Current President's Budget	1.999	1.543	3.070	4.715	7.785
Total Adjustments	-0.072	0.000	-0.059	4.715	4.656
• 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	-0.072	0.000			
• Other Adjustments	0.000	0.000	-0.059	4.715	4.656

C. Accomplishments/Planned Programs (\$ in Millions)

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>
Title: Model/Tool Development and Capability Upgrades	0.994	0.741	1.502	4.715	6.217

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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Description: Develops, verifies, and validates new models for space mission areas and modifies existing models to portray new capabilities. Models used by the Air Force Space Command's (AFSPC) Space Analysis Center for military utility analyses, trade studies, and other evaluations of space programs supporting program offices at the Space and Missile Center, HQ AFSPC and other activities with a space focus. Develop and modify several models and tools in support of space and cyber analysis, including, but not limited to the following: Space Surveillance Network Analysis Model (SSNAM), System Effectiveness Analysis Simulation (SEAS), System CONOPS and Requirements Environment (SCORE), Simulation of Locations and Attack of Mobile Enemy Missiles (SLAMEM), Scintillation Error Model (SCINTERR), Extended Air Defense Simulation (EADSIM), and Synthetic Theatre Operations Research Model (STORM).</p> <p>Develops changes in fielded and projected space operational capabilities, as well as technical improvements, into software tools to ensure their data and technology remain current.</p> <p>FY 2015 Accomplishments: Developed and modified several models and tools in support of space and cyber analysis.</p> <p>SSNAM - Produced 180 days of simulated data on 100,000 satellites to support JMS testing and validation.</p> <p>SEAS - Updated tool to support Warfighter Vignette Analysis efforts providing AFSPC leadership insights into the impact of space and cyberspace capabilities on military operations. Used extensively in SBIRS FO AoA for a plethora of analyses.</p> <p>EADISM, NSS, TRADIX - Upgrades/modifications supported analysis of OPIR for Missile Warning mission in SBIRS FO AoA.</p> <p>SYSTRAK, MPS - Upgrades/modifications supported analysis of OPIR for Space Situational Awareness mission in SBIRS FO AoA.</p> <p>R3 - Upgrades/modifications supported analysis of OPIR for Battlespace Awareness mission in SBIRS FO AoA.</p> <p>FY 2016 Plans: Develop and modify several models and tools in support of space and cyber analysis. Continue building on FY 2015 activities.</p>					

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
SSNAM - Continue support to JMS and support analysis for changes to the Space Surveillance Network.					
STORM - Improve space/cyber representation in STORM. Enhance STORM non-lethal effects modeling.					
SEAS - Improve space/cyber representation in STORM. Enhance STORM non-lethal effects modeling.					
SCORE - Upgrade to support Cyber/ISR studies and ITW/AA analysis.					
Other model modifications as needed based on leadership questions.					
FY 2017 Base Plans: Develop and modify several models and tools in support of space and cyber analysis. Continue building on FY 2016 activities.					
SCORE - Upgrades to support Cyber/ISR studies and ITW/AA analysis.					
SSNAM - Continue support to JMS and analysis and studies of the Space Surveillance Network.					
SEAS - Improve space/cyber representation enabling simulation of joint military force interactions utilizing these capabilities.					
STORM - Improve space/cyber representation in STORM. Enhance STORM non-lethal effects modeling.					
Other model modifications as needed based on leadership questions.					
FY 2017 OCO Plans: Jamming and Intercept Advance Notice Tool (JIANT):					
Develops defensive counterspace software tools to provide operational security/mission protection capabilities to counter near-peer investments in ground-based jammers/overhead collection assets. Provides enhanced overhead protection capability which can perform link-budget calculations to improve efficacy of collection					

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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>vulnerability warnings to deployed troops and SATCOM centric capabilities. Provides timely analysis necessary to expedite countermeasures to enemy jamming activities.</p> <p>Tiny-Tattle: Modifies software on Low Probability of Intercept/ Detection (LPI/LPD)small Size Weight and Power (SWaP)Target, Tracking and Locating (TTL) devices used via AFSPC Space/Cyber-associated tools/assets supporting Joint/SOF National Mission Force. Project exploits the investment made in other Space Command developments and provides a TTL device that works world-wide without dependencies on other platforms. Upgrades will provide increased situational awareness and assist in reducing fratricide.</p> <p>Fly Swatter: Develops prototype sensor to detect small UAVs (commercial class) via AFSPC Space/Cyber-associated tools/assets supporting Joint/SOF National Mission Force that are used by insurgents. Provides engineering level testing of prototype sensors against a range of commercially available drones capable of ISR activities or delivery of Improvised Explosive Devices. Focus on small, short range drones with Line-of-Sight communications or programed delivery.</p> <p>RADAGAST-RED: Research, development and integration of purpose built, cyber based tool(s) to remotely influence and manipulate otherwise inaccessible cyberspace systems via AFSPC Space/Cyber-associated tools/assets supporting Joint/SOF National Mission Force. Impacts adversary kill chain use in targeting, to enhance USAF expeditionary force survivability.</p> <p>Sinon Green: Research, development and integration of a tactical cyber tool designed to aid in personnel recovery via AFSPC Space/Cyber-associated tools/assets supporting Joint/SOF National Mission Force. Low-cost product with high-impact return. Enhances the survivability and availability for recovery of isolated personnel.</p> <p>Ravanna Blue: Development and integration of non-kinetic cyberspace tools designed to provide access, delivery, and persistence within complex and diverse networks. Targets medium-altitude long-endurance UAVs via AFSPC</p>					

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Space/Cyber-associated tools/assets supporting Joint/SOF National Mission Force. Scalable to other unique missions and targets.					
Title: Model Verification Description: Verification of changes made to models. FY 2015 Accomplishments: Verified model changes resulting from Model Development and Modification efforts. FY 2016 Plans: Verification of model changes resulting from Model Development and modification efforts. FY 2017 Base Plans: Verification of model changes resulting from Model Development and modification efforts.	0.435	0.324	0.657	-	0.657
Title: Model Validation Description: Validated model change results. FY 2015 Accomplishments: Validated model changes resulting from Model Development and Modification efforts. FY 2016 Plans: Validation of model changes resulting from Model Development and Modification efforts. FY 2017 Base Plans: Validation of model changes resulting from Model Development and Modification efforts.	0.570	0.478	0.911	-	0.911
Accomplishments/Planned Programs Subtotals	1.999	1.543	3.070	4.715	7.785

D. Other Program Funding Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPAF: BA03: Line Item # 834010: <i>General Information Technology</i>	1.289	1.221	1.481	0.000	1.481	0.709	0.617	0.627	0.639	Continuing	Continuing

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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
Funding and content procures equipment for the SIIRTD AFSPC Virtual Analysis Capability (AVAC) system. Supports space and cyber modeling and analysis using a variety of Linux and Windows based hardware and software suites.

E. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

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 2017 Air Force												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
3600 / 7				PE 0305174F / Space Innovation, Integration and Rapid Technology Development					67A011 / Space Analysis and Application Development							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	
Develop/modify software tools/models OCO	C/Various	Various : Various	-	0.000		0.000		0.000		4.715		4.715	Continuing	Continuing	TBD	
Develop/modify software tools/models	C/FP	Various : Various	-	0.808	Nov 2014	0.602	Nov 2015	1.220	Nov 2016	0.000		1.220	Continuing	Continuing	TBD	
Develop/modify software tools and models	C/FP	Various : Various	-	1.191	Nov 2014	0.941	Nov 2015	1.850	Jan 2016	0.000		1.850	Continuing	Continuing	TBD	
Subtotal			-	1.999		1.543		3.070		4.715		7.785	-	-	-	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			-	-		-		-		-		-	-	-	-	
Project Cost Totals			-	1.999		1.543		3.070		4.715		7.785	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force							Date: February 2016			
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	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
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	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Model development/modification, verification, and validation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Model development/modification, verification, and validation	1	2015	4	2021