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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 1206855F I Protected SATCOM Services (PSCS) - Aggregated							
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	-	0.000	0.000	16.000	0.000	16.000	214.885	348.648	549.424	930.623	Continuing	Continuing
643725: Evolved Strategic SATCOM (ESS)	-	0.000	0.000	16.000	0.000	16.000	214.885	348.648	549.424	930.623	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2018, Project 657104, MILSATCOM SMI, funds were transferred from PE 1206431F, Advanced EHF MILSATCOM (SPACE), in order to transition from MILSATCOM Space Modernization Initiative to a stand alone program.

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

The Protected Satellite Communications Services (PSCS) Analysis of Alternatives (AoA) evaluated alternative space and control segment architectures, along with the associated user segments, to address the required protected satellite communications capabilities in the nuclear, contested, and benign operating environments. The PSCS AoA Follow-on for Resiliency (PAFR) Study and Space Enterprise Vision (SEV) Strategic Tiger Team further defined the need for strategic space resiliency. To meet the requirements for strategic communications and capability gaps identified in these studies, the Evolved Strategic SATCOM (ESS) system will provide space and mission control segments for worldwide and polar DoD strategic, secure, jam-resistant, nuclear-survivable communications for ground, sea, and air assets. It will include on-board resilience features and the capability to integrate a hosted Protected Tactical Waveform (PTW) payload. PTW is a waveform designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. PTW will ensure delivery of protected tactical SATCOM to the joint and coalition warfighters in these contested, degraded environments.

ESS supports strategic mission requirements such as Presidential and National Voice Conferencing (PNVC), Nuclear Command and Control (NC2) strategic networks, terminal report back, and Emergency Action Message (EAM) dissemination. The program provides the National Command Authority (NCA) and Combatant Commanders with highly-reliable, secure MILSATCOM to execute the Single Integrated Operational Plan (SIOP), and command and control strategic forces at all levels of conflict. ESS will support 2030 strategic demand in all operational environments (nuclear, contested, and benign). It will be backwards compatible with the eXtended Data Rate (XDR) waveform and AEHF (Advanced Extremely High Frequency) satellite RF crosslinks (XL), as needed, to interface with existing AEHF space vehicles and support communication protocols associated with strategic communication services. The space vehicles will be designed to accommodate a hosted PTW payload. The ESS system will also satisfy emerging requirements and capabilities for enhanced resilience by accommodating on-board resilience payload(s), providing maneuver capability, and incorporating improved cybersecurity.

RDT&E funding is required for continued program office and other related support activities that may include, but are not limited to: architectural development, acquisition strategy development, system requirements and system trades analysis, technology maturation, risk reduction activities, system concept development, prototyping, engineering, manufacturing, developing, testing and evaluating of the ESS systems and segments.

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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.						
B. Program Change Summary (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget		0.000	0.000	0.000	0.000	0.000
Current President's Budget		0.000	0.000	16.000	0.000	16.000
Total Adjustments		0.000	0.000	16.000	0.000	16.000
• 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	16.000	0.000	16.000
Change Summary Explanation						
+\$16.000M, funds transferred from PE 1206431F, BPAC 657104 for the PSCS Aggregated effort.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2016	FY 2017	FY 2018
Title: Acquisition Strategy Development				0.000	0.000	10.938
Description: The PSCS AoA, PAFR Study, and SEV further defined the need for space resiliency. In accordance with these system concept studies and various architectures, ESS is planning market research to inform acquisition strategy development.						
FY 2016 Accomplishments: See PE 1206431, BPAC 657104						
FY 2017 Plans: See PE 1206431, BPAC 657104						
FY 2018 Plans: Mature acquisition strategy. Develop documentation necessary to comply with statutory and regulatory requirements to achieve DoD 5000.02 milestones. Partner with Industry for Technology Maturation and Risk Reduction (TMRR) contract activities. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.						
Title: Technical Baseline and Architectural Engineering				0.000	0.000	5.062

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>										<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Description:</b> ESS will support 2030 strategic demand in all operational environments (nuclear, contested, and benign), as well as supporting tactical user demands through a hostable PTW payload. As such, continued development of the technical baseline and further architecture engineering is required.  <b>FY 2016 Accomplishments:</b> See PE 1206431, BPAC 657104  <b>FY 2017 Plans:</b> See PE 1206431, BPAC 657104  <b>FY 2018 Plans:</b> Expand technical baseline development and system requirements, previously funded under the MILSATCOM Space Modernization Initiative (PE 0605431F BPAC 657104), to include the integration of a PTW payload. Conduct system architecture development within parameters of the SEV recommendations and the evolving Space Warfighter Construct (SWC). Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.												
<b>Accomplishments/Planned Programs Subtotals</b>										0.000	0.000	16.000
<b>D. Other Program Funding Summary (\$ in Millions)</b>												
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	
• RDT&E: BA05: PE 1206431F: Advanced EHF MILSATCOM (Space)	14.323	36.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	50.323	
• RDT&E: BA04: PE 1206761F: Protected Tactical Service (PTS)	0.000	0.000	24.201	0.000	24.201	176.070	140.064	7.001	69.174	Continuing	Continuing	
<b>Remarks</b>												
<b>E. Acquisition Strategy</b>												
The current cost estimates for ESS assume a full-and-open competition. Federally Funded Research Development Center (FFRDC) studies and University Affiliated Research Center (UARC) studies will assist to refine required capabilities and develop recommended architectural options prior to Milestone A in FY19.												
<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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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Air Force</b>												<b>Date: May 2017</b>			
<b>Appropriation/Budget Activity</b> 3600 / 4						<b>R-1 Program Element (Number/Name)</b> PE 1206855F / <i>Protected SATCOM Services (PSCS) - Aggregated</i>						<b>Project (Number/Name)</b> 643725 / <i>Evolved Strategic SATCOM (ESS)</i>			
<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
TMRR Preparation	TBD	Not specified. : TBD	-	0.000		0.000		4.766	Jan 2018	0.000		4.766	Continuing	Continuing	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	-	0.000		0.000		1.714	Jan 2018	0.000		1.714	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	Linquest : Los Angeles, CA	-	0.000		0.000		4.762	Jan 2018	0.000		4.762	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		0.000		11.242		0.000		11.242	-	-	-
<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-
<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
FFRDC	Various	Various : TBD	-	0.000		0.000		3.428	Jan 2018	0.000		3.428	Continuing	Continuing	-
Other Support	Various	Various : TBD	-	0.000		0.000		0.050	Jan 2018	0.000		0.050	Continuing	Continuing	-
A&AS	Various	Various : TBD	-	0.000		0.000		1.280	Jan 2018	0.000		1.280	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		0.000		4.758		0.000		4.758	-	-	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Air Force</b>										<b>Date:</b> May 2017			
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 1206855F / <i>Protected SATCOM Services (PSCS) - Aggregated</i>					<b>Project (Number/Name)</b> 643725 / <i>Evolved Strategic SATCOM (ESS)</i>			
	<b>Prior Years</b>	<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	-	0.000		0.000		16.000		0.000		16.000	-	-	-
<b>Remarks</b>													

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> FY 2018 Air Force												<b>Date:</b> May 2017			
<b>Appropriation/Budget Activity</b> 3600 / 4						<b>R-1 Program Element (Number/Name)</b> PE 1206855F / <i>Protected SATCOM Services (PSCS) - Aggregated</i>						<b>Project (Number/Name)</b> 643725 / <i>Evolved Strategic SATCOM (ESS)</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
Release Technology Maturation and Risk Reduction (TMRR) Request for Proposal (RFP)																												
Source Selection																												
Milestone A Decision																												
Contract Award																												
Preliminary Design Review (PDR)																												
Milestone B Decision																												
TMRR Phase																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Air Force			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206855F / <i>Protected SATCOM Services (PSCS) - Aggregated</i>	<b>Project (Number/Name)</b> 643725 / <i>Evolved Strategic SATCOM (ESS)</i>	

**Schedule Details**

<b>Events</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
Release Technology Maturation and Risk Reduction (TMRR) Request for Proposal (RFP)	3	2018	3	2018
Source Selection	3	2018	2	2019
Milestone A Decision	1	2019	1	2019
Contract Award	2	2019	2	2019
Preliminary Design Review (PDR)	4	2020	4	2020
Milestone B Decision	3	2021	3	2021
TMRR Phase	2	2019	4	2021