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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force										Date: February 2018		
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 1206761F I Protected Tactical Service (PTS)							
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	-	0.000	24.201	29.776	0.000	29.776	173.694	253.392	263.096	461.058	Continuing	Continuing
643728: Protected Tactical SATCOM	-	0.000	24.201	29.776	0.000	29.776	173.694	253.392	263.096	461.058	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The centerpiece of the Protected Tactical SATCOM (PTS) system is a new, more resilient Protected Tactical Waveform (PTW), designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. The DoD will be implementing PTW to ensure delivery of protected tactical SATCOM to the joint and coalition warfighters in contested, degraded environments. The Protected Tactical Service Field Demonstration (PTSFD) is paving the way for the operationalization of PTW by developing production-representative PTW modems that can be used by the Services to upgrade their currently fielded terminals. In conjunction, the Protected Tactical Enterprise Service (PTES) program is developing a mission management, key management and hub system to enable PTW via transponded Wideband Global SATCOM (WGS) satellites, with future extension to commercial SATCOM and PTS.

PTS will provide worldwide, fully processed, beyond line of sight, Anti-Jam (AJ), low probability of intercept communications to tactical warfighters in both benign and contested environments via space-based fully processed SATCOM payloads. PTS will leverage the mission management and key management systems developed under the PTES program for mission planning, and will deliver a PTS ground architecture capable of integrating with PTES ground. PTS, with its on-board payload processing and antenna design, will bring advanced anti-jam capability and increased capacity. The system will also employ interfaces consistent with AFSPC's ongoing resilience initiatives and Enterprise Ground Services; thereby enhancing mission assurance, resiliency, and interoperability.

PTS will address the protected tactical MILSATCOM capability gaps identified in the Joint Space Communications Layer Initial Capabilities Document (JSCL ICD), the Protected Satellite Communications Services (PSCS) Analysis of Alternatives (AoA), and in the PSCS AoA Follow-on for Resiliency (PAFR). To meet the warfighter requirements for protected tactical MILSATCOM and the capability gaps identified in these studies, PTS will carry out essential Technology Maturation and Risk Reduction (TMRR) activities requiring RDT&E funding to evaluate and develop system requirements, architectures, prototypes, development efforts, engineering efforts, and manufacturing efforts. Additionally, RDT&E funding is needed to mature technology, reduce risks, and conduct testing and evaluation of PTS systems and segments, to include space, ground, and terminal/user segments.

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."

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Protected Tactical Service (PTS) 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.						
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 as high fidelity and realistic operating environment.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		0.000	24.201	176.070	0.000	176.070
Current President's Budget		0.000	24.201	29.776	0.000	29.776
Total Adjustments		0.000	0.000	-146.294	0.000	-146.294
• 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	-146.294	0.000	-146.294
Change Summary Explanation						
FY 2019: -\$146.294M: -\$146.070M to align funding profile to a program office estimate based on a one year PTS launch delay from 2027 to 2028, -\$0.224M inflation adjustment						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: Acquisition Strategy Development & Source Selection				0.000	14.828	7.054
Description: The PSCS AoA, PAFR study, and Space Warfighting Construct further defined the need for a more resilient, protected tactical space architecture with increased capacity. In accordance with these system concept and architecture studies, the PTS program is developing its acquisition strategy to include hostable payloads, free-flyers, on-orbit pathfinders, and other options.						
FY 2018 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019	
Mature competitive acquisition strategy. Develop documentation necessary to comply with statutory and regulatory requirements to achieve DoD 5000.02 milestones. Plan to finish acquisition strategy and complete DoD acquisition approval. Plan to conduct source selection for one or more contractors for risk reduction and prototyping of the PTS system.  <b>FY 2019 Plans:</b> Continue to develop documentation necessary to comply with statutory and regulatory requirements to achieve DoD 5000.02 milestones and approval. Plan to complete acquisition strategy approval. Release TMRR RFP to industry. Conduct source selection for one or more contractors for competitive prototyping, technology maturation, and risk reduction efforts. Continue program office support and other related support activities.  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> FY2019 decreased compared to FY2018 by \$7.774M. Justification for this is described in plans above.											
<b>Title:</b> Technical Baseline and Architectural Engineering  <b>Description:</b> Conduct architectural engineering and associated trades required for the PTS space and ground segments.  <b>FY 2018 Plans:</b> Develop technical baseline and system requirements. Conduct system architecture and trade analyses, conduct risk reduction activities.  <b>FY 2019 Plans:</b> Continue studies for constellation architectural design. Continue to develop and mature system requirements. Continue analyses on system design/trade-offs and affordability trades. Continue to develop technical baseline products, including system engineering and integration plans. Prepare for award and execution of TMRR. 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 program office support, studies, technical analysis, prototyping, etc.  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> FY2019 increased compared to FY2018 by \$13.349M. Justification for this is described in plans above.								0.000	9.373	22.722	
Accomplishments/Planned Programs Subtotals								0.000	24.201	29.776	
D. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• RDTE 04 PE 1206855F: PSCS Aggregated	0.000	16.000	29.379	-	29.379	172.206	206.247	301.617	537.124	Continuing	Continuing

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<b>D. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<b>Remarks</b>  <b>E. Acquisition Strategy</b> The PTS team is developing an acquisition strategy which will be informed by market research to identify industry capabilities and acquisition concepts. This strategy will have an early emphasis on payload development and hosting opportunities and will incorporate lessons learned from MILSTAR, AEHF, PTES and commercial SATCOM practices.											
<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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
3600 / 4						PE 1206761F / Protected Tactical Service (PTS)				643728 / Protected Tactical SATCOM					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Protected Tactical SATCOM TMRR System Design/Tradeoff studies and analyses	Various	Various : Various	-	-		8.235	Jan 2018	12.545	Jan 2019	-		12.545	Continuing	Continuing	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	-	-		4.891	Jan 2018	4.220	Nov 2018	-		4.220	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	-		6.624	Jan 2018	7.571	Jan 2019	-		7.571	Continuing	Continuing	-
Subtotal			-	-		19.750		24.336		-		24.336	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
FFRDC	MIPR	Aerospace : El Segundo, CA	-	-		2.465	Jan 2018	2.465	Nov 2018	-		2.465	Continuing	Continuing	-
Other Support	Various	Various : Various	-	-		0.050	Jan 2018	0.050	Nov 2018	-		0.050	Continuing	Continuing	-
A&AS	Various	Various : Various	-	-		1.936	Jan 2018	2.925	Jan 2019	-		2.925	Continuing	Continuing	-
Subtotal			-	-		4.451		5.440		-		5.440	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		24.201		29.776		-		29.776	Continuing	Continuing	N/A
Remarks															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2019 Air Force			<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 3600 / 4		<b>R-1 Program Element (Number/Name)</b> PE 1206761F / <i>Protected Tactical Service (PTS)</i>			<b>Project (Number/Name)</b> 643728 / <i>Protected Tactical SATCOM</i>

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
<b><i>Hostable Protected Tactical PL</i></b>																												
Protected Tactical SATCOM Materiel Development Decision																												
Develop Architecture, Technical Baseline and Acquisition Strategy																												
Milestone A Decision																												
Release Technology Maturation and Risk Reduction (TMRR) Request for Proposal																												
TMRR Source Selection																												
TMRR Contract Award																												
TMRR Phase																												
PTS Pathfinder																												

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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 1206761F / Protected Tactical Service (PTS)	Project (Number/Name) 643728 / Protected Tactical SATCOM	

## Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Hostable Protected Tactical PL</b>				
Protected Tactical SATCOM Materiel Development Decision	4	2017	4	2017
Develop Architecture, Technical Baseline and Acquisition Strategy	1	2018	1	2019
Milestone A Decision	1	2019	1	2019
Release Technology Maturation and Risk Reduction (TMRR) Request for Proposal	2	2019	2	2019
TMRR Source Selection	2	2019	2	2020
TMRR Contract Award	2	2020	2	2020
TMRR Phase	2	2020	4	2022
PTS Pathfinder	3	2022	2	2023