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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 1206760F I Protected Tactical Enterprise Service (PTES)							
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	-	17.552	46.419	105.003	0.000	105.003	123.841	112.720	56.806	57.828	Continuing	Continuing
643726: PTES	-	17.552	46.419	105.003	0.000	105.003	123.841	112.720	56.806	57.828	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The global threat of electronic warfare attacks against space systems will expand in the coming years in both number and types of weapons. Threat development will very likely focus on jamming capabilities against dedicated military satellite communications (MILSATCOM). To address this critical need, the Air Force is developing the Protected Tactical Enterprise Service (PTES) ground system to provide worldwide, anti-jam, Low Probability of Intercept (LPI) communications for tactical warfighters. PTES will utilize the Protected Tactical Waveform (PTW) to provide anti-jam communications via military and commercial satellite systems for tactical users in all Services. Initially, PTES will utilize the Wideband Global SATCOM (WGS) system and be expanded later to include commercial satellites and the Protected Tactical SATCOM (PTS) system.

The PTES program is developing a mission management system (MMS), a key management system (KMS) and hub system to enable PTW via transponded WGS satellites, with future extension to commercial SATCOM. Production-representative PTW modems for user terminals are being developed by the Protected Tactical Service Field Demonstration (PTSFD) and will be separately acquired by each Service and by international partners.

To meet the warfighter requirements for protected tactical MILSATCOM and the capability gaps identified in these studies, RDT&E funding is required for architectural development, acquisition strategy development, system requirements and system trades analysis, and engineering, manufacturing, developing, testing and evaluating PTES systems and segments.

The PTES rapid prototype addresses an urgent operational need in the Pacific region by achieving Initial Operational Capability (IOC) in 2023. IOC provides ground elements for PTW over WGS and consists of PTES installation at two WGS Gateway sites utilizing one WGS satellite. The Navy Wideband Anti-Jam Modem System (WAMS) relies on PTES to provide PTW ground infrastructure. The Air Force is utilizing FY 2016 National Defense Authorization Act, Section 804, Middle Tier of Acquisition for Rapid Prototyping authority to deliver a PTES Early Operations Capability meeting the Navy's Minimum Viable Product in 2022. At Full Operational Capability (FOC) PTES will provide worldwide PTW operations using up to all WGS satellites.

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.

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver PTES 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.							
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.							
This effort 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	
Previous President's Budget		18.150	51.419	105.003	0.000	105.003	
Current President's Budget		17.552	46.419	105.003	0.000	105.003	
Total Adjustments		-0.598	-5.000	0.000	0.000	0.000	
• Congressional General Reductions		0.000	0.000				
• Congressional Directed Reductions		0.000	-5.000				
• 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		-0.598	0.000				
• Other Adjustments		0.000	0.000	0.000	0.000	0.000	
Change Summary Explanation							
FY 2019: -\$5.000M Congressional Directed Reduction due to schedule slip.							
C. Accomplishments/Planned Programs (\$ in Millions)					FY 2018	FY 2019	FY 2020
Title: Acquisition Strategy Development					15.307	0.000	0.000
Description: The Joint Space Communications Layer Initial Capabilities Document and the Protected Satellite Communications Services Analysis of Alternatives defined the need for a more resilient, protected tactical architecture with increased capacity and bandwidth. In accordance with these requirements, the PTES program will develop an acquisition strategy to meet the required capabilities within an acceptable cost and schedule.							
FY 2019 Plans:							

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
N/A. FY 2020 Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: N/A				
Title: Source Selection & Contract Award Description: Competitively award a single contract to develop and field PTES, including declaration of IOC and FOC. The contractor will be responsible for developing all PTES segments and performing all system integration, including end-to-end tests of the complete PTES system. FY 2019 Plans: N/A. FY 2020 Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: N/A		2.245	0.000	0.000
Title: PTES Prototype Development Description: This major thrust was formerly known as PTES System Development. After competitive contract award, the PTES team will develop a prototype consisting of three segments: a MMS, a KMS, and Joint Hubs integrated into existing SATCOM gateways. PTES will enable an anti-jam communications capability via PTW over WGS for tactical users in all Services and International Partners. The PTES team will be responsible for developing all PTES segments and performing all system integration, including end-to-end tests of the complete PTES prototype. FY 2019 Plans: Award and execute the PTES contract. Purchase and provide Government Furnished Equipment to PTES Contractor. Evaluate results of Protected Tactical Service Field Demonstration (PTSFD) testing and incorporate lessons learned. 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:		0.000	46.419	105.003

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Continue PTES Prototype Development. Plan, develop, test and deliver the MMS, KMS, and Key Loading Initialization Facility (KLIF) Build 1 software for Government PTES Program Office testing on the Defense Information System Agency (DISA) Core Data Center environment. Conduct Risk Reduction Demonstration and Risk Reduction Test for Build 1. 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, experimentation, prototyping, etc.				
FY 2019 to FY 2020 Increase/Decrease Statement: FY2020 increased compared to FY2019 by \$58.584M. Justification for this increase is described in plans above.				
Accomplishments/Planned Programs Subtotals		17.552	46.419	105.003
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks Associated WAMS funding is contained within Navy Multiband Terminal (NMT) program.				
E. Acquisition Strategy PTES was designated as a rapid prototype in June 2018 under section 804 of the National Defense Authorization Act for Fiscal Year 2016 (Public Law 114-92). The objective of the PTES ground system is to provide an operational anti-jam communications capability via WGS using PTW. The PTES acquisition approach is to competitively award a single contract to develop and field PTES, through declaration of IOC. The contractor will be responsible for developing all PTES segments (MMS, KMS, and Hub) and performing all system integration, including end-to-end tests of the complete PTES prototype. The 45th Test Squadron is planned to be the PTES Developmental Test organization and AFOTEC is planned to be the Operational Test organization.				
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 / 4						R-1 Program Element (Number/Name) PE 1206760F / Protected Tactical Enterprise Service (PTES)				Project (Number/Name) 643726 / PTES					
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
Protected Tactical Enterprise Service Prototype Development	C/CPIF	Boeing : El Segundo, CA	-	2.495	Nov 2018	20.159	Nov 2018	72.527	Oct 2019	-		72.527	Continuing	Continuing	-
Core Data Center	MIPR	DISA : Pensacola, FL	-	0.820	Jan 2018	4.000	Dec 2018	4.000	Oct 2019	-		4.000	Continuing	Continuing	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	-	2.966	Jan 2018	4.497	Dec 2018	4.296	Oct 2019	-		4.296	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	7.315	Jan 2018	8.402	Dec 2018	9.928	Oct 2019	-		9.928	Continuing	Continuing	-
Subtotal			-	13.596		37.058		90.751		-		90.751	Continuing	Continuing	N/A
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 Planning & Execution DT/OT	Various	Various : Various	-	0.294	Jan 2018	2.167	Dec 2018	2.720	Oct 2019	-		2.720	Continuing	Continuing	-
Subtotal			-	0.294		2.167		2.720		-		2.720	Continuing	Continuing	N/A
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
FFRDC	MIPR	Aerospace : El Segundo, CA	-	1.576	Jan 2018	2.421	Dec 2018	2.417	Oct 2019	-		2.417	Continuing	Continuing	-
A&AS	Various	Various : Various	-	2.014	Jan 2018	4.573	Dec 2018	8.915	Oct 2019	-		8.915	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.072	Jan 2018	0.200	Oct 2018	0.200	Oct 2019	-		0.200	Continuing	Continuing	-
Subtotal			-	3.662		7.194		11.532		-		11.532	Continuing	Continuing	N/A

UNCLASSIFIED

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			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			-	17.552		46.419		105.003		-		105.003	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force			Date: February 2019		
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	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
PTES																												
Conduct Source Selection																												
Award Development Contract																												
PTES Prototype Development																												
Software Build 1																												
Software Build 2																												
Software Build 3																												
Early Ops Capability (Navy Minimum Viable Product)																												
Software Build 4																												
Software Build 5																												
IOC																												
Software Build 6																												
Software Build 7																												
Developmental/Operational Testing (to include Planning)																												

UNCLASSIFIED

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
PTES				
Conduct Source Selection	2	2018	1	2019
Award Development Contract	1	2019	1	2019
PTES Prototype Development	1	2019	4	2024
Software Build 1	4	2019	3	2020
Software Build 2	3	2020	2	2021
Software Build 3	2	2021	1	2022
Early Ops Capability (Navy Minimum Viable Product)	1	2022	1	2022
Software Build 4	1	2022	4	2022
Software Build 5	4	2022	3	2023
IOC	3	2023	3	2023
Software Build 6	3	2023	2	2024
Software Build 7	2	2024	4	2024
Developmental/Operational Testing (to include Planning)	1	2018	4	2024

Note

FOC occurs outside FYDP