

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206761SF I Protected Tactical Service (PTS)
---	---

COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	221.355	252.078	360.126	0.000	360.126	348.387	345.422	464.180	482.389	0.000	2,473.937
643728: Protected Tactical SATCOM	-	221.355	252.078	360.126	0.000	360.126	348.387	345.422	464.180	482.389	0.000	2,473.937
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 (SATCOM). To address this critical threat, and in pursuit of more precise solutions for disaggregated strategic and tactical SATCOM, U.S Strategic Command (USSTRATCOM) and Air Force Space Command (AFSPC) initiated the Protected Anti-jam Tactical SATCOM (PATS) family-of-systems. The PATS integrated approach includes the Protected Tactical Satellite Communications (PTS) and Protected Tactical Enterprise Service (PTES) programs to mitigate adversarial jamming effects by using the Protected Tactical Waveform (PTW). The PTS program is the disaggregated tactical communications follow-on to the Advanced Extremely High Frequency (AEHF) program. The United States Space Force (USSF) is developing the PTS system to provide tactical users increased protection with worldwide and polar, beyond-line-of-sight, Anti-Jam (AJ), low-probability-of-intercept communications in benign and highly-contested anti-access/area denial environments utilizing the PTW. The PTS system's on-board payload/signal processing, antenna design, and advanced beam-forming using a distributed, diversified, and agile constellation of hostable payloads and high capacity free-flyers enables reliable tactical SATCOM within close proximities to adversarial jammers. The system also employs interfaces consistent with USSF's on-going resilience initiatives enhancing mission assurance and interoperability. The program's modular, flexible, scalable, and protected tactical payload constellation architecture will increase resiliency through distribution across a larger number of space platforms (e.g., hostable, free-flyer, international partnerships). The PTES program (PE 1206760SF, Project 643726) establishes the ground infrastructure for PTS, which operationalizes the PTW.

For the initial PTS phase, USSF is utilizing FY 2016 National Defense Authorization Act (NDAA), Middle Tier of Acquisition (MTA) for Rapid Prototyping (RP) authority and Section 815, Other Transaction Authority (OTA), to achieve an affordable, rapid, operational capability for the tactical warfighter. This strategy employs rapid payload development to progressively and incrementally deploy prototypes with residual capabilities demonstrated in an operational environment. These RP payloads demonstrate innovative AJ technologies with modular and scalable payloads to meet validated military needs for protected tactical communications. This includes technical baseline development, systems engineering trade analyses, internal/external system integration and development, candidate system architecture evaluations, risk reduction demonstrations, prototyping concepts development, system testing, and enabling technologies maturation. The PTS Engineering, Manufacturing, and Development (EMD) Phase will follow the PTS RP Phase to develop purpose-built "hub in space" satellites with full signal processing and switching capability that allows direct connectivity between users.

The PTS RP and EMD Phases include a Space Segment, Ground Segment, and Gateway Segment. For the Space Segment, the USSF strategy utilizes a payload-centric focus to enable an affordable, resilient space architecture. This enables hosting and rideshare opportunities with other US government, commercial, International Partner (IP) satellites or integration onto a commodity satellite bus. For the Ground Segment, PTS develops satellite command and control and leverages the PTES RP

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>
---	--

activity for mission and key management planning. The PTS Gateway Segment enables tactical warfighters reach back to global DoD Information Network. The PTS user Terminal Segment, not included in this PTS acquisition, will be procured by the military services utilizing low-cost PTW modem upgrades enabled by the Air Force-Army Anti-Jam Modem (A3M) ACAT III program and the Navy Wideband Anti-Jam Modem System (WAMS) technology demonstration program. PTS also develops the National Security Agency (NSA)-certified and space-flight qualified production-ready Space Hub End Cryptographic Unit (ECU). Starting the ECU as a single, early risk-reduction effort targets a high-risk area of the PTS development and enables PTS program success.

Space acquisition must respond with speed and agility to pacing and emerging adversary threats. Space System Command (SSC) has transformed 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, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver PTS weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

The total cost of the PTS RP Middle Tier of Acquisition effort is \$970.6 million. The PTS RP program is fully funded across the Future Years Defense Program. PTS activities are projected to be designated as Major Capability Acquisition programs in FY24.

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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	229.329	294.828	360.442	0.000	360.442
Current President's Budget	221.355	252.078	360.126	0.000	360.126
Total Adjustments	-7.974	-42.750	-0.316	0.000	-0.316
• Congressional General Reductions	0.000	-0.750			
• Congressional Directed Reductions	0.000	-42.000			
• 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	-7.974	0.000			
• Other Adjustments	0.000	0.000	-0.316	0.000	-0.316

Change Summary Explanation

FY 2022: -\$7.974M SBIR/STTR Transfer

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>
---	--

FY 2023: -\$42.000M Congressional Mark
 FY 2023: -\$0.750M Congressional General Reduction
 FY 2024: -\$1.928M to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity, +\$1.612M inflation adjustment

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

	FY 2022	FY 2023	FY 2024
<p>Title: PTS Rapid Prototype (RP) Design and Development</p> <p>Description: Rapid prototyping of the PTS Space Segment for two PTS RP payloads and payload and bus command and control (C2) development/upgrades at the operating centers for the Ground Segment. Develop, demonstrate, test, and evaluate PTS hardware/software systems and key system components. Design and develop modular, scalable payloads to support hosted or free-flyer configurations. Includes integration to host vehicle or purchase of a bus for free-flier configuration. Demonstrate prototype payload on-orbit performance. Evaluate PTS concept of operations with user participation and enable potential residual operational capability. Mature and validate user requirements. Support development, risk reduction efforts, and integration of PTS to deliver two prototype payloads available for launch in FY 2024, one as a hosted payload and one as a free-flyer.</p> <p>FY 2023 Plans: Continue build, integration and testing for two competing prototype payloads. Complete prototype payload build, integration and testing. Continue build and integration of government furnished software and hardware. Continue development, build, integration and test/demonstrations of ground and gateway terminal with payload prototypes to reduce system level risk, to include Mission Management System (MMS) and Key Management System (KMS) upgrades and Command and Control (C2)/Gateway development. Begin payload to space vehicle integration and testing. Conduct space vehicle to launch vehicle integration studies/coordination. Begin the next phase of the PTS effort to competitively award to one contractor. Continue Engineering and Manufacturing Development (EMD) Phase acquisition planning. Receive approval of EMD Acquisition Strategy and permission to release Request for Proposal. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to; program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 Plans: Continue prototyping and risk reduction efforts. Conduct final build, integration, and test activities to complete two PTS prototype payloads to be available for launch in FY 2025 as payloads on Boeing's WGS-11 (hosted) and Northrup Grumman Corporation (NGC)'s ESPASar-HP satellites (free-flyer). Conduct cybersecurity testing and receive interim authorization to test (IATT). Conduct payload to space vehicle integration and testing. Conduct space vehicle to launch vehicle integration for two PTS RP payloads. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space</p>	185.807	188.619	73.417

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
domain. Activities include, but are not limited to; program office support, studies, technical analysis, experimentation, prototyping, etc. FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decreased due to the completion of two PTS RP payloads design and development, and transferring activity out of this Major Thrust into new Major Thrusts for PTS Ground Segment development, PTS Gateway Segment development, and EMD Phase.				
Title: PTS RP Space Hub End Cryptographic Unit (ECU) Description: Develop a single, National Security Agency (NSA) certified, space-flight qualified, production-ready Space Hub ECU for integration with the PTS payloads. Conduct and design development to alleviate critical path risks to the launch of PTS payloads. Conduct requirements reviews, functional and design reviews, PTS interface development, Interface Control Document (ICD) coordination, and payload integration with PTS vendors. FY 2023 Plans: Continue ECU build and final testing of flight-ready production units to receive NSA certification and then deliver ECU to payload contractors for integration. Support ECU design/certification activities with the NSA to deliver a certified ECU, to include conducting quick-reaction troubleshooting/deficiency resolution for ECU during payload integration. FY 2024 Plans: Conduct quick-reaction troubleshooting/deficiency resolution for ECU during final integration and test of two PTS prototype payloads. FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased to support ECU integration into PTS payload and deficiency resolution during testing.		6.110	3.418	5.757
Title: PTS RP Ground Development Description: This is not a New Start but a segregated effort started under the PTS Rapid Prototype Design and Development Major Thrust. Develops and incorporates MMS/KMS modifications of the PTES program ground capability to plan and manage PTS, the associated cryptographic material and the SATCOM links they enable. Also develops and incorporates modifications to mission management systems of the WGS program ground capability (i.e. Common Network Planning Software (CNPS) and Wideband SATCOM Trend Analysis and Anomaly Resolution System (WSTARS)). FY 2023 Plans: FY 2023 plans were previously included in the PTS Rapid Prototype Design and Development Major Thrust. FY 2024 Plans:		0.000	0.000	18.257

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Continue MMS/KMS upgrades to modify PTES Ground Segment to conduct PTS prototype payload MMS/KMS for on-orbit operations. Conduct integration and testing between the payloads and the PTES MMS/KMS, interoperability/interface and control of the ECU to the Payload, and compatibility with PATS user terminals. Support integration and testing by quickly responding with troubleshooting and deficiency resolution. Continue development, modifications, and integration of the WGS CNPS planning system and the WSTARS, which provides the overarching management of all sub-systems, providing situational awareness to all users of the Wideband SATCOM Operations Management System (WSOMS).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased due to ramp up of PTES modifications to be ready for launch of PTS prototype at the end of FY 2024, as part of the PTS RP Design and Development.</p>				
<p>Title: PTS RP Gateway Development</p> <p>Description: This is not a New Start but a segregated effort started under the PTS Rapid Prototype Design and Development Major Thrust. Develop the Gateway Segment, also called PTS Ground Entry Terminal-Prototype (PGET-P), for integration with the PTS system. Conduct requirements reviews, functional and design reviews, PTS interface development, and Interface Control Document (ICD) coordination, and integration with PTW modems (i.e. A3M and WAMS)</p> <p>FY 2023 Plans: FY 2023 plans were previously included in the PTS Rapid Prototype Design and Development Major Thrust.</p> <p>FY 2024 Plans: Conduct integration and test of PGET prototype. Conduct integration and test/demonstrations with PTW modems and payload prototypes to reduce system level risk. Deliver and install at site location in preparation for prototype payload launch.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased due to ramp up of final integration and test activities, delivery and install of PGETs to site locations for two PTS prototype payloads, as part of the PTS RP Design and Development.</p>		0.000	0.000	5.420
<p>Title: PTS Engineering and Manufacturing Development (EMD) Phase</p> <p>Description: This is not a New Start but continues follow-on EMD Phase activities associated with providing full PTS on-orbit capability previously included in the PTS RP Design and Development Major Thrust. Includes EMD Phase acquisition planning to develop, build, test, and evaluate the next iteration of the PTS EMD Phase Payloads to support hosted or free-flyer configurations. Includes efforts to develop the Space, Ground, and Gateway Segments, as well as the Space Hub ECU. Initiate EMD phase of PTS space, ground, and gateway segments and key system components. Develop, build, test, and evaluate next PTS payloads to support hosted or free-flyer configurations available for launch in FY 2028 and FY 2029. Includes payload and bus control</p>		-	0.000	161.252

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
development/upgrades at the operating centers. Deliver Initial Operational Capability (IOC) for protected communications against threats in FY 2030 with operational payloads. Continue to mature PTS concept of operations with user participation.				
FY 2023 Plans: FY 2023 plans were previously included in the PTS Rapid Prototype Design and Development Major Thrust.				
FY 2024 Plans: Award up to two payload contracts to begin design of PTS EMD Phase Payloads available for launch in FY 2028 and FY 2029 following acquisition planning efforts begun in FY 2023 previously included in the PTS RP Design and Development Major Thrust. Conduct design and development of next PTS payloads to support hosted or free-flyer configurations. Includes integration to host vehicle or purchase of a bus for free-flier configuration. Develop, demonstrate, test, evaluate, and purchase PTS hardware and software systems. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.				
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased to reflect transfer of PTS development from Middle Tier Acquisition - RP (MTA-RP) to Major Capability Acquisitions (MCA) pathway and the awarding of EMD phase contracts.				
Title: Protected Tactical Testbed		8.742	21.510	11.740
Description: Protected Tactical Testbed provides a government gold standard of reference for risk reduction and experimentation on critical technology elements for the space payload, terminals and networking segments of the PATS system. It enables system integration capabilities with industry and FFRDC partners for interoperability testing and conducting experiments to mature the PATS operations, with a focus on the PTW. Supports the PTS RP and EMD Phases.				
FY 2023 Plans: Demonstrate interoperability between the Payload and the PTES MMS, interoperability/interface and control of the ECU to the Payload, and compatibility with PATS user terminals. Conduct PTW Lead Service duties to demonstrate that PTW will support the department's Core Waveform program, to include verification of the PTW modem interoperability with the joint force. Joint SATCOM Engineering Center (JSEC) executes and enables critical testing activities for prototype payload contractors. Ensures the development process and impending product adhere to the tenets defined by the established requirements. Continue multi-service development of PATS user terminals (A3M and Navy WAMS) and final development stages of the PTES delivery. Continue use in outreach efforts to potential coalition partners and other emerging users to demonstrate capability using their space, ground, and user terminal assets.				
FY 2024 Plans:				

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Continue to demonstrate interoperability between the PTS payload and the PTES MMS, interoperability/interface and control of the ECU to the PTS payload, and compatibility with PATS user terminals. Continue PTW Lead Service duties to demonstrate that PTW will support the department's Core Waveform program, to include verification of the PTW modem interoperability with the joint force. JSEC executes and enables critical testing activities for prototype payload contractors. Ensures the development process and impending product adhere to the tenets defined by the established requirements. Continue multi-service development of PATS user terminals A3M and Navy WAMS and final development stages of the PTES delivery. Continue use in outreach efforts to potential coalition partners and other emerging users to demonstrate capability using their space, ground, and user terminal assets.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decreased due to reduced JSEC cost-share requirements with other PATS segments.</p>				
<p>Title: Technical Baseline Management, System Integration and Test Support</p> <p>Description: Perform as Government system integrator function through acquiring, designing, testing, and integrating key segments and interfaces. Mature technical baseline and interface requirements for the system. Conduct architectural engineering and system level integration planning supporting the PTS RP and EMD Phases for the Space, Ground, and Gateway Segments. Support, configure, and conduct integrated testing of the major PTS subsystems, segments, and end-to-end system, to include supporting testing conducted by the 96th Test Wing (TW). Manage the PTS open system architecture, refine interface requirements, and validate concept of operations through integrated system performance demonstrations.</p> <p>FY 2023 Plans: Continue prototype capability development and interface maturity demonstrations of two prototype payloads. Incorporate critical lessons from demonstrations into maturation and refinement of the technical baseline and system architecture. Engineering trades identified during ongoing progress demonstrations will continue to provide the necessary mitigation steps for program risks. Continue to manage key system interfaces for prototype Ground, Space, and Gateway Segments. Conduct Lead System integration and test for these components, along with the Space Hub ECU interfaces to the prototype payload contractors. Conduct key interface tests between the PTS prototype and emulators/simulators to reduce risk to PATS level integration with PTES and other partner programs. Continue testing, characterizing, and demonstrating anti-jam communication capabilities. Continue Ground CONOPS architecture development. Begin coordinating with national and international agencies for orbital slots and frequency allocation. Conduct launch planning and activities to include Space Vehicle (SV) and Launch Vehicle (LV) integration studies and coordination.</p> <p>FY 2024 Plans: Continue to provide SV integration and test support for two PTS prototype payloads availability for launch in FY 2025. Continue to manage and test key system interfaces for PTS prototype Ground, Space, and Gateway Segments as well as PATS ground and</p>		20.696	38.531	84.283

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>
---	--

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
terminal segments to reduce integration risks. Continue to provide SV integration and test support to capability development and interface maturity of PTS prototype. Conduct key interface tests between the PTS prototype and emulators/simulators to reduce risk to PATS level integration with PTES and other partners' protected SATCOM programs. Conduct final launch integration activities to include SV to LV coordination for two PTS prototype payloads. Continue concept of operations development. Continue launch planning and activities and finalize coordination with national and international agencies for orbital slots and frequency allocation. FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased due to supporting the PTS RP Phase with SV integration and the PTS EMD Phase for design/development, both beginning in FY 2024.			
Accomplishments/Planned Programs Subtotals	221.355	252.078	360.126

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

N/A

Remarks

E. Acquisition Strategy

The PTS team utilizes the FY 2016 NDAA MTA guidance for Rapid Prototyping/Rapid Fielding and Section 815 OTA guidance in developing the acquisition strategy. This strategy places an emphasis on the rapid prototyping, production, and incremental iteration of PTS capability. This strategy takes the form of a series of successively honed and tailored spirals, focusing on payload development and hosting opportunities and incorporating lessons learned from Milstar, Enhanced Polar System (EPS), EPS-Recapitalization (EPS-R), AEHF, PTES, and commercial SATCOM practices. The program was initiated in June 2019 when the Space Hub ECU was competitively awarded as a Cost-Plus Incentive-Fee (CPIF) contract to L3-Harris under the Space Enterprise Consortium (SpEC) using OTA. For the Space Segment, PTS RP development of payloads 1-2 were competitively awarded as Firm-Fixed Price (FFP) contracts under the SpEC using OTA to NGC, Lockheed Martin, and Boeing. After completion of the prototype payload Preliminary Design Review (PDR) phase in March 2020, Boeing and NGC were selected to continue building their payloads for launch. Additionally, the Ground Segment (Mission Management/Key Management upgrades) efficiently leverages Boeing's existing PTES contract (competitively awarded CPIF development contract) for PTES software updates and contracts with the US Army Project Management Integrated Enterprise Network (PM IEN) for modifications of WGS mission management systems. The Gateway Segment leverages agreements with the Naval Information Warfare Center (NIWC), PdM SATCOM (US Army), and MIT/LL. The 96th TW supports testing and initial operations and JSEC executes and enables critical testing activities for prototype payload contractors. Plans to transition the MTA to a Major Capability Acquisition (MCA) for the future EMD Phase to reach IOC/FOC are pending approval by the Assistant Secretary of the Air Force for Space Acquisitions and Integration, including the strategy for awarding the Space, Ground, and Gateway Segment development efforts required for the EMD Phase.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>
---	--	---

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PTS RP Development (Hosted)	C/FFP	Boeing : El Segundo, CA	-	168.648	Nov 2021	180.588	Nov 2022	31.497	Oct 2023	-		31.497	0.000	380.733	-
PTS RP Development (Free-Flyer)	C/FFP	Northrop Grumman : Redondo Beach, CA	-	-		-		41.920	Oct 2023	-		41.920	Continuing	Continuing	-
Space Hub End Cryptographic Unit (ECU)	C/CPIF	L3Harris East : Camden, NJ	-	6.111	Jan 2022	3.417	Jan 2023	4.330	Oct 2023	-		4.330	0.000	13.858	-
NSA (ECU Support)	MIPR	TBD : TBD	-	-		-		1.427	Oct 2023	-		1.427	Continuing	Continuing	-
PTS RP Ground Segment Development	C/FFP	Boeing : El Segundo, CA	-	-		-		12.934	Nov 2023	-		12.934	Continuing	Continuing	-
PTS RP Ground Segment Development - CNPS	MIPR	TBD : TBD	-	-		-		5.223	Nov 2023	-		5.223	Continuing	Continuing	-
PTS RP Ground Segment Development - WSTARS	MIPR	TBD : TBD	-	-		-		0.100	Nov 2023	-		0.100	Continuing	Continuing	-
PTS RP Gateway Segment Development	Various	Various : Various	-	-		-		5.420	Oct 2023	-		5.420	0.000	5.420	-
PTS EMD Phase - Payload Development	TBD	TBD : TBD	-	-		-		154.610	Mar 2024	-		154.610	Continuing	Continuing	-
PTS EMD Phase - ECU	TBD	TBD : TBD	-	-		-		1.161	Mar 2024	-		1.161	Continuing	Continuing	-
PTS EMD Phase - Ground/Gateway Development	TBD	TBD : TBD	-	-		-		5.504	Mar 2024	-		5.504	Continuing	Continuing	-
Protected Tactical Testbed	Various	Various : Various	-	8.742	Dec 2021	21.510	Dec 2022	8.400	Nov 2023	-		8.400	Continuing	Continuing	-
JSEC (Protected Tactical Testbed Support)	MIPR	TBD : TBD	-	-		-		3.340	Nov 2023	-		3.340	Continuing	Continuing	-
Technical Baseline Management and System Integration Test Support	Various	Various : Various	-	-		-		19.797	Oct 2023	-		19.797	Continuing	Continuing	-
Technical Mission Analysis (TMA)	RO	Aerospace : El Segundo, CA	-	11.423	Nov 2021	12.428	Nov 2022	20.713	Jan 2024	-		20.713	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	17.792	Jan 2022	24.904	Jan 2023	14.630	Oct 2023	-		14.630	Continuing	Continuing	-
MIT/LL (SE&I Support)	MIPR	MIT/LL : Boston, MA	-	-		-		2.750	Jan 2024	-		2.750	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		-		12.604	Mar 2024	-		12.604	Continuing	Continuing	-

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
<i>PTS Rapid Prototype (RP) Design, Development, I&T</i>																												
PTS Prototype Payload Design and Development	████████████████████																											
PTS Prototypes SV I&T													██████████															
PTS Prototype 1 Available for Launch																	████											
PTS Prototype 2 Available for Launch																	████											
<i>PTS RP Space Hub End Cryptographic Unit (ECU)</i>																												
PTS RP ECU Design/Certification	████████████████████																											
<i>PTS RP Ground Segment Development</i>																												
PTS RP MMS/KMS Upgrades					██																							
<i>PTS RP Gateway Segment Development</i>																												
PTS RP PGET-P Development	██																											
<i>PTS RP Operations</i>																												
PTS RP Launch and Operations													██															
<i>PTS Engineering, Manufacturing, & Development (EMD) Phase</i>																												
PTS EMD Acquisition Planning					████████████████																							
PTS EMD ATP									████																			
PTS EMD Payload Design, Build, and Test									██																			
PTS EMD SV I&T																					████████████████							
PTS EMD Payload Available for Launch																									████			
PTS EMD ECU Design/Certification									██																			
PTS EMD Ground Development													██															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>
---	--	---

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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

PTS EMD Gateway Development																												
Technical Baseline Management and Test																												
System Integration Test Support/Protected Tactical Testbed																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PTS Rapid Prototype (RP) Design, Development, I&T</i>				
PTS Prototype Payload Design and Development	1	2022	4	2023
PTS Prototypes SV I&T	2	2024	4	2024
PTS Prototype 1 Available for Launch	1	2025	1	2025
PTS Prototype 2 Available for Launch	2	2025	2	2025
<i>PTS RP Space Hub End Cryptographic Unit (ECU)</i>				
PTS RP ECU Design/Certification	1	2022	4	2023
<i>PTS RP Ground Segment Development</i>				
PTS RP MMS/KMS Upgrades	1	2023	1	2026
<i>PTS RP Gateway Segment Development</i>				
PTS RP PGET-P Development	1	2022	1	2026
<i>PTS RP Operations</i>				
PTS RP Launch and Operations	1	2025	4	2028
<i>PTS Engineering, Manufacturing, & Development (EMD) Phase</i>				
PTS EMD Acquisition Planning	3	2023	2	2024
PTS EMD ATP	2	2024	2	2024
PTS EMD Payload Design, Build, and Test	2	2024	1	2028
PTS EMD SV I&T	1	2028	4	2028
PTS EMD Payload Available for Launch	4	2028	4	2028
PTS EMD ECU Design/Certification	2	2024	3	2026
PTS EMD Ground Development	1	2025	4	2028
PTS EMD Gateway Development	2	2024	4	2028

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>
---	--	---

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Technical Baseline Management and Test</i>				
System Integration Test Support/Protected Tactical Testbed	1	2022	4	2028