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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

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 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	203.679	145.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	Continuing	Continuing
644415: <i>On-Board Resiliency</i>	-	50.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
645601: <i>Space Defense Capabilities</i>	-	148.526	140.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	0.000	724.119
645611: <i>Assault Breaker II</i>	-	5.153	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.153

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program identifies and addresses space technology and capability gaps in order to facilitate technology transition of military space prototypes into programs of record. It conducts a wide array of activities to model, integrate, test, provide launch integration, and support on-orbit testing of prototype technologies. The supported activities include systems engineering, technology planning, development, demonstration and testing, as well as modeling, simulations, and exercises to support the development and maturation of tactics, techniques, and procedures (TTPs). This also includes the development and prototyping of critical technology within the Department of Defense (DoD) and across other government agencies, academic institutions, and identified industry partners, and the necessary systems engineering to effectively employ such systems.

Specifically, the SSPT Program establishes a cost-effective framework to identify, mature and transition demonstrations and prototypes to:

- Rapidly address identified technology or capability gaps
- Accelerate the maturation of systems intended for demonstrations/prototypes that enhance/compliment/replace existing capabilities
- Support a more reliable, available, maintainable, and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus Science and Technology (S&T) Innovation and facilitate its transition to military space programs of record

This program includes projects for Long Duration Propulsive Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) (LDPE), LDPE's follow-on activity called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Quasi-Zenith Satellite System—Hosted Payload (QZSS-HP), Space-To-Space Communications, rapidly prototype and space-qualify emerging CubeSat technology, and Assault Breaker II (ABII).

LDPE and ROOSTER provides a low-cost, rapid, and flexible on-orbit capability to host and deploy numerous prototypes and payloads utilizing excess payload margin available on US Space Force (USSF) launch missions. Each LDPE/ROOSTER on-orbit platform is currently designed to fly multiple payloads per mission, thus fully utilizing launch potential and providing the only recurring rideshare option for prototypes, demonstrations, and experiments to geosynchronous orbit. ROOSTER's predecessor program, the Long Duration Propulsive Evolved Expendable (EELV) Secondary Payload Adapter (ESPA) (LDPE), consisting of the LDPE-1, -2 and 3A mission concluded in FY2024. The objectives of the ROOSTER program are to enable rapid and cost-effective technology insertion into operational program of records

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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 1206427SF / Space Systems Prototype Transitions (SSPT)
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through the on-orbit checkout and testing of prototypes, demonstrations, and experimental payloads. Additionally, ROOSTER will work to mature operational concepts and TTPs, such as on-orbit refueling, for use within the USSF space enterprise architecture.

Tetra provides a training platform for operators to develop and demonstrate TTPs for pathfinder mission sets. This project directly supports the evolution of operations to include Space Domain Awareness (SDA) and Space Control in alignment with objectives from organizations such as the National Space Test and Training Complex (NSTTC) and USSF Test and Evaluation (TE).

QZSS-HP is a ""pacesetter"" hosted payload that is a high priority for the US and Japan, paving the way for future Allied collaborations. It enhances Geostationary Earth Orbit (GEO) SDA capabilities over the Eurasian theater and facilitates resilient capabilities in the Space Surveillance Network (SSN).

Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space Command and Control (C2) and data transport needs across the space community and enable system-agnostic communication pathways via a mobile ad-hoc network. It also enhances the Defense Advanced Research Projects Agency (DARPA) Space-Based Adaptive Communication Node (Space BACN) modem design to support long-range crosslinks and incorporate emerging optical waveform standards.

The CubeSat technology efforts develops innovative technologies that provide more capabilities than current existing CubeSat technologies. The goal is to mature each applicable capability to Technology Readiness Level (TRL) of 6 or higher (demonstration of system in a relevant environment), test and verify performance, define the specification and operational benefit, and inform relevant Space Systems Command (SSC) program offices of the new capability. The overall goal is to enhance small satellite capabilities as operational satellites miniaturize, meeting the Space Service Acquisition Executive's vision of delivering capabilities faster.

Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack prototypes and develops the Space Force Digital Engineering Ecosystem (DEE) as a cloud-based, remotely accessible, multilevel security, interconnected infrastructure, providing the technical methodology used to store, access, analyze, and visualize evolving systems' data and models throughout systems' acquisition lifecycles. In FY 2024, this activity transferred to PE 1203010SF, Space Force Information Technology (IT), Data Analysis, Digital Solutions, project 645620, Digital Engineering to improve transparency.

ABII is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-Anti-Access/Area Denial (AA/AD) solutions to the Joint Requirements Oversight Council (JROC).

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

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.

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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	166.427	145.948	130.404	0.000	130.404
Current President's Budget	203.679	145.948	133.739	0.000	133.739
Total Adjustments	37.252	0.000	3.335	0.000	3.335
• 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	37.252	0.000	3.335	0.000	3.335

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 644415: *On-Board Resiliency*

Congressional Add: *On-Board Resiliency: USSF-SpRCO*

Congressional Add: *On-Board Resiliency: USSF-SSC*

Congressional Add Subtotals for Project: 644415

Project: 645601: *Space Defense Capabilities*

Congressional Add: *Space-to-Space Communications (Congressional Add ESP Code: CZ)*

Congressional Add: *CubeSat Technologies (Congressional Add ESP Code: CZ)*

Congressional Add Subtotals for Project: 645601

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	29.014	-
	20.986	0.000
	50.000	0.000
	9.648	0.000
	4.824	0.000
	14.472	0.000
	64.472	0.000

Change Summary Explanation

FY 2023: +10.000M; increase for LDPE, ROOSTER, and TETRA efforts.

FY 2023: +31.350M; Above Threshold Reprogramming increase for Space-To-Space Communication.

FY 2025: +3.067M increase for integration of QZSS Hosted Payload per US-Japan International Agreement

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 644415 / <i>On-Board Resiliency</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
644415: <i>On-Board Resiliency</i>	-	50.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Increase space vehicle survivability against current and future threats such as a suite of on-board capabilities with options for integration into their platforms. Develop technologies to increase satellite and enterprise resiliency such as enabling versatile communication pathways and responding to threats.

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

	FY 2023	FY 2024
Congressional Add: On-Board Resiliency: USSF-SpRCO	29.014	-
FY 2023 Accomplishments: Deliver NSA-certified, next generation encryption modules for space capabilities. KG-505 4.0 is the software upgrade and the KG-505A is the hardware change that broadens scope to meet enterprise cryptography and resilience needs, evolving from the original KG-505 requirements to include quantum resistant solutions for onboard resiliency. The KG-505 4.0 contract is scheduled for award 1 March 2023 and the KG-505A is scheduled for award 15 Apr 2023. The KG-505 4.0 will be included with the new production contract.		
Funds to build out the ground system for resiliency payload and for the system integration support of resilience activities on the ground system.		
Congressional Add: On-Board Resiliency: USSF-SSC	20.986	0.000
FY 2023 Accomplishments: Develop technologies to increase satellite and enterprise resiliency such as enabling versatile communication pathways and responding to threats.		
FY 2024 Plans: N/A		
Congressional Adds Subtotals	50.000	0.000

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

N/A

Remarks

D. Acquisition Strategy

Awarded competitive contracts in 4Q FY 2023 for resiliency technologies development. Also awarded FFRDC.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
KG-505				
Development	4	2023	4	2023
USSF-SSC				
Development	4	2023	4	2023

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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
645601: <i>Space Defense Capabilities</i>	-	148.526	140.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	0.000	724.119
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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Specifically, the SSPT Program establishes a cost-effective framework to identify, mature and transition demonstrations and prototypes to:

- Rapidly address identified technology or capability gaps
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- Focus Science and Technology (S&T) Innovation and facilitate its transition to military space programs of record

This program includes projects for Long Duration Propulsive Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) (LDPE), LDPE's follow-on activity called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Quasi-Zenith Satellite System—Hosted Payload (QZSS-HP), Space-To-Space Communications, and rapidly prototype and space-qualify emerging CubeSat technology.

LDPE and ROOSTER provides a low-cost, rapid, and flexible on-orbit capability to host and deploy numerous prototypes and payloads utilizing excess payload margin available on US Space Force (USSF) launch missions. Each LDPE/ROOSTER on-orbit platform is currently designed to fly multiple payloads per mission, thus fully utilizing launch potential and providing the only recurring rideshare option for prototypes, demonstrations, and experiments to geosynchronous orbit. ROOSTER's predecessor program, the Long Duration Propulsive Evolved Expendable (EELV) Secondary Payload Adapter (ESPA) (LDPE), consisting of the LDPE-1, -2 and 3A mission concluded in FY2024. The objectives of the ROOSTER program are to enable rapid and cost-effective technology insertion into operational program of records through the on-orbit checkout and testing of prototypes, demonstrations, and experimental payloads. Additionally, ROOSTER will work to mature operational concepts and TTPs, such as on-orbit refueling, for use within the USSF space enterprise architecture.

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

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Technology Maturation and Prototype Development</p> <p>Description: Plan, develop, test and transition advanced technologies into space system prototypes and capabilities to meet known and emerging threats. Conduct architecture studies, modeling and simulation, technical development, integration and test activities in preparation for transition of critical technologies into prototypes or space programs of record. Develop advanced capabilities for rapid prototyping and integration into space system programs of record and, if requested, to warfighter Urgent Operational Needs (UONs) and Joint Urgent Operational Needs (JUONs). Develop, test and integrate on-orbit platforms for</p>	66.080	61.934	41.963

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>checkout and testing of prototypes and experimental payloads to mature operational concepts and TTPs for future use in the USSF space enterprise architecture. Provide rideshare platform hosting opportunities to geosynchronous orbit. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - ROOSTER: Complete prototype development efforts for ROOSTER-4 Space Vehicle. Complete Space Vehicle integration and factory test campaign and launch vehicle mission unique development/integration efforts. Receive whole of program security accreditation efforts required for launch and on-orbit operations. Award ROOSTER-5 contract and begin development of space vehicle platform. - Tetra: Continue development of Tetra space vehicles to include development of Tetra-5 through integration and test and awarding Tetra-6. - QZSS-HP: Continue the international cooperation with Japan by integrating, testing, and launching two SDA payloads with two Japanese Quasi-Zenith Satellites. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - ROOSTER: Support shipment and launch integration efforts for ROOSTER-4 Space Vehicle. Complete ground system integration and end-to-end testing in support of launch and on-orbit operations campaign. Continue prototype development, for the ROOSTER-5 mission, including ground segment and payload integration efforts. Begin Space Vehicle factory test campaign, launch vehicle mission unique integration efforts, and all program security accreditation efforts. - Tetra: Continue development of Tetra space vehicles to include development of Tetra-6 and complete Tetra-5. Prepare for storage of Tetra-3, -4 and -5 payloads pending updated launch plans. - QZSS-HP: Continue the international cooperation with Japan by integrating and testing the two SDA payloads with the two Japanese Quasi-Zenith Satellites. Support continuation of ground system and data communication development. <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to planned completion of Tetra and QZSS-HP efforts.</p>				
<p>Title: Prototype Integration, Test and On-Orbit Prototype Demonstration</p> <p>Description: Provide rideshare opportunities for prototypes and experiments, fund mission-unique payload integration to the rideshare or launch system, and conduct launch base integration, testing and launch operations. Conduct prototype integration and testing into the designated Command and Control system and provide operational support to conduct prototype testing, demonstration and operations.</p> <p>FY 2024 Plans:</p>		12.933	32.735	23.960

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>- ROOSTER: Complete development and assembly of the first ROOSTER platform (ROOSTER-4) to support FY 2025 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Finalize and integrate ground segment and payloads to enable end-to-end system testing efforts. Finalize on-orbit satellite vehicle operations procedures development and conduct operations training, rehearsals, and exercises. Begin development on an integrated mission plan to support achievement of all prototype payload and space vehicle on-orbit objectives. Establish manifest of prototype and demonstration payloads for ROOSTER-5 mission.</p> <p>- Tetra: Continue development, integration, launch and operations of Tetra space vehicles to include launch and operations of Tetra 1 and 4.</p> <p>- QZSS-HP: Continue integration and testing in support of a Quasi-Zenith Satellite 7 launch in FY 2024. Conclude the integration, test and launch of both hosted payloads in cooperation with the Japanese government. Support on-orbit Developmental Test activities post launch to enable warfighter capabilities for both hosted payloads.</p> <p>FY 2025 Plans:</p> <p>- ROOSTER: Support launch of ROOSTER-4 aboard the USSF-43 mission and begin the planned 12-month on-orbit prototype testing and demonstration phase. Conduct on-orbit test and demonstration to enable technology maturation of the platform and prototype/experimental payloads. Begin operations training and testing activities of the second ROOSTER platform to support FY 2027 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Begin early payload integration risk reduction efforts.</p> <p>- Tetra: Continue integration, storage and operations to support future launch of Tetra 3, 4, & 5 space vehicles in mid to late FY 2025 or later.</p> <p>- QZSS-HP: In cooperation with the Japanese government, continue and complete integration and testing of the two SDA payloads in support of Quasi-Zenith 6 & 7 launches in FY 2025. Support on-orbit Development Test activities post-launch to enable warfighter capabilities for both hosted payloads.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to planned completion of Tetra and QZSS-HP efforts.</p>				
<p>Title: Long Duration Propulsive ESPA (LDPE)</p> <p>Description: The LDPE platform provides a standard rideshare service for a wide variety of secondary payload options. It features 6 ports and accommodates ten to twelve fixed and/or separable prototype payloads. After the forward payload separates, the LDPE platform separates and propels to mission orbit, typically GEO, approximately 22,000 miles above the earth. The LDPE platform can maneuver to allow prototype/experimental payloads to be dropped off at different locations or remain hosted to the ring based on mission requirements.</p> <p>FY 2024 Plans:</p>		9.063	1.279	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Complete planned 12-month execution of LDPE-2 and LDPE-3A on-orbit prototype testing, demonstration, and operational support for LDPE hosted payloads. Support the transition of LDPE-2 and LDPE-3A to operational and/or test USSF units to conduct residual operations.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to the completion of LDPE-2 and LDPE-3A on-orbit operations. The ROOSTER program is the follow-on activity to LDPE.</p>				
<p>Title: Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack</p> <p>Description: The Digital Engineering (DE) tech stack provides a common cloud-base, remotely accessible, multi-level security, interconnected infrastructure. The DEICE tech stack provides specialized tools required to perform model based systems engineering (MBSE) activities to create system models, perform simulations, and analyze the results to accelerate the pace of acquisition across the lifecycle from requirements generation, to design reviews, through manufacturing and test, and finally supporting fielding with digital twins. The DEICE tech stack provides the program offices, government stakeholders, and industry partners with a common DE as a Service (DEaaS) capability. The building of the DEICE capabilities will be accomplished using 6-month increments based on Agile management techniques. The needed capabilities will be collected from across the SSC programs and stored in a Product Backlog. Twice a year, this list will be prioritized by an enterprise governance board to direct the activities of adding new capabilities to the Ecosystem. The capabilities will be delivered when competed, tested and approved.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		14.628	0.000	0.000
<p>Title: Space-To-Space Communications</p> <p>Description: Continue Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space C2 and data transport needs across the space community and enable system agnostic communication pathways via a mobile ad-hoc network. Enhance the DARPA Space BACN modem design to support long-range</p>		30.000	5.000	67.816

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
crosslinks and incorporate emerging optical waveform standards. Perform environmental testing to characterize the impacts of operating in the space environment and to mitigate those impacts if design modifications are necessary.				
<p>FY 2024 Plans: Award contracts and begin development activities to enable the future Space-to-Space Data Transport network. Develop high-power amplifiers, low-Size, Weight, and Power Application-Specific Integrated Circuit (SWaP ASIC) photonic modems, and scalable affordable components for enterprise terminals. Continue elements begun under Space Combat Cloud, to include proliferating the enterprise standards, developing network topology and mesh Concept of Operations (CONOPS), and evolve concepts, preliminary designs, and enterprise architectural solutions. Continue program office and other related support activities that may include, but are not limited to, studies, technical analyses, experimentation, prototyping, operational testing, and participation/integration into joint warfighting exercises.</p> <p>FY 2025 Plans: Continue development of optical communication terminal prototypes through Other Transactional Agreements and fund the Optical Terminal Verification Testbed at MIT/LL. Develop interface controls and integration plans in preparation for a space-based prototype demonstration. Mature networking management of optical crosslinks in partnerships with other organizations. Enhance the DARPA Space BACN modem design to support long-range crosslinks and incorporate emerging optical waveform standards.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to ramp up of development efforts for optical communication prototypes and the simultaneous cooperative effort with DARPA to develop the Space BACN modem.</p>				
<p>Title: Front Door To Space</p> <p>Description: Seeks to invigorate collaborative culture with industry by creating access to partnering services for the Department of Defense (DoD) via host of budget and contracting vehicles.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		1.350	0.000	0.000
<p>Title: Solar Power</p>		0.000	40.000	0.000

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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Description: Solar Power</p> <p>FY 2024 Plans: Continue developing space-based solar power collection and transmission technology via a series of integrated demos and technology development/maturation efforts: 1) continue space flight demonstration of solar-to RF panel payload (take delivery of solar-to-RF payload emulator, validate payload for delivery, continue pre integration of payload-to-bus), 2) deliver thermal integrated demonstration for on-orbit demonstration, 3) initiate structural operational prototype based on results from scaled array payload demonstrations and validated models, 4) update operational prototype concept designs/analysis based on tile, rectenna, thermal and structure demonstrations and updated models, and 5) continue functional demonstrations for critical technologies in energy generation, deployable structures, thermal technology, RF transmission, and distributed control.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Scope realignment into PE 1206616SF</p>				
Accomplishments/Planned Programs Subtotals		134.054	140.948	133.739
		FY 2023	FY 2024	
<p>Congressional Add: Space-to-Space Communications (Congressional Add ESP Code: CZ)</p> <p>FY 2023 Accomplishments: Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space C2 and data transport needs across the space community and enable system agnostic communication pathways via a mobile ad-hoc network.</p> <p>FY 2024 Plans: N/A</p>		9.648	0.000	
<p>Congressional Add: CubeSat Technologies (Congressional Add ESP Code: CZ)</p> <p>FY 2023 Accomplishments: Rapid prototyping and space qualification of emerging CubeSat technologies to mature a capability to a Department of Defense (DoD) Technology Readiness Level (TRL) of 6 or higher.</p> <p>FY 2024 Plans: N/A</p>		4.824	0.000	
Congressional Adds Subtotals		14.472	0.000	
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>

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

Remarks

The Tetra-5 contract award included three separate space vehicles, one funded by SSPT (5a) and the other two by AFRL (5b & 5c). AFRL Tetra-5c has now been repurposed to fulfill Tetra-6 mission.

D. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The SSPT program consists of numerous projects in which the program office will leverage rapid prototyping authorities to the maximum extent possible.

The acquisition strategy for the follow-on effort for ROOSTER, was approved in 2Q FY 2022. A sole-source contract was awarded for ROOSTER 2Q FY 2023 which supports the ROOSTER-4 ILC 2Q FY 2025. The follow-on contract for ROOSTER-5 is planned to be awarded in 3Q FY 2024.

Tetra's acquisition strategy is based on an annualized satellite procurement, development, and launch integration effort. Each Tetra satellite is a unique design intended to further the capabilities of small-satellites and mature emerging technologies. The first two unique Tetras were procured simultaneously as the first award on Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA), followed by two subsequent Tetra missions. Tetra 5a awarded in 4Q FY 2022. AFRL Tetra-5c has now been repurposed to fulfill Tetra-6 mission.

The QZSS-HP acquisition strategy is based on the development of two MIT LL prototype payloads and a strategic partnership with the government of Japan. The payloads will provide Space Domain Awareness (SDA) resilience for USSF as a contributing sensor, partial on-board processing to enable indications and warnings on tactical timelines, and rapid development with operational leave-behind. The performance of the payloads on orbit will inform requirements and accelerate design for follow on systems, as well as inform SDA Force Design and architecture.

For the Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack effort, the Space Force plans to employ agile software development practices and techniques, such as flexible requirements, frequent user interaction, and rapid delivery. The program will acquire tools and capabilities through an agile-based Rapid Delivery Framework that develops, integrates, and delivers new features and capabilities through 180-day program increments. To provide the cloud-based environment, an existing contract with Cloud One providers will be utilized to provide the software licenses, computer hosting, and cybersecurity. In addition, FFRDCs will provide expertise to develop needed Digital Engineering capabilities as well as optimizing the software configurations to support needed features. Finally, a current SBIR Phase 3 contract will be used to implement new Digital Engineering capabilities based on industry best practices including the management of the Product Backlog, assisting with on-boarding new programs, building training for new users, providing system admin support, and creating scripts and features allowing Digital Engineering activities to be automated.

The Space-to-Space (S2S) Communications acquisition strategy is to award agreements to multiple developers to develop beyond Low Earth Orbit optical crosslink terminal prototypes. These awards will occur on the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) vehicle using a three-phased approach with potential down-selects occurring after Phase 1 and/or Phase 2. The total period of performance is planned for 34 months. In parallel, the project will fund further

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
development of a low size, weight, and power optical modem developed under the DARPA Space BACN program to support long-range crosslinks and emerging waveform standards.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity 3620F / 4				R-1 Program Element (Number/Name) PE 1206427SF / Space Systems Prototype Transitions (SSPT)				Project (Number/Name) 645601 / Space Defense Capabilities							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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
LDPE-1, 2 & 3A Launch Vehicle Integration & On-Orbit Anomaly Ops	Various	Various: Various : TBD	-	3.954	Dec 2022	0.267	Jan 2024	-		-		-	0.000	4.221	-
LDPE-2, 3A Ground Systems Development & On-Orbit Ops	Various	Various : Various : TBD	-	4.948	Dec 2022	1.001	Nov 2023	-		-		-	0.000	5.949	-
ROOSTER Development	C/FFP	Northrop Grumman : VA : TBD	-	26.054	Jan 2023	21.269	Jan 2024	27.032	Jan 2025	-		27.032	Continuing	Continuing	-
ROOSTER Launch Vehicle and Payload Integration, On-Orbit Anomaly Ops	C/CPFF	Northrop Grumman : VA : TBD	-	3.418	Jan 2023	13.460	Jan 2024	13.400	Jan 2025	-		13.400	Continuing	Continuing	-
ROOSTER Launch Vehicle Mission Unique, Ground Systems Development & On-Orbit Ops	C/Various	Various : Various : TBD	-	4.888	Jan 2023	8.472	Nov 2023	8.800	Jan 2025	-		8.800	Continuing	Continuing	-
Tetra 3 & 4 Development	C/FFP	York Space Systems : CO : TBD	-	0.197	Jan 2023	-		-		-		-	0.000	0.197	-
Tetra 5a Development	C/CPIF	Orion Space Solutions: CO : TBD	-	14.821	Feb 2023	8.292	Jan 2024	-		-		-	0.000	23.113	-
Tetra 5c Development	C/CPIF	Orion Space Solutions: CO : TBD	-	-		9.687	Jan 2024	2.000	Jan 2025	-		2.000	Continuing	Continuing	-
Tetra-1, 3, 4 & 5a Prototype Integration, Test & On-Orbit Prototype Demonstration	C/Various	Various : Various : TBD	-	1.078	Jan 2023	7.230	Jan 2024	1.000	Jan 2025	-		1.000	0.000	9.308	-
Tetra-1, 3 & 4 Payload Integration into LDPE/ROOSTER Ring	C/CPAF	Various : Various : TBD	-	1.330	Jan 2023	-		-		-		-	0.000	1.330	-
QZSS-HP Development, Integration & Ground System	Various	Various : Various : TBD	-	8.436	Nov 2022	14.042	Jan 2024	5.535	Nov 2024	-		5.535	Continuing	Continuing	-
QZSS-HP Payloads Shipping and Security (Japan)	Various	Various : Various : TBD	-	2.219	Nov 2022	3.573	Nov 2023	1.760	Jan 2025	-		1.760	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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
Digital Engineering Ecosystem	Various	Not specified. : TBD	-	2.564	Jan 2023	-		-		-		-	0.000	2.564	-
Digital Engineering Space DEN	TBD	Not specified. : TBD	-	5.000	Jan 2023	-		-		-		-	0.000	5.000	-
Space-to-Space Communications (Congressional Add ESP: CZ)	C/TBD	TBD : TBD : TBD	-	9.527	Apr 2023	-		-		-		-	0.000	9.527	-
Space-to-Space Comm. Space Terminal	TBD	Various: Various : TBD	-	15.000	Nov 2023	5.020	Jan 2024	51.816	Jan 2025	-		51.816	Continuing	Continuing	-
Space-to-Space Comm. SDN C2 System	TBD	TBD : TBD : TBD	-	10.000	Feb 2024	-		12.000	Jan 2025	-		12.000	Continuing	Continuing	-
Space-to-Space Comm. Testbed	TBD	TBD : TBD : TBD	-	5.000	Mar 2024	-		2.100	Jan 2025	-		2.100	Continuing	Continuing	-
CubeSat (Congressional Add ESP: CZ)	C/TBD	TBD : TBD : TBD	-	4.824	Jan 2024	-		-		-		-	0.000	4.824	-
MANTA	C/CPFF	Gen. Dynamics: CA : TBD	-	6.298	Sep 2023	-		-		-		-	0.000	6.298	-
Solar Power	C/CPAF	TBD: TBD : TBD	-	-		40.000	Mar 2024	-		-		-	0.000	40.000	-
Technical Mission Analysis	Various	Various : Various : TBD	-	4.018	Jan 2023	3.388	Jan 2024	2.937	Jan 2025	-		2.937	Continuing	Continuing	-
Subtotal			-	133.574		135.701		128.380		-		128.380	Continuing	Continuing	N/A

Remarks
The Tetra-5 contract award included three separate space vehicles, one funded by SSPT (5a) and the other two by AFRL (5b & 5c).

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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	RO	Various : Various : TBD	-	2.959	Jan 2023	1.282	Jan 2024	1.026	Jan 2025	-		1.026	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029				
	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	
LDPE-1																													
Launch/Ops																													
LDPE-2																													
Launch/Ops																													
LDPE-3A																													
Development & Integration																													
Launch/Ops																													
ROOSTER-4																													
Development																													
Integration																													
Launch/Ops																													
ROOSTER-5																													
Development																													
Integration																													
Launch/Ops																													
Tetra-1																													
Launch/Ops																													
Tetra-2																													
Development																													
Tetra-3																													
Development & Integration																													
Launch/Ops																													
Tetra-4																													
Development																													

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	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
Integration																												
Launch/Ops																												
Tetra-5a																												
Development																												
Integration																												
Launch/Ops																												
Tetra-5c																												
Development																												
Integration																												
Launch/Ops																												
QZS 6-Hosted Payload																												
Development																												
Integration																												
Launch/Ops																												
QZS 7-Hosted Payload																												
Development																												
Integration																												
Launch/Ops																												
Space Combat Cloud																												
Development																												
DEICE Tech Stack																												
Platform Compute and Store																												
Minimum Viable Product - Development																												
Increment 1																												
Integration & Operations																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LDPE-1				
Launch/Ops	1	2023	3	2024
LDPE-2				
Launch/Ops	1	2023	3	2024
LDPE-3A				
Development & Integration	1	2023	1	2023
Launch/Ops	2	2023	3	2024
ROOSTER-4				
Development	1	2023	4	2024
Integration	3	2024	3	2025
Launch/Ops	3	2025	3	2026
ROOSTER-5				
Development	3	2024	2	2026
Integration	2	2026	4	2027
Launch/Ops	4	2027	4	2028
Tetra-1				
Launch/Ops	1	2023	2	2024
Tetra-2				
Development	1	2023	2	2024
Tetra-3				
Development & Integration	1	2023	3	2025
Launch/Ops	3	2025	3	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Tetra-4</i>				
Development	1	2023	3	2024
Integration	3	2024	1	2025
Launch/Ops	2	2025	3	2026
<i>Tetra-5a</i>				
Development	1	2023	2	2025
Integration	2	2025	3	2025
Launch/Ops	3	2025	3	2027
<i>Tetra-5c</i>				
Development	2	2024	4	2026
Integration	1	2026	4	2027
Launch/Ops	1	2028	4	2029
<i>QZS 6-Hosted Payload</i>				
Development	1	2023	2	2023
Integration	2	2023	2	2025
Launch/Ops	2	2025	4	2029
<i>QZS 7-Hosted Payload</i>				
Development	1	2023	4	2023
Integration	4	2023	3	2025
Launch/Ops	3	2025	4	2029
<i>Space Combat Cloud</i>				
Development	1	2023	4	2024
<i>DEICE Tech Stack</i>				
Platform Compute and Store	2	2023	4	2023
Minimum Viable Product - Development	2	2023	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Increment 1	4	2023	4	2023
Integration & Operations	4	2023	4	2023
<i>Space-to-Space Communications (Congressional Add ESP Code: CZ)</i>				
Development	3	2023	2	2024
<i>Space-to-Space Communications</i>				
Space Terminals	1	2024	2	2027
SDN C2 System	2	2025	4	2026
Comm Testbed	2	2025	4	2027
<i>CubeSat</i>				
Development	4	2023	4	2024
<i>Solar Power</i>				
Development	2	2024	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
645611: <i>Assault Breaker II</i>	-	5.153	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.153
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Assault Breaker II (ABII) is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-anti-access/area denial solutions to the Joint Requirements Oversight Council (JROC).

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

	FY 2023	FY 2024	FY 2025
Title: Assault Breaker II	5.153	5.000	0.000
Description: Assault Breaker II is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-anti-access/area denial solutions to the JROC.			
FY 2024 Plans: Provide warfighter analysis, experiments, and development of modeling and simulation tools to support warfighting objectives established by DARPA.			
FY 2025 Plans: Provide warfighter analysis, experiments, and development of modeling and simulation tools to support warfighting objectives established by OSD (R&E).			
FY 2024 to FY 2025 Increase/Decrease Statement: Decreased due to level of maturity of the program and transition to OSD (R&E).			
Accomplishments/Planned Programs Subtotals	5.153	5.000	0.000

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

N/A

Remarks

D. Acquisition Strategy

Funds are sent to DARPA via a Military Interdepartmental Purchase Request (MIPR). The effort will transition from DARPA to OSD(R&E) in FY25 in accordance with a future Memorandum of Understanding to codify USSF (Service) obligations continuing analysis and development efforts.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
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>Assault Breaker II</i>	
Development	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Assault Breaker II</i>				
Development	1	2023	4	2024