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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

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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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	163.796	91.851	106.252	0.000	106.252	110.073	76.925	74.833	76.310	Continuing	Continuing
645601: <i>Space Defense Capabilities</i>	-	163.796	86.851	101.099	0.000	101.099	110.073	76.925	74.833	76.310	Continuing	Continuing
645611: <i>Assault Breaker II</i>	-	0.000	5.000	5.153	0.000	5.153	0.000	0.000	0.000	0.000	0.000	10.153

Note

This program, BA 4, PE 1206427SF, project 645601, Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack, is a new start.

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program will identify and address space technology and capability gaps in order to facilitate technology transition to military space prototypes and programs of record. It will conduct a wide array of activities to model, integrate, test, and provide launch integration and support on-orbit testing of prototype technologies. The supported activities include: systems engineering, technology planning, development, demonstrations and testing, as well as modeling, simulations and exercises to support the development and maturation of tactics and procedures. This includes the development and prototyping of critical technology within the Department of Defense, across other government agencies, academic institutions and industry partners that are identified 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 an existing capability
- Support a more reliable, available, maintainable and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus 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) and its follow-on activities called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Blackjack, Quasi-Zenith Satellite System (QZSS)-Hosted Payload (HP), Military Application of the Space Environment (MASE), Space Combat Cloud, Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack, and Assault Breaker II (ABII).

LDPE and ROOSTER provide 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 and experiments to geosynchronous orbit. The LDPE acquisition baseline includes the following mission scope: LDPE-1, -2 and -3A. All missions beyond LDPE-3A are planned as part of ROOSTER activities. The objectives of the ROOSTER

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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>	
<p>project are to rapidly and cost-effectively enable on-orbit checkout and testing of prototypes and demonstration payloads and to mature operational concepts and Techniques, Tactics and Procedures (TTPs) for future use in the USSF space enterprise architecture.</p> <p>Tetra is a project that will provide 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 situational awareness and control in alignment with objectives from organizations such as the National Space Test and Training Center (NSTTC) and USSF Test and Evaluation (TE).</p> <p>Blackjack is a joint technology demonstration project led by DARPA and the Space Force to evaluate military utility and concepts of operation for a Proliferated Low Earth Orbit (P-LEO) satellite constellation. The project leverages industry innovation in commercial P-LEO concepts by integrating military payloads onboard commercial commoditized satellite vehicles, demonstrating onboard data processing and autonomous tasking, and transmitting encrypted data through a mesh network of satellites in LEO with the goals of augmenting existing warfighter capability, increasing national security space resiliency, and decreasing per-unit satellite costs.</p> <p>QZSS-HP is a "pacesetter" hosted payload that is a high priority for the U.S. and Japan, paving the way for future Allied collaborations. It enhances Geostationary Earth Orbit (GEO) Space Domain Awareness (SDA) capabilities over the Eurasian theater and facilitates resilient capabilities in the Space Surveillance Network (SSN).</p> <p>MASE effort will demonstrate mature space environment technology to improve combat operations. MASE will enhance regional ionospheric specification (nowcasts) and predictions (forecasts) affecting signal propagation paths. MASE uses traditional and non-traditional ionospheric measurements in advanced space environment models to forecast and predict impacts to weapon systems. It contributes to satisfying Gaps 4 and 7 of the Space-Based Environment Monitoring (SBEM) requirements. In FY 2021, Congress transferred FY 2021 funds from Air Force to Space Force appropriations to fix an appropriation error.</p> <p>Space Combat Cloud activity includes enterprise standards definition and synchronizes space-to-space C2 needs across the space community. Activity also includes technology maturation, network definition and prototype planning.</p> <p>DEICE Tech Stack is a New Start in FY 2023. 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.</p> <p>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).</p> <p>Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems 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.</p>		

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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.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	151.595	101.851	0.000	0.000	0.000
Current President's Budget	163.796	91.851	106.252	0.000	106.252
Total Adjustments	12.201	-10.000	106.252	0.000	106.252
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-15.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	17.200	0.000			
• SBIR/STTR Transfer	-4.999	0.000			
• Other Adjustments	0.000	0.000	106.252	0.000	106.252

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

Project: 645601: *Space Defense Capabilities*

Congressional Add: *Space Combat Cloud*

Congressional Add Subtotals for Project: 645601

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	-	5.000
	-	5.000
	-	5.000

Change Summary Explanation

FY 2021: -4.999M; SBIR reduction.

FY 2021: +17.200M; Above Threshold Reprogramming (ATR) to address COVID-19 impacts and cost increases to Space Domain Awareness (SDA) sensor development as well as to support the initial stand up of the Assault Breaker II initiative.

FY 2022: -15.000M; Congressional Directed Reduction for ROOSTER development delay

FY 2022: +5.000M; Congressional Add for Space Combat Cloud

FY 2023: The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force										Date: April 2022		
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>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
645601: <i>Space Defense Capabilities</i>	-	163.796	86.851	101.099	0.000	101.099	110.073	76.925	74.833	76.310	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 1206427SF, project 645601, Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack, is a new start.

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program will identify and address space technology and capability gaps in order to facilitate technology transition to military space prototypes and programs of record. It will conduct a wide array of activities to model, integrate, test, and provide launch integration and support on-orbit testing of prototype technologies. The supported activities include: systems engineering, technology planning, development, demonstrations and testing, as well as modeling, simulations and exercises to support the development and maturation of tactics and procedures. This includes the development and prototyping of critical technology within the Department of Defense, across other government agencies, academic institutions and industry partners that are identified 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 an existing capability
- Support a more reliable, available, maintainable and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus 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) and its follow-on activities called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Blackjack, Quasi-Zenith Satellite System (QZSS)-Hosted Payload (HP), Military Application of the Space Environment (MASE), Space Combat Cloud, Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack.

LDPE and ROOSTER provide 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 and experiments to geosynchronous orbit. The LDPE acquisition baseline includes the following mission scope: LDPE-1, -2 and -3A. All missions beyond LDPE-3A are planned as part of ROOSTER activities. The objectives of the ROOSTER project are to rapidly and cost-effectively enable on-orbit checkout and testing of prototypes and demonstration payloads and to mature operational concepts and Techniques, Tactics and Procedures (TTPs) for future use in the USSF space enterprise architecture.

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Tetra is a project that will provide 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 situational awareness and control in alignment with objectives from organizations such as the National Space Test and Training Center (NSTTC) and USSF Test and Evaluation.

Blackjack is a joint technology demonstration project led by DARPA and the Space Force to evaluate military utility and concepts of operation for a Proliferated Low Earth Orbit (P-LEO) satellite constellation. The project leverages industry innovation in commercial P-LEO concepts by integrating military payloads onboard commercial commoditized satellite vehicles, demonstrating onboard data processing and autonomous tasking, and transmitting encrypted data through a mesh network of satellites in LEO with the goals of augmenting existing warfighter capability, increasing national security space resiliency, and decreasing per-unit satellite costs.

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

MASE effort will demonstrate mature space environment technology to improve combat operations. MASE will enhance regional ionospheric specification (nowcasts) and predictions (forecasts) affecting signal propagation paths. MASE uses traditional and non-traditional ionospheric measurements in advanced space environment models to forecast and predict impacts to weapon systems. It contributes to satisfying Gaps 4 and 7 of the Space-Based Environment Monitoring (SBEM) requirements. In FY 2021, Congress transferred FY 2021 funds from Air Force to Space Force appropriations to fix an appropriation error.

Space Combat Cloud activity includes enterprise standards definition and synchronizes space-to-space C2 needs across the space community. Activity also includes technology maturation, network definition and prototype planning.

DEICE Tech Stack is a New Start in FY 2023. 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.

A FY 2021 Omnibus Above Threshold Reprogramming added \$5M to support initial stand up of the Assault Breaker II (ABII) initiative, quick turn studies to examine various aspects of warfighting architectures, and an analysis of the current Modeling, Simulation, and Analysis (MS&A) environment. ABII transitions to a dedicated Project 645611 in FY 2022.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Technology Maturation and Prototype Development	59.200	35.100	49.700	0.000	49.700
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					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>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 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.</p> <p>FY 2022 Plans: Continue prototype/technology developments across multiple mission areas, including but not limited to: -ROOSTER: Continue risk-reduction, technical analysis, and technology maturation efforts on a propulsive multi-mission payload adapter ring and components to inform ROOSTER prototype requirements and design in order to reduce cost per ring, shorten payload integration timeline, and enable flexible swap of prototype and demonstration payload. -Tetra: Continue development of Tetra-3 prototype to support experimentation and TTP development at GEO. Deliver Tetra-3 for launch. Award the development of Tetra-5 prototype. -Blackjack: Complete integration and delivery of prototype, cyber, ground and data processing architecture as well as develop concepts of operations to support C2 system integration. -QZSS-HP development (International Cooperation): Complete development, and begin build and test of two SDA sensors intended for hosting on two Japanese Quasi-Zenith Satellites. -Pursue technology investment to support the space enterprise investment strategy: commercial and allied opportunities; cross mission data transport, proliferated payloads and buses; orbital maneuver; alternative orbits; dynamic communication networks; and Fighting PNT and SATCOM, etc. -Additionally, FY2022 funding will allow the program 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.</p> <p>FY 2023 Base Plans: - ROOSTER: Continue prototype development, including ground segment and payload integration efforts. Begin Space Vehicle factory test campaign, launch vehicle mission unique integration efforts, and whole of program security accreditation efforts. - Tetra: Continue development of Tetra space vehicles to include development of Tetra-4 through integration and test and Tetra-5 through assembly. - QZSS-HP: Continue the international cooperation with Japan by testing the two SDA with the two Japanese Quazi-Zenith Satellites.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>- Pursue technology investment to support the space enterprise investment strategy: commercial and allied opportunities; cross mission data transport, proliferated payloads and buses; orbital maneuver; alternative orbits; dynamic communication networks; and Fighting PNT and SATCOM, etc.</p> <p>- Additionally, FY 2023 funding will allow the program 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.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased due to ramp up of ROOSTER development activities.</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 2022 Plans: -ROOSTER: Perform evaluations in preparation for and award contract for ROOSTER platforms as a follow-on to LDPE-3A. Begin fabrication and assembly of the first ROOSTER platform to support FY 2024 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Begin associated ground segment and early payload integration risk reduction efforts. -Tetra: Perform on-orbit demonstrations, operations and provide reach back support for Tetra-1 and Tetra-2. Provide satellite, payload and LDPE integration, and testing for Tetra-3 and Tetra-4. Provide launch and on-orbit operations for Tetra-3. -Blackjack: Deliver remaining flight hardware for assembly, integration, and test and provide technical reach back engineering during on-orbit demonstration activities. Conduct technical reviews, integration and testing of prototypes with launch vehicle in support of launch and on-orbit demonstrations. Continue integration of fully assembled and tested Blackjack satellites with launch vehicles, launch the remaining satellites into LEO to complete the constellation, and conduct early orbit testing and demonstration.</p>	42.802	19.140	18.434	0.000	18.434

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B. Accomplishments/Planned Programs (\$ in Millions)					
<p>-QZSS-HP (International Cooperation): Start integration and testing of hosted payload prototypes with Japan's QZSS satellite buses and launch vehicles in support of the Quasi-Zenith Satellite 6 launch in FY 2023.</p> <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none"> - ROOSTER: Continue development of the first ROOSTER platform to support FY 2025 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Begin on-orbit satellite vehicle operations procedures development, conduct operations training, rehearsals, and exercises. - Tetra: Continue development and integration efforts for Tetra-2,3, 4,and 5 vehicles to include launch and operations of Tetra 3. - Blackjack: Finalize remaining assembly, integration, and test and provide technical reach back engineering during on-orbit demonstration activities. Conduct technical reviews, integration and testing of prototypes with launch vehicle in support of launch and on-orbit demonstrations. Launch remaining satellites into LEO to complete the constellation, and conduct early orbit testing and full architecture demonstration. - QZSS-HP: Finish integration and testing of hosted payload prototypes with Japan's QZSS satellite buses and launch vehicles in support of the Quasi-Zenith Satellite-6 launch in FY 2023. Start integration and testing of hosted payload prototypes in support of the Quasi-Zenith Satellite-7 launch in FY 2024. <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased due to ramp down of Blackjack integration activities.</p>					
Title: Long Duration Propulsive ESPA (LDPE)					
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.					
FY 2022 Plans: Conduct LDPE-1 & 2 on-orbit test and demonstration to enable technology maturation of the platform and prototype/experimental payloads. Continue planned 12-month execution of LDPE-1 & LDPE-2 on-orbit prototype testing, demonstration, and operational support for LDPE hosted payloads. Finalize LDPE-3A mission payload integration/test and ground development while initializing launch site processing and operational					
	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
	39.600	19.096	4.900	0.000	4.900

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B. Accomplishments/Planned Programs (\$ in Millions)					
<p>readiness campaign. Support launch of LDPE-3A and begin the planned 12-month on-orbit prototype testing and demonstration phase.</p> <p>FY 2023 Base Plans: Support the transition of LDPE-1 and LDPE-2 to operational and/or test USSF units to conduct residual operations. Support the launch of LDPE-3A aboard the USSF-67 mission and conduct on-orbit test and demonstration to enable technology maturation of the platform and prototype/experimental payloads. Continue planned 12-month execution of LDPE-3A on-orbit prototype testing, demonstration, and operational support for LDPE hosted payloads.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased due to LDPE-1 and 2 completion.</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 2022 Plans: N/A</p> <p>FY 2023 Base Plans: - Prototype, develop, test and establish the Space Force Digital Engineering as a Service (DEaaS) Environments hosted on the Air Force Cloud One platform for cloud-computing and database storage (compute & store).</p>					
	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
	-	0.000	19.100	0.000	19.100

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>- Develop and test the minimum viable product (MVP) for DEaaS by providing a virtual desktop with digital engineering tools and collaboration work spaces for the architects and systems engineers of the initial programs; Protected Anti-Jam Tactical SATCOM, Evolved Strategic SATCOM, and Space Integration Office System of Systems Engineering Division.</p> <p>- Continue development and testing of DEaaS with Increment 1 to link to DEaaS Environments with acquisition and operational databases, and add additional programs into the DEaaS Environment from across SSC.</p> <p>- Implement Integration and Operational practices for system monitoring and security procedures.</p> <p>- 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.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased due to DEICE Tech Stack being a New Start in FY 2023.</p>					
<p>Title: Assault Breaker II</p> <p>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.</p> <p>FY 2022 Plans: N/A</p> <p>FY 2023 Base Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: N/A</p>	5.000	0.000	0.000	-	0.000
<p>Title: MASE</p> <p>Description: Demonstrates mature space environment technology to improve combat operations. Enhances regional ionospheric (nowcasts) and predictions (forecasts) affecting signal propagation paths. Uses traditional</p>	11.000	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)						
and non-traditional ionospheric measurements in advanced space environment models to forecast and predict impacts to weapon systems.						
FY 2022 Plans: N/A						
FY 2023 Base Plans: N/A						
FY 2023 OCO Plans: N/A						
Title: Management Services						
Description: Management Services						
FY 2022 Plans: Management Services						
FY 2023 Base Plans: Management Services						
FY 2023 OCO Plans: Management Services						
FY 2022 to FY 2023 Increase/Decrease Statement: Management Services						
Accomplishments/Planned Programs Subtotals						
		6.194	8.515	8.965	0.000	8.965
		163.796	81.851	101.099	0.000	101.099
Congressional Add: Space Combat Cloud						
FY 2022 Plans: Complete enterprise standards and define security infrastructure. Evolve concepts, preliminary designs, and architectural solutions. Explore key technologies for maturation including exquisite high powered amplifiers, low SWaP ASIC subsystems, and scalable affordable components for enterprise construct. Evaluate network topology and mesh solutions. Activities may also include, but are not limited to program office support,						
		-	5.000			

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	FY 2021	FY 2022
studies, technical analyses, experimentation, prototyping, operational testing, and participation/integration into joint warfighting exercises.		
Congressional Adds Subtotals	-	5.000

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

N/A

Remarks

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.

LDPE is an ACAT III program and all systems are on contract and on schedule to achieve their projected Initial Launch Capability (ILC). The acquisition strategy is in coordination for the follow-on effort to LDPE, called ROOSTER. ROOSTER platforms are expected to be competitively awarded. Contract award is expected in FY 2022 which supports the ROOSTER 4 ILC of 4th Quarter 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. A fifth Tetra is planned for procurement in FY 2022.

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.

For ABII, funds are sent to DARPA via a Military Interdepartmental Purchase Request (MIPR).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

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 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 & Ops	Various	Various: Various : TBD	-	29.335	Jul 2021	13.427	Jan 2022	4.150	Dec 2022	-		4.150	Continuing	Continuing	-
LDPE-2, 3A Launch Support Activities	Various	Various: Various : TBD	-	7.705	Jul 2021	5.669	Jan 2022	0.780	Dec 2022	-		0.780	Continuing	Continuing	-
LDPE-3A Development	Various	Various: Various : TBD	-	2.529	Mar 2021	-		-		-		-	0.000	2.529	-
ROOSTER Development	C/FFP	TBD : TBD : TBD	-	1.424	Apr 2021	4.273	May 2022	21.494	Jan 2023	-		21.494	Continuing	Continuing	-
ROOSTER Ops, LV, Payload Integration	C/TBD	TBD : TBD : TBD	-	-		-		7.450	Jan 2023	-		7.450	Continuing	Continuing	-
Tetra 3 & 4 Development	C/FFP	York Space Systems : CO : TBD	-	1.020	Nov 2020	2.076	Jan 2022	0.747	Jan 2023	-		0.747	Continuing	Continuing	-
Tetra 5 Development	C/FFP	TBD : TBD : TBD	-	-		10.549	May 2022	10.695	Feb 2023	-		10.695	Continuing	Continuing	-
Tetra-1,2 & 3 Prototype Integration, Test & On-Orbit Prototype Demonstration	C/CPFF	Various : Various : TBD	-	5.575	Nov 2020	3.967	Jan 2022	4.785	Jan 2023	-		4.785	Continuing	Continuing	-
Tetra-1 , 2, 3 & 4 Payload Integration into LDPE/ ROOSTER Ring	C/CPAF	Various : Various : TBD	-	-		0.018	Jan 2022	0.851	Jan 2023	-		0.851	Continuing	Continuing	-
Blackjack Development	MIPR	Various : Various : TBD	-	24.800	Nov 2020	-		-		-		-	0.000	24.800	-
Blackjack Assembly, Integration & Test	MIPR	Various : Various : TBD	-	1.400	Dec 2021	5.088	Jan 2022	2.500	Jan 2023	-		2.500	Continuing	Continuing	-
Blackjack Launch/Support Activities	MIPR	Various : Various : TBD	-	35.826	Nov 2020	9.150	Jan 2022	-		-		-	Continuing	Continuing	-
QZSS-HP Development	Various	Various : Various : TBD	-	27.878	Nov 2020	14.578	Oct 2021	13.468	Nov 2022	-		13.468	Continuing	Continuing	-
QZSS-HP Launch Support Activities	Various	Various : Various : TBD	-	-		0.917	Apr 2022	2.848	Nov 2022	-		2.848	Continuing	Continuing	-
Military Application of the Space Environment (MASE)	TBD	Not specified. : TBD	-	11.021	Feb 2021	-		-		-		-	0.000	11.021	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

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 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Space Combat Cloud	TBD	TBD: TBD : TBD	-	-		5.000	May 2022	-		-		-	0.000	5.000	-
Digital Engineering Ecosystem	Various	Not specified. : TBD	-	-		-		12.558	Jan 2023	-		12.558	Continuing	Continuing	-
Digital Engineering MITRE	TBD	Not specified. : TBD	-	-		-		1.520	Jan 2023	-		1.520	Continuing	Continuing	-
Technical Mission Analysis	Various	Various : Various : TBD	-	4.132	Nov 2020	3.554	Jan 2022	3.329	Jan 2023	-		3.329	Continuing	Continuing	-
Assault Breaker II	MIPR	Radiance Technologies : Huntsville, AL	-	5.000	Dec 2021	-		-		-		-	Continuing	Continuing	-
Subtotal			-	157.645		78.266		87.175		-		87.175	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
Digital Engineering Test Environment	TBD	Not specified. : TBD	-	-		-		5.000	Jan 2023	-		5.000	Continuing	Continuing	-
Subtotal			-	-		-		5.000		-		5.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
FFRDC	RO	Various : Various : TBD	-	2.391	Jan 2021	3.136	Jan 2022	3.558	Jan 2023	-		3.558	Continuing	Continuing	-
A&AS	Various	Various : Various : TBD	-	3.342	Feb 2021	4.963	Nov 2021	4.977	Nov 2022	-		4.977	Continuing	Continuing	-
Other Support	Various	Various : Various : TBD	-	0.418	Oct 2020	0.486	Nov 2021	0.389	Nov 2022	-		0.389	Continuing	Continuing	-
Subtotal			-	6.151		8.585		8.924		-		8.924	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force								Date: April 2022			
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>			
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	163.796	86.851	101.099	-	101.099	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force			Date: April 2022
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 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				
	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																													
Integration																													
Launch/Ops																													
LDPE-2																													
Integration																													
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																													
Integration																													
Launch/Ops																													
Tetra-3																													

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force **Date:** April 2022

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 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Development	█	█																										
Integration			█	█	█	█	█																					
Launch/Ops								█	█	█	█																	
Tetra-4																												
Development	█	█	█	█																								
Integration					█	█	█	█	█																			
Launch/Ops										█	█	█	█															
Tetra-5																												
Development					█	█	█	█	█	█	█	█																
Integration														█	█													
Launch/Ops																█	█	█	█									
Blackjack																												
Integration					█	█	█	█																				
Launch/Ops									█	█	█	█																
QZS 6-Hosted Payload																												
Development	█	█	█	█																								
Integration								█	█																			
Launch/Ops										█	█	█	█	█	█													
QZS 7-Hosted Payload																												
Development	█	█	█	█	█																							
Integration										█	█	█																
Launch/Ops													█	█	█	█	█											
MASE																												
Development		█	█																									
Space Combat Cloud																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force **Date:** April 2022

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 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Development																												
<i>DEICE Tech Stack</i>																												
Platform Compute and Store																												
Minimum Viable Product - Development																												
Increment 1																												
Increment 2-3																												
Increment 4-5																												
Increment 6-7																												
Increment 8																												
Integration & Operations																												
<i>Assault Breaker II</i>																												
Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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				
Integration	1	2021	4	2021
Launch/Ops	1	2022	1	2023
LDPE-2				
Integration	1	2021	2	2022
Launch/Ops	3	2022	3	2023
LDPE-3A				
Development & Integration	1	2021	4	2022
Launch/Ops	1	2023	1	2024
ROOSTER-4				
Development	3	2022	1	2024
Integration	2	2024	3	2025
Launch/Ops	4	2025	4	2027
ROOSTER-5				
Development	2	2024	3	2025
Integration	4	2025	3	2026
Launch/Ops	4	2026	4	2027
Tetra-1				
Launch/Ops	3	2022	3	2023
Tetra-2				
Development	4	2021	4	2022
Integration	1	2023	1	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force **Date:** April 2022

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
Launch/Ops	2	2024	2	2025
Tetra-3				
Development	1	2021	2	2021
Integration	3	2021	4	2022
Launch/Ops	1	2023	1	2024
Tetra-4				
Development	1	2021	2	2022
Integration	3	2022	1	2024
Launch/Ops	2	2024	2	2025
Tetra-5				
Development	3	2022	4	2024
Integration	1	2025	3	2025
Launch/Ops	4	2025	4	2026
Blackjack				
Integration	1	2022	4	2022
Launch/Ops	1	2023	2	2024
QZS 6-Hosted Payload				
Development	1	2021	4	2022
Integration	1	2023	3	2023
Launch/Ops	4	2023	4	2025
QZS 7-Hosted Payload				
Development	1	2021	1	2023
Integration	2	2023	1	2024
Launch/Ops	2	2024	4	2025
MASE				

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force **Date:** April 2022

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
Development	2	2021	4	2021
<i>Space Combat Cloud</i>				
Development	3	2022	4	2023
<i>DEICE Tech Stack</i>				
Platform Compute and Store	2	2023	4	2027
Minimum Viable Product - Development	2	2023	3	2023
Increment 1	4	2023	1	2024
Increment 2-3	2	2024	1	2025
Increment 4-5	2	2025	1	2026
Increment 6-7	2	2026	1	2027
Increment 8	2	2027	3	2027
Integration & Operations	4	2023	4	2027
<i>Assault Breaker II</i>				
Development	1	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force **Date:** April 2022

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
645611: <i>Assault Breaker II</i>	-	0.000	5.000	5.153	0.000	5.153	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).

In FY 2021, an Omnibus Above Threshold Reprogramming of \$5.000M is captured in Project 645601.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Assault Breaker II	-	5.000	5.153	0.000	5.153
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 2022 Plans: Classified details available upon request.					
FY 2023 Base Plans: Provide warfighter analysis, experiments, and development of modelling and simulation tools to support warfighting objectives established by DARPA.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	-	5.000	5.153	0.000	5.153

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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>

D. Acquisition Strategy
Funds are sent to DARPA via a Military Interdepartmental Purchase Request (MIPR).

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
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 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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	2022	4	2023