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

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206116SF / <i>Space Test and Training Range Development</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
Total Program Element	-	19.724	69.819	21.453	0.000	21.453	21.873	22.295	22.789	23.232	Continuing	Continuing
666156: <i>Space Test and Training Range Development</i>	-	19.724	69.819	21.453	0.000	21.453	21.873	22.295	22.789	23.232	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 Due to FY 2022 funds being applied to the incorrect line item in enactment, \$17.5M will be realigned to 0304369F/Cyber Capabilities Support Office from 1206116SF/Space Test & Training Range Development through an internal reprogramming. This change will be recorded in next year's Justification Documentation.

A. Mission Description and Budget Item Justification
 Supports the development of Space Test and Training Range (STTR) capabilities critical for developmental and operational test, training, exercises and tactics development for Space Control systems and Joint National Space Architecture. Includes development, demonstration and delivery of test assets, special test equipment, capabilities and systems required to test, validate, and verify performance of integrated space control systems. Provides a safe, secure, controllable and repeatable environment for the testing of space control mission systems and training operators in both realistic and relevant environments. Additionally, using an agile incremental development approach for range capabilities, this program develops test range assets for both the fixed node Space Range Operations Center (SROC) at Schriever Space Force Base and a deployable Signal Monitoring Unit capability to support complex Joint, AF and SF exercises. The virtual range as part of the Family of Systems (FoS), called Advanced Threat Simulation Environment (ATSE) virtual range, is being developed to accomplish the STTR mission. ATSE integrates to a Distributed Mission Architecture, tying into cyber, air, and space ranges for increased realism and complexity required to prepare space operators for real-world threats. This technology will allow for the first-ever use of a realistic signal environment to increase the realism and efficiency of space control squadron training. These risk reduction activities will include on-orbit capabilities, ground components, communication between nodes, and other required infrastructure.

The National Space Test and Training complex is the overarching complex designed to encompass all space test and training range needs to include cyberwarfare. STTR will function as the Electronic Warfare pillar (NSTTC-EW). The cyber warfare pillar will function as NSTTC-C.

Space acquisition must respond with speed and agility to emerging adversary threats. The Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

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

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This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	20.281	19.319	0.000	0.000	0.000
Current President's Budget	19.724	69.819	21.453	0.000	21.453
Total Adjustments	-0.557	50.500	21.453	0.000	21.453
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	50.500			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.557	0.000			
• Other Adjustments	0.000	0.000	21.453	0.000	21.453

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

Project: 666156: *Space Test and Training Range Development*

Congressional Add: *Cyber Training Range and Advanced Threat Simulation Environment*

Congressional Add Subtotals for Project: 666156

Congressional Add Totals for all Projects

	FY 2021	FY 2022
Congressional Add Subtotals for Project: 666156	0.000	50.500
Congressional Add Totals for all Projects	0.000	50.500

Change Summary Explanation

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. Congressional rescission of \$2.0M in FY2021.

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

	FY 2021	FY 2022	FY 2023
Title: Range Control	15.600	14.700	17.300
Description: Continue development of virtual range integration with cyber and air ranges hosting network emulators and other environments allowing tactics, techniques, and procedures (TTP) development, realistic operational testing, and enable more realistic exercises integrating joint air, space and cyber effects. Continue overhaul of fixed range capabilities, replacement of obsolete equipment, outdated servers, and performing software upgrades focusing on updating signal monitoring hardware with visualization tools and new monitoring capabilities and cybersecurity automation. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Acquire additional system capability to enable and enhance			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>training against new and emerging adversarial assets, to integrate mission scenarios into one graphic user interface, to develop transportable range operations center to provide flexible range control capability for multiple sites, to reduce size, weight, and power, and to replace software defined radio cards. Integrate joint DoD solutions for counterspace and space superiority effects.</p> <p>FY 2022 Plans: Develop new range future framework capability to integrate into the Joint Space Enterprise Architecture (JSpEA) to replace end-of-life equipment and aged software making up the Space Range Operations Center and signal monitoring units. Expand range mission to increase/enhance capabilities and operations to keep up with current and emerging space threats. Develop range to utilize a common baseline, common user interface (UI), and common tools to operate under a common system architecture. Integrate joint DoD solutions for counterspace and space superiority effects.</p> <p>Consolidate range into a single sustainable baseline for family of systems under the JSpEA. Continue development of virtual range integration with cyber and air ranges hosting network emulators and other environments allowing tactics, techniques, and procedures (TTP) development, realistic operational testing, and enable more realistic exercises combining air, space, and cyber effects. Continue Interim Contractor support (ICS) of virtual range.</p> <p>Additionally, FY 2022 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: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc.</p> <p>FY 2023 Plans: Continue development of a new range future framework capability to integrate into the JSpEA, expanding the range mission to increase/enhance capabilities and operations to keep up with current and emerging space threats. Continue range development to utilize a common sustainable baseline, common user interface (UI), and common tools needed to operate under a common system architecture. Continue to integrate joint DoD solutions for counterspace and space superiority effects.</p> <p>Continue risk reduction/mitigation efforts for Space Orbital Engagement Range to analyze, prototype and demonstrate potential range systems to support live testing of new advanced development space systems, space operator orbital engagement maneuvers (OEM) advanced training, and future SPACE FLAG exercises using live systems.</p> <p>Begin development of deployable range (DRange) capability to provide flexible range control in support of operational requirements. DRange capability will include monitoring, control and status, logging, for upgraded Deployable Signal Monitoring</p>				

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Units (D-SMU) operations. Development of a DRange prototype to demonstrate range control capabilities from operational locations. Additionally, FY 2023 funding will allow the program to 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: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased compared to FY 2022 due to development of deployable range control capability that can be used across multiple operational locations.			
Title: Management Services Description: A&AS, FFRDC, and other Program Office Support FY 2022 Plans: Management Services FY 2023 Plans: Management Services FY 2022 to FY 2023 Increase/Decrease Statement: Management Services	4.124	4.619	4.153
Accomplishments/Planned Programs Subtotals	19.724	19.319	21.453

	FY 2021	FY 2022
Congressional Add: Cyber Training Range and Advanced Threat Simulation Environment FY 2021 Accomplishments: N/A FY 2022 Plans: Support development of the National Space Test and Training Complex - Electronic Warfare (NSTTC - EW) which will provide a next-gen over-the-air and closed-loop environment to support the future EW systems and integrated warfighter training; Integrating both environments under the Joint Space Enterprise Architecture (JSpEA). Develop realistic threat-informed environments with cyber defense capabilities in partnership with Air Force Cyber Command (AFCYBER) and Defensive Cyber Ops-Space (DCO-Space) to support mission defense teams, cyber aggressors, and cyber test and evaluation units, and enable realistic	0.000	50.500

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	FY 2021	FY 2022
exercises at Space Flag and other events with cyber operators. Seed prototype space test and evaluation lab for cyber resiliency testing of space mission systems.		
Congressional Adds Subtotals	0.000	50.500

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

N/A

Remarks

E. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible.