Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 6: *RDT&E Management Support*					R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*							
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	-	119.231	93.617	107.706	-	107.706	69.131	74.814	91.919	95.157	Continuing	Continuing
983: *Reagan Test Site (RTS) T&E Investments*	-	6.051	6.378	6.844	-	6.844	8.364	4.199	8.359	8.440	Continuing	Continuing
984: *Major Developmental Testing Instrumentation*	-	47.985	38.027	43.861	-	43.861	33.384	26.653	30.434	33.116	Continuing	Continuing
986: *Major Operational Test Instrumentation*	-	11.840	29.441	4.623	-	4.623	-	4.636	4.251	4.250	Continuing	Continuing
EY9: *Range Radar Replacement Program (RRRP)*	-	52.340	18.687	50.065	-	50.065	26.239	38.183	47.731	48.196	Continuing	Continuing
FF1: *Cyber Blue Team*	-	1.015	1.084	2.313	-	2.313	1.144	1.143	1.144	1.155	0.000	8.998

A. Mission Description and Budget Item Justification

This funding line supports testing of Army Modernization Priority Programs.

This Program Element (PE) funds the development and acquisition of major developmental test instrumentation for the United States (U.S.) Army Test and Evaluation Command's (ATEC) test activities: White Sands Test Center (WSTC), New Mexico; Yuma Test Center (YTC), Arizona; Aberdeen Test Center (ATC), Maryland; Electronic Proving Ground (EPG), Arizona; Redstone Test Center (RTC), Alabama; and for the Reagan Test Site (RTS) at the United States Army Kwajalein Atoll (USAKA), which is managed by the Space and Missile Defense Command. This PE also funds development and acquisition of Operational Test Command's (OTC) major field instrumentation and beginning in Fiscal Year 2020, management of the Cyber Acquisition Blue Teams (CABT) certification standards. Requirements for instrumentation and cyber certifications are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	119.231	68.139	0.000	-	0.000
Current President's Budget	119.231	93.617	107.706	-	107.706
Total Adjustments	0.000	25.478	107.706	-	107.706
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	25.600			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	107.706	-	107.706
• FFRDC Transfer	-	-0.122	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 984: *Major Developmental Testing Instrumentation*		
Congressional Add: *Radio frequency threat systems emulator for rotary wing aircraft*	5.000	-
Congressional Add Subtotals for Project: 984	5.000	-
Project: 986: *Major Operational Test Instrumentation*		
Congressional Add: *Major operational test instrumentation*	11.840	25.600
Congressional Add Subtotals for Project: 986	11.840	25.600
Congressional Add Totals for all Projects	16.840	25.600

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) 983 / *Reagan Test Site (RTS) T&E Investments*	

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
983: *Reagan Test Site (RTS) T&E Investments*	-	6.051	6.378	6.844	-	6.844	8.364	4.199	8.359	8.440	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds improvement and modernization (I&M) for the Ronald Reagan Ballistic Missile Defense Test Site (RTS) instrumentation systems. The Reagan Test Site with its remote location and one of kind instrumentation systems provides a strategic test environment that cannot be replicated. In order to continue its critical mission of testing missile systems that are of paramount importance to the defense of the nation, the RTS instrumentation systems must be continuously updated and upgraded to support the emerging technologies being developed by the Department of Defense (DOD) such as hypersonics and other advanced weapons systems. Without modernization, these instrumentation systems face obsolescence or degraded capability and the inability to provide the critical data needed for continued materiel development. Without instrumentation on par with the technologies being utilized in emerging systems, the materiel developer will be unable to complete their test programs or pass programmatic milestones toward deployment. These funds provide modernization of the radar, telemetry, optics, range safety, communications, command/control and other equipment essential to meet test and evaluation requirements of the Services and DoD agencies. The RTS instrumentation is required to support data collection for test & evaluation assessments and operational decisions that have strategic implications for the Army, Navy, Air Force, United States Strategic Command (STRATCOM), Missile Defense Agency (MDA), Defense Advanced Research Projects Agency (DARPA), National Aeronautics and Space Administration (NASA), and other customers. RTS, located in the Republic of the Marshall Islands, is a remote, secure activity of the Major Range and Test Facility Base (MRTFB). Funding will enable RTS to meet customer objectives and sustain the required instrumentation suite.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Radar Reliability Improvement Program (RRI).	0.500	0.500	0.551
Description: The Radar Improvement and Sustainment (RIS) activity is an Improvements and Modernizations (I&M) Umbrella Program to push technology into radar systems. RIS is a group of complimentary I&M Projects that mitigate annual Operations and Maintenance (O&M) risks. Projects initiated address the following needs: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring; Fault Detection - Fault Isolation (FD/FI); Enable Remote Operation and Monitoring; and Enhanced Capabilities.			
FY 2022 Plans: RRI Program will continue as an I&M umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities.			
FY 2023 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 983 / *Reagan Test Site (RTS) T&E Investments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
RRI Program will continue as an I&M Umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase is due to inflation.			
Title: Telemetry (TM) Modernization Study. ***Description:*** This activity will develop the technology required to modernize the telemetry systems using an innovative software defined radio approach designed to vastly improve the ability to adapt to future telemetry changes and requirements quickly with lower cost. In addition, this approach will enable centralized command and control of the telemetry equipment increasing efficiency in mission preparation and execution. The telemetry back-end processing chain is currently comprised of discrete frequency-specific hardware components that are replicated for each telemetry channel required for a test event. This activity will develop a scalable frequency-agnostic, software-based solution that runs on commodity computer servers. More complex missions (e.g., Over-the-air (OTA) operational testing of the Ballistic Missile Defense Systems (BMDS)) will continue to require more telemetry channels, but this activity will avoid much of that future cost. This effort will provide enough hardware to increase capacity of the telemetry system. ***FY 2022 Plans:*** Continuation of V&A testing effort focusing on engineering test for the full-up capability and deployment of the modernized telemetry equipment to the other TM sites within RTS range (Kwaj, Illegini, & Gagan Islands). ***FY 2023 Plans:*** TM Modernization should complete in FY23; the component will utilize the requested funds for wrap up efforts. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to inflation.	2.500	1.221	1.251
Title: Legacy Servo Upgrade Program. ***Description:*** This activity will design, upgrade, and replace the radar and optics servo systems. The custom-hardware based legacy systems will be replaced with commercially supportable commercial off the shelf (COTS) hardware. Where possible, common components will be used across all range sensors to minimize ongoing maintenance costs. ***FY 2022 Plans:***	0.108	0.391	2.201

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 983 / *Reagan Test Site (RTS) T&E Investments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Assessment of remaining antenna servo systems and determine next highest priority servo replacement need and initiate engineering design activities for the next phase of the program. ***FY 2023 Plans:*** Continue assessment of antenna servo systems and continue engineering design activities for the next phase of the program. Prototyping and testing of new servo methodologies will be implemented as well. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase from FY22 to FY23 is due to ramping up the program to ensure future radar operability by replacing antiquated servos. Includes the removal of FFRDC in the amount of $109K.			
Title: RTS Range Enhancements for Hypersonic Vehicle Testing ***Description:*** The Range Enhancements for Hypersonic Vehicle Testing program will develop and deploy advanced technologies and a number of infrastructure upgrades specific to hypersonic vehicle testing. These technologies and infrastructure improvements include advanced non-ballistic tracking enhancements, improved data collection, additional waveform support, sensor surrogate capabilities and integration of adjunct sensors to support situational awareness and future tracking enhancements. ***FY 2022 Plans:*** Continue maturing and deploying enhanced tracking algorithms to the RTS sensor suite ***FY 2023 Plans:*** Continue maturing and deploying enhanced tracking algorithms to the RTS sensor suite and planning & support for experimentation & testing in space. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY22 to FY23 is due to balancing of range resourcing needs.	0.100	0.432	0.401
Title: Digital Focal Plane Array (DFPA) Technology Insertion ***Description:*** DFPA Technology Insertion program designs, builds, and integrates DFPA-based camera systems and other leading-edge imaging technologies into existing Super Recording Automatic Digital Optical Tracker (RADOT) mounts at RTS. The cameras and telescopes will provide coverage in multiple imaging bands including Middle Wave Infra-Red (MWIR) and Long Wave Infra-Red (LWIR). ***FY 2022 Plans:***	0.040	0.441	0.581

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 983 / *Reagan Test Site (RTS) T&E Investments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Procure and deploy additional DFPA based cameras at SR Optics site ***FY 2023 Plans:*** Installation and test of IR cameras; work RMF accreditation package for cyber security; IV&V; test system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase from FY22 to FY23 is due to installation, checkout, documentation, and testing of system.			
Title: Radar Open System Architecture (ROSA) Refresh ***Description:*** ROSA initial concept and implementation subdivided each of the RTS radars into logical and separable functional building blocks. Up to nine common subsystems including receivers, transmitters and antenna controls were designed using Commercial Off the Shelf (COTS) equipment to provide a unified framework, largely eliminating the very unique and custom hardware and software at each of the RTS radars. Over a decade of technology advancement and further maturity of industry standards have outdated the current ROSA implementation, posing a sustainability problem. This program will identify key subsystem technologies and architectures to stabilize future procurement, maintenance and operational capability across all RTS radars. ***FY 2022 Plans:*** Continue to maintain and increase the operability of RTS capabilities across all KREMS radars. ***FY 2023 Plans:*** Continue to maintain and increase the operability of RTS capabilities across all KREMS radars. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decreased due to funds reallocated to higher priorities.	2.000	2.000	0.251
Title: TRADEX L-Band High Voltage Power Supply Upgrade ***Description:*** TRADEX L-Band High Voltage Power Supply Upgrade will improve resilience of L-band by providing a backup power supply and a test stand where tubes can be tested without impacting the operational system. ***FY 2022 Plans:*** Continue to upgrade the unregulated supply components that are obsolete and a single point of failure for the TRADEX radar with a modern solid state power supply technology which would replace the legacy power supply, modulator, crowbar and capacitor bank. ***FY 2023 Plans:***	0.803	0.200	0.552

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 983 / *Reagan Test Site (RTS) T&E Investments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Wrap up documentation, installation, and test of new L-band High Voltage power supply for the TRADEX radar. Project completion has been delayed due to COVID-19 and supplier production issues. System should be fully operational and RMF compliant in FY23. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to inflation and receiving additional funds to support this requirement.			
Title: MPS-36 Infrastructure Refresh ***Description:*** MPS-36 radars are quite old and decaying due to corrosion because of proximity to Pacific Ocean as well as normal wear and tear. This project is to replace outdoor infrastructure related to the MPS-36 radars: dish, pedestal, wiring, connectors, LNA, and other components as required. Upgrade to newer materials and technologies to improve performance and longevity. ***FY 2022 Plans:*** Begin multi-year infrastructure repair & refresh with inspections & study of existing issues, and begin to replace most critical items. ***FY 2023 Plans:*** Replace corroded and decayed components to restore functionality and maintainability. Begin work to upgrade/replace RF components and computer hardware that controls the RF sub-systems. Multi-year infrastructure repair & refresh with inspections & study of existing issues, and begin to replace most critical items. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to inflation and receiving additional funds to support this requirement.	-	0.956	1.056
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** SBIR/STTR Transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638	-	0.237	-
Accomplishments/Planned Programs Subtotals	6.051	6.378	6.844

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 983 / *Reagan Test Site (RTS) T&E Investments*

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) 984 / *Major Developmental Testing Instrumentation*	

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
984: *Major Developmental Testing Instrumentation*	-	47.985	38.027	43.861	-	43.861	33.384	26.653	30.434	33.116	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project develops and acquires major test instrumentation to perform developmental testing of weapon systems at United States Army Test and Evaluation Command's (ATEC) activities which include: Yuma Test Center (YTC), AZ; Aberdeen Test Center (ATC), MD; Electronic Proving Ground (EPG), AZ; White Sands Test Center (WSTC), NM; Redstone Test Center (RTC), AL; Cold Regions Test Center (CRTC), AK.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium high), schedule risk, cost (greater than $1.500 Million per year or $7.500 Million for the total Project) and applicability to other mission areas or services. These Projects are technically demanding, state of the art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team.

Test Network Modernization (TNM) will upgrade existing test data networks to ensure infrastructures are capable of providing reliable and secure transport of data and communications for ATEC test activities. Applied Environments Modernization (AEM) program will upgrade antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights. Robotics/Unmanned Aerial Systems (R/UAS) Instrumentation Suite will develop and procure instrumentation for testing controlled and autonomous ground and aerial robotic systems. System of Systems Cooperative Engagement Test Infrastructure (SCETI) will provide for the development of systems to conduct systems-level Manned-Unmanned Teaming (MUM-T) testing for both aircraft and ground systems in a distributed environment. ATEC Fiber Modernization will provide all ATEC Test Centers with a revitalized fiber network to complement the TNM program. Due to limited commercial infrastructure, the cold regions provide a difficult climate for network connectivity. Therefore, both TNM and AFM's ability in resourcing an edge capability along with providing a permanent fiber backbone on Army test ranges is critical to ensuring advanced weapon systems operate flawlessly in extreme cold environments. Telemetry Systems Modernization (TSM) will modernize outdated telemetry systems with new equipment designed to enhance the technical and spectral capabilities currently available. This new telemetry equipment will also provide for a remote controlled operational environment. In support of the National Defense Strategy, each of these programs supports the following Army Cross Functional Teams: Long Range Precision Fires, Next Generation Combat Vehicle and Future Vertical Lift.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: EMD phase contract activity of the Test Network Modernization.	12.545	12.725	16.631
Description: Engineering, Manufacturing, and Development (EMD) phase contract activity for the Test Network Modernization. This effort will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for Aberdeen Test Center (ATC), Electronic Proving Ground (EPG), Redstone Test Center (RTC), White Sands Test Center (WSTC),			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 984 / *Major Developmental Testing Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Yuma Proving Ground (YPG), and Cold Regions Test Center (CRTC). This effort applies an enterprise solution to replace end-of-life equipment with the purpose of improving and providing the capability to support future network/data throughput demands consistent with operations and cybersecurity requirements. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams. ***FY 2022 Plans:*** The Test Network Modernization effort will continue in the engineering and manufacturing phase. FY 2022 funds in the amount of $12.725 Million will continue the standardization of the network that allows modern monitoring, tracking, and troubleshooting of network issues and failure points. ***FY 2023 Plans:*** The Test Network Modernization effort will continue in the engineering and manufacturing phase. FY 2023 funds in the amount of $16.631 Million will continue the standardization of the network that allows modern monitoring, tracking, and troubleshooting of network issues and failure points. Test Centers with high customer demands, such as White Sands Test Center and Yuma Test Center will also be receiving fiber optic network Dense Wavelength Division Multiplexing (DWDM) upgrades to address end of life equipment issues. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 increase in funding is required to obtain the network equipment identified during market research for all ATEC test centers.			
Title: EMD for the Applied Environments Modernization.	10.267	5.698	7.755
Description: EMD phase contract activity for the Applied Environments Modernization program. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, Air and Missile Defense Cross-Functional Teams. ***FY 2022 Plans:*** Will continue EMD phase for Applied Environments Modernization program. In FY 2022 funds in the amount of $5.698 Million will be used to continue with the procurement of a Rain and Wind Facility, Temperature, Altitude, Humidity, and Decompression Chamber, Portable Field Refrigeration unit, and Multi-Use Conditioning Chambers at Yuma Test Center (YTC) and a Replacement Temperature Humidity Chamber at Redstone Test Center (RTC). ***FY 2023 Plans:*** Will continue EMD phase for Applied Environments Modernization program. In FY 2023 funds in the amount of $7.755 Million will be used to continue with the purchase of equipment utilized for testing environmental effects at Yuma Test Center (YTC) and Redstone Test Center (RTC). Specific equipment to be upgraded in FY2023 includes: Temperature & Altitude Conditioning			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 984 / *Major Developmental Testing Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Chamber, Large Temperature Conditioning Shroud, High Energy X-Ray Tube System and Large Portable Temperature Conditioning System. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 increase in funds due to more refined estimates.			
Title: EMD phase contract activity for Robotics/UAS Instrumentation Suite ***Description:*** EMD phase of Robotics/Unmanned Autonomous System (UAS) Instrumentation Suite for testing controlled and autonomous ground and aerial robotic systems. This effort supports Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams. ***FY 2022 Plans:*** Funds in the amount of $6.569 Million will continue with the acquisition of instrumentation hardware and sensor suite equipment needed for testing controlled and autonomous ground and aerial robotic systems at Aberdeen Test Center. ***FY 2023 Plans:*** Funds in the amount of $7.163 Million will continue with the acquisition of instrumentation hardware and sensor suite equipment needed for testing controlled and autonomous ground and aerial robotic systems at Aberdeen Test Center. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 increase in funds is required for additional equipment identified during acquisition refinement.	6.263	6.569	7.163
Title: EMD phase contract activity for ATEC Fiber Modernization ***Description:*** ATEC Fiber Modernization will provide all ATEC Test Centers with a revitalized fiber network to complement the Test Network Modernization (TNM) program. This effort provides test centers with an improved fiber infrastructure to support greater data payloads and increased network reliability. This enterprise effort will replace fiber optic cable at the test centers to extend the lifecycle of the test networks. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Network, Air and Missile Defense and Future Vertical Lift Cross-Functional Teams. ***FY 2022 Plans:*** Funds in the amount of $5.225 Million will continue the market research for revitalization of the network and further refine the acquisition strategy for replacement of fiber network at all ATEC test centers. ***FY 2023 Plans:***	0.963	5.225	5.585

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 984 / *Major Developmental Testing Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funds in the amount of $5.585 Million will used to continue the acquisition of hardware needed to revitalize and replace the fiber network at all ATEC test centers. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 increase in funds is due to refinement of necessary equipment identified during acquisition strategy refinement.			
Title: EMD phase contract activity for Telemetry Systems Modernization ***Description:*** Telemetry Systems Modernization will modernize current outdated telemetry systems located at: White Sands Test Center (WSTC), Yuma Test Center (YTC) , Aberdeen Test Center (ATC) and Redstone Test Center (RTC). Telemetry systems are a core capability for supporting testing under ATEC for airborne and both manned & unmanned ground vehicles. The modernization of these systems will provide enhanced technical and spectral capability while also providing for a remote controlled operational environment. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Air and Missile Defense, and Future Vertical Lift Cross-Functional Teams. ***FY 2022 Plans:*** Funds in the amount of 6.422 Million will continue with replacement of obsolete Telemetry system components at Redstone Test Center, Yuma Test Center and White Sands Test Center. This replacement will include Commercial Off The Shelf (COTS) fixed site and mobile telemetry equipment. ***FY 2023 Plans:*** Funds in the amount of $6.727 Million will continue with replacement of obsolete Telemetry system components at Redstone Test Center, Yuma Test Center and White Sands Test Center. This replacement will include Commercial Off The Shelf (COTS) fixed site and mobile telemetry equipment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 increase in funds is due to refinement of necessary equipment identified during acquisition strategy refinement.	7.859	6.422	6.727
Title: EMD phase contract activity for System of Systems Controlled Environment Test Infrastructure (SCETI) ***Description:*** EMD phase for System of Systems Cooperative Engagement Test Infrastructure (SCETI). This effort supported the Future Vertical Lift Cross-Functional Team.	5.088	-	-
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	1.388	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 984 / *Major Developmental Testing Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding transferred in accordance with Title 15 USC ?638.			
Accomplishments/Planned Programs Subtotals	42.985	38.027	43.861

	FY 2021	FY 2022
Congressional Add: Radio frequency threat systems emulator for rotary wing aircraft	5.000	-
FY 2021 Accomplishments: Congressional Add funding in the amount of $5 million dollars for the Major Operational Test Instrumentation of the radio frequency threat system emulator for rotary wing aircraft.		
Congressional Adds Subtotals	5.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) 986 / *Major Operational Test Instrumentation*	

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
986: *Major Operational Test Instrumentation*	-	11.840	29.441	4.623	-	4.623	-	4.636	4.251	4.250	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the development, acquisition, and integration of major operational test instrumentation for the U.S. Army Test and Evaluation Command's Operational Test Command and supporting test activities at test and training ranges. Requirements for instrumentation are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Project focus is to address Director Operational Test and Evaluation (DOT&E)-identified Army test realism shortfalls.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than $1.500 million per year or $7.500 million for the total project) and applicability to other mission areas or services. These projects are technically demanding, state-of-the-art, unique instrumentation assets or suites to meet technology shortfalls, and generally result from development programs managed by a professional project management team.

The DOT&E annual report to Congress identified shortfalls in the Army's abilities to create realistic operational environments. The Exportable Live Virtual Constructive Command Center (XLCC)(formerly called the Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE)) project will address multiple shortfalls identified by DOT&E. XLCC is a portfolio of related development efforts that will deliver a system of systems to provide a Real-Time Casualty Assessment (RTCA) and instrumentation suite that delivers a high fidelity, realistic, real-time capability to measure hardware and personnel performance in modern combat environments. XLCC will enable testing under tactical conditions for small and large-scale operations while integrating network operations and effects in support of the Army Equipment Modernization Plan. XLCC also allows the U.S. Army to test all Current-to-Future weapon systems in a realistic operational environment. XLCC will transition Research, Development, Test and Evaluation (RDTE) developed performance enhancements and technology upgrades to the operational test command, control, and communications, communications network, weapons system interfaces, vehicle and dismounted-troop kits and peripherals, Global Positioning System (GPS), encryption components, and integrate operational realistic digital battlefield data collection and analysis tools. These tools will collect, store and analyze data from the digital battlefield. Improvements will enable the XLCC system of systems to measure and record accrued damage, levels of exposure, effects of countermeasures, evasive action, and instrument threat vehicles. This capability is required by the operational test community to integrate digital battlefield data collection and analysis tools to support Project Convergence, Army Modernization priorities and other operational tests.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Exportable Live Virtual Constructive Command Center (XLCC)	-	3.701	4.623
Description: Funds the development, acquisition, and integration of major operational test instrumentation for the U.S. Army Test and Evaluation Command's Operational Test Command and supporting test activities at test and training ranges.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 986 / *Major Operational Test Instrumentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Develop and integrate the Exportable Live Virtual Constructive Command Center (XLCC) System of Systems with capability to perform real-time casualty assessment (RCTA), create operational realistic test environments, collect test data, command and control the test environment, and integrate with other systems and tools. ***FY 2023 Plans:*** Funds in the amount of $4.623 Million will create operational realistic test environment and integrate with other systems and tools; update Real Time Casualty Assessment and fair-fight methodologies and provide data analytics to the test community; integrate and provide initial interoperability with current and future Multi-Domain Operations (MDO) range threats (e.g. Threat Battle Command Force and Intelligence Electronic Warfare Tactical Proficiency Trainer) through development of Test and Evaluation Network Architecture (TENA) Gateways; provide continuous SW/HW updates to allow flexibility and modularity in system capabilities in order to deploy XLCC to a multitude of ranges and test sites. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2022 to FY 2023 funding increase supports the integration of existing Army drone capabilities and modification of Exportable Live Virtual Constructive Command Center (XLCC) software needed for Operational Test Command (OTC) to support near term test of Counter small Unmanned Aerial System (C-sUAS). Program name change in FY 2022 from ILTE to XLCC.			
Title: SBIR/STTR ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	0.140	-
Accomplishments/Planned Programs Subtotals	-	3.841	4.623

	FY 2021	FY 2022
Congressional Add: Major operational test instrumentation	11.840	25.600
FY 2021 Accomplishments: T&E Investment to advance hardware and software to properly conduct operational testing on 31 Army modernization efforts in development by Army Futures Command. Adds near-peer threat live, virtual, and constructive components (ideally reconfigurable/programmable threat simulators and simulations) that will operate within the Integrated Live-Virtual-Constructive Test Environment (ILTE) real-time simulation, test control, and data architectures for network communications and processing. Will enhance Real Time Casualty Assistance (RTCA) simulation that includes kinetic weapons as well as directed		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** 986 / *Major Operational Test Instrumentation*

	FY 2021	FY 2022
energy weapons, electronic warfare, cyber operations, and a converged EW/Cyber capability. Will integrate constructive simulation to augment single, one-on-one RTCA effects calculation as well as replicating supporting systems-of-systems via high-fidelity modeling. ***FY 2022 Plans:*** T&E Investment to advance hardware and software to properly conduct operational testing on 31 Army modernization efforts in development by Army Futures Command. Adds near-peer threat live, virtual, and constructive components (ideally reconfigurable/programmable threat simulators and simulations) that will operate within the Exportable Live Virtual Constructive Command Center (XLCC) (formerly Integrated Live-Virtual-Constructive Test Environment (ILTE)) real-time simulation, test control, and data architectures for network communications and processing. Will enhance Real Time Casualty Assistance (RTCA) simulation that includes kinetic weapons as well as directed energy weapons, electronic warfare, cyber operations, and a converged Electronic Warfare/Cyber capability. Will integrate constructive simulation to augment single, one-on-one RTCA effects calculation as well as replicating supporting systems-of-systems via high-fidelity modeling. Upgrade electronic range infrastructure for simulation, data exchange and instrumentation required. Prototype threat assets capable of emulating synchronized joint effects Integrate high fidelity simulations; and kinetic and non-kinetic RTCA effects. Support test events for: Artificial Intelligence (AI), Ground Combat, Future Vertical Lift (FVL), Command and Control (C2) and Integrated Cyber, Electronic Warfare and Kinetic Operations.		
Congressional Adds Subtotals	11.840	25.600

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) EY9 / *Range Radar Replacement Program (RRRP)*	

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
EY9: *Range Radar Replacement Program (RRRP)*	-	52.340	18.687	50.065	-	50.065	26.239	38.183	47.731	48.196	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In order to effect strategic overmatch on current and future battlefields, it is essential that the United States (U.S.) Army provide advanced radar system instrumentation for developmental testing. Since existing range radar instrumentation is aged beyond useful life and cannot adequately support emerging test requirements, the Range Radar Replacement Program (RRRP) recapitalizes and develops modern instrumentation radars to replace obsolete tracking and surveillance radars at U.S. Army Test and Evaluation Command's (ATEC) activities, which include: Aberdeen Test Center (ATC), MD; White Sands Test Center (WSTC), NM; and Yuma Test Center (YTC), AZ. The project will deliver capability in two block increments: Block I will recapitalize or replace existing radar systems, and Block II will develop a Long Range Radar which is compliant with ATEC's Test Capability Requirements Document (TCRD). The acquisition of modern instrumentation radar systems will provide the Army with critical testing data essential for the development of next generation technology and advanced system capabilities. The RRRP provides the test centers with improved radar resolution, sensitivity, accuracy, clutter suppression, and reliability. The planned solution to meet program requirements consists of four primary items: Long Range Single Object Tracking Radars (SOTR), Long Range Multiple Object Tracking Radars (MOTR), Medium Range Radars (MRR), and Short Range Radars (SRR). The resulting systems will not only reduce operation and sustainment costs for the ranges, but will improve data collection, thus enhancing development of Army systems being tested at these ranges. The current fleet of instrumentation radars located at ATC, WSTC, and YTC has become antiquated to the extent that they are not able to support the test needs of the test centers.

This Project will procure Modified Commercial Off-the-Shelf (MCOTS) radars for both the MRR and SRR solutions, and a combination of recapitalization and MCOTS replacement for the Long Range SOTRs. Also, the project will conduct Engineering and Manufacturing Development (EMD) for upgrading three Long Range MOTRs.

FY23 in the amount of $50.065M provides funding for final two Block I LRR contract, continued testing and acceptance costs of remaining Block I radars to include Medium, Long Range and MPS-39 MOTR instrumentation radars, and funds the Block II ECP with continued development of Block II radars.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: EMD Phase	52.340	18.005	50.065
Description: The Fiscal Year (FY) 2023 request of $50.065 million continues delivery and acceptance testing of Medium, Long Range, and MPS-39 MOTR instrumentation radars and continues development of the first Block II Long Range radar prototype.			
FY 2022 Plans: Continue development of the first Block II Long Range radar prototype, and continue acceptance testing of Medium Range, Short Range and MPS-39 MOTR instrumentation radars.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** EY9 / *Range Radar Replacement Program (RRRP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
SBIR/STTR $682K. ***FY 2023 Plans:*** Continue development of the first Block II Long Range radar prototype, and acceptance testing of Medium, Long Range, and MPS-39 MOTR instrumentation radars. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase is consistent with the strategic plan to align RRRP with developmental testing requirements emerging from Army modernization efforts; this also will support the Range Radar Replacement Program's (RRRP) Block II LRR development and schedule. .			
Title: FY22 SBIR/STTR Transfer ***Description:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 Plans:*** FY22 $682K transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	0.682	-
Accomplishments/Planned Programs Subtotals	52.340	18.687	50.065

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) FF1 / *Cyber Blue Team*	

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
FF1: *Cyber Blue Team*	-	1.015	1.084	2.313	-	2.313	1.144	1.143	1.144	1.155	0.000	8.998
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In 2016 the Army Acquisition Executive (AAE) designated the Program Manager for Cyber, and Training (PM CT2) (formerly PM ITTS) as the Office of Primary Responsibility for Cyber Acquisition Blue Teams (CABT) certifications and standards program. This Project executes the establishment and management of certification standards for CABT and coordination of requirements on behalf of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA (ALT)).

PM CT2 will establish certification standards, certify Blue Teams and maintain a vulnerabilities/lessons learned repository. PM CT2 will work with Blue and Red Teams to establish processes which facilitate open network tests under the red team authority, coordinate with Program Managers on CABT efforts on behalf of ASA (ALT) and report to ASA (ALT) on new cyber vulnerabilities. Blue teams will work cooperatively with acquisition programs to make sure all security measures are taken throughout the program's lifecycle, ensuring cyber resiliency. Blue teams are essential to help military operators assess, protect and defeat the presence of cyber security threats across Army Acquisition Programs.

Will focus on the continuation of certifying candidate teams. The goal is to certify enough teams to allow acquisition programs the flexibility to find a certified Blue Team that meet their program's schedule and cost and can be incorporated early on in the program. CABT vulnerability assessments will provide data analytics to report trends and lessons learned. A web portal will serve as a one stop shop for both candidate and certified Blue teams to obtain and maintain their certification.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cyber Blue Teams	1.015	1.044	2.313
Description: Management and oversight of Cyber Blue Team vulnerability assessments.			
FY 2022 Plans: Will continue to support the maintenance and operation of a central repository to include trend analysis and lessons learned from vulnerability assessments. The CABT program will also develop and maintain an additional web portal to support and manage both the candidate and the certified teams.			
FY 2023 Plans: The funding provides the ability to continue certification of Army Acquisition and Modernization Cyber Assessment Teams (AAMCATs) as well as support the operation and maintenance of an AAMCAT web portal and central repository to include trend analysis and lessons learned from engineering risk reduction assessments.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** FF1 / *Cyber Blue Team*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY2022 to FY2023 increase is for the ability to certify additional AAMCATs within the FY as well as support and oversee the increasing volume of AAMCATs.			
Title: SBIR/STTR ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	0.040	-
Accomplishments/Planned Programs Subtotals	1.015	1.084	2.313

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A