Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army											Date: February 2016	
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 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	-	54.281	66.580	84.777	-	84.777	71.037	64.819	67.715	68.983	-	-
983: *Reagan Test Site (RTS) T&E Investments*	-	5.687	7.529	7.032	-	7.032	7.096	7.287	7.335	7.529	-	-
984: *Major Developmental Testing Instrumentation*	-	46.139	52.093	31.741	-	31.741	39.948	41.898	44.552	45.394	-	-
986: *Major Operational Test Instrumentation*	-	2.455	6.958	17.971	-	17.971	18.993	15.634	15.828	16.060	-	-
EY9: *Range Radar Replacement Program (RRRP)*	-	0.000	0.000	26.333	-	26.333	0.000	0.000	0.000	0.000	-	-
FA4: *Warrior Injury Assessment Manikin (WIAMan)*	-	0.000	0.000	1.700	-	1.700	5.000	0.000	0.000	0.000	-	-

Note

In FY17 Range Radar Replacement Program (RRRP)was realigned within this Army Program Element 0604759A, from Project 984/Major Developmental Testing Instrumentation to Project EY9/Range Radar Replacement Program (RRRP).

FY17 funding for WIAMan resulted from a realignment of funds from Project 984, APE 0604759A.

A. Mission Description and Budget Item Justification

This program funds the development and acquisition of major developmental test instrumentation for the U.S. Army Test and Evaluation Command's (ATEC) test activities: White Sands Test Center (WSTC), NM; Yuma Test Center, (YTC), AZ; Aberdeen Test Center (ATC), MD; Electronic Proving Ground (EPG), AZ; Redstone Test Center (RTC), AL; and for the Reagan Test Site (RTS) at the U.S. Army Kwajalein Atoll (USAKA), which is managed by the Space and Missile Defense Command. The program also funds development and acquisition of Operational Test Command's (OTC) major field instrumentation. 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. Army testing facilities are also surveyed to determine major testing capability shortfalls.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	56.285	62.580	55.243	-	55.243
Current President's Budget	54.281	66.580	84.777	-	84.777
Total Adjustments	-2.004	4.000	29.534	-	29.534
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.013	-			
• SBIR/STTR Transfer	-1.991	-			
• Adjustments to Budget Years	-	-	29.534	-	29.534

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 984: *Major Developmental Testing Instrumentation*		
Congressional Add: *Congressional Add for Cyber Vulnerabilities Research*	-	4.000
Congressional Add Subtotals for Project: 984	-	4.000
Congressional Add Totals for all Projects	-	4.000

Change Summary Explanation

FY 2017 Budget adjustments in the amount of $29.534 million dollars was the result of a change in Army Test Evaluation Center's (ATEC) priority of requirements. Range Radar Replacement Program (RRRP), was increased by $23.090 million to continue Engineering Manufacturing Development (EMD) based on modifications in FY 2016 for the Fly-out and Close-in Radars systems in preparation for replacement of equipment at Aberdeen Test Center (ATC), Redstone Arsenal Center (RTC), White Sands Test Center (WSTC), and Yuma Test Center (YTC). Real Time Casualty Assessment (RTCA), also known as Integrated Live Virtual Constructive Test Environment (ILTE), was increased by $7.000 million to continue the development of hardware, software, interfaces, and new capabilities to ensure RTCA/ILTE requirements for upcoming operational tests are satisfied. The remainder of the Adjustments to Budget Years ($-556K) represents top loaded inflation rate adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
983: *Reagan Test Site (RTS) T&E Investments*	-	5.687	7.529	7.032	-	7.032	7.096	7.287	7.335	7.529	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Programs ending in FY 2016: Mission Data Network Modernization, TRADEX L-Band Modulator, Multiple Simultaneous Engagement (MSE) Flight Safety, Net Centric Operations Upgrade, and Optics Focal Plane Tech Replacement Study.

A. Mission Description and Budget Item Justification

This activity funds improvement and modernization (I&M) for the Ronald Reagan Ballistic Missile Defense Test Site (RTS). Funds 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. Without modernization these instrumentation systems face obsolescence or degraded capability. The RTS instrumentation is required to support data collection for test & evaluation assessments and operational decisions for the Army; Navy; Air Force; U.S. Strategic Command (STRATCOM); Missile Defense Agency (MDA); Defense Advanced Research Projects Agency (DARPA); National Aeronautics and Space Administration (NASA); and other customers. Reagan Test Site (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 continue to meet customer objectives and sustain the required instrumentation suite.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Radar Open Systems Architecture Refresh	0.100	-	0.600
Description: Funding is provided for the following effort. ***FY 2015 Accomplishments:*** Design and development of modern, open subsystems to replace unsupported subsystem hardware for the Kiernan Reentry Measurement System (KREMS) radar sites. ***FY 2017 Plans:*** Continue design and development of open systems with a focus on extending the design to work with phased array radar systems in addition to the Kiernan Reentry Measurement System (KREMS) radar sites.			
Title: Radar Reliability Improvement Program (RRI).	0.337	0.278	0.300
Description: Funding is provided for the following effort ***FY 2015 Accomplishments:***			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Continued execution of projects to increase reliability and lower operating costs of RTS radars by incorporating modern commercially available parts into radar systems when legacy parts are obsolete and a drop in replacement is not available. ***FY 2016 Plans:*** Continue execution of projects to increase reliability and lower operating costs of RTS radars by incorporating modern commercially available parts into radar systems when legacy parts are obsolete and a drop in replacement is not available. ***FY 2017 Plans:*** Will continue execution of projects to increase reliability and lower operating costs of RTS radars by incorporating modern commercially available parts into radar systems when legacy parts are obsolete and a drop in replacement is not available.			
Title: Telemetry (TM) Modernization Study. ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Design and begin implementing a telemetry system based on an open system architecture with a software defined radio approach. ***FY 2016 Plans:*** Implement software defined radio design with a modernized frequency agile receiver on one antenna at RTS. ***FY 2017 Plans:*** Extend implementation to multiple antenna sites at RTS.	1.822	1.804	2.310
Title: Multiple Simultaneous Engagement (MSE) Flight Safety. ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Continue design and implementation of RTS safety control system replacement. ***FY 2016 Plans:*** Complete implementation of RTS safety control system replacement.	0.600	0.200	-
Title: Legacy Servo Upgrade Program. ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:***	0.100	1.300	0.272

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017
Award contract to upgrade obsolete TRADEX antenna servos and drive motors. ***FY 2016 Plans:*** Continue development of TRADEX antenna upgrade and begin upgrade of additional radar or optics servo systems ***FY 2017 Plans:*** Complete TRADEX servo upgrade and continue upgrade of additional radar or optics servo systems.			
Title: Mission Data Network (MDN) Modernization. ***Description:*** MDN Modernization. ***FY 2015 Accomplishments:*** Continued new network architecture changes to improve on-atoll bandwidth to support increasing custom requirements. ***FY 2016 Plans:*** Complete new network architecture changes to improve on-atoll bandwidth to support increasing custom requirements.	0.350	0.084	-
Title: RTS Automation and Decision Support. ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Continued addition of automation measures and more sophisticated algorithms to improve operator efficiency. Focus on automation at the sensor level. ***FY 2016 Plans:*** To complete radar automation and begin work on displays and control center automation. ***FY 2017 Plans:*** Will continue work on displays and control center automation.	1.000	0.222	0.200
Title: TRADEX L-Band Modulator ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Continued replacement of TRADEX L-band tube-based modulator with a commercial solid-state unit.	0.703	-	-
Title: Net Centric Operations Upgrade ***Description:*** Funding is provided for the following effort	0.100	0.366	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
FY 2015 Accomplishments: Begin development of software to allow communication between the RTS Distributed Operations (RDO) software and Net Centric enterprises such as TENA. ***FY 2016 Plans:*** Complete development of software to allow communication between the RTS Distributed Operations (RDO) software and Net Centric enterprises such as TENA.			
Title: Transmitter Reliability Improvements ***Description:*** Funding is provided for the following effort. ***FY 2015 Accomplishments:*** Designed a solid state amplifier solution that has the equivalent average power of one ALTAIR UHF Traveling Wave Tube (TWT). This is a development effort with a goal of determining the cost, schedule, and risk to implement an all solid state transmitter replacement.	0.075	-	-
Title: Optics Focal Plane Technology Replacement Study ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Develop a digital-pixel focal plane array (DFPA) long-wave infrared camera and telescope to increase the sensitivity and dynamic range of RTS optics. ***FY 2016 Plans:*** Complete DFPA camera/telescope and integrate onto the Super RADOT-5 mount on Roi-Namur	0.200	0.175	-
Title: Legacy Radar Replacement Study ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Study multi-static radar system designs that could be used to replace the legacy radars at the Range.	0.100	-	-
Title: Self healing software and algorithms ***Description:*** Funding is provided for the following efforts ***FY 2015 Accomplishments:***	0.100	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017
Study automatic software algorithms and hardware healing approaches for the range sensor subsystems.			
Title: Range in a box - simulation over live study ***Description:*** Funding is provided for the following effort ***FY 2015 Accomplishments:*** Conducted studies into the improvement of the current deployed simulation system capability and how to provide the necessary interface layer allowing the testing of asset software, hardware models, and simulation.	0.100	-	-
Title: Multi-Statics for Radars and Telemetry - Prototype ***Description:*** Funding is provided for the following effort. ***FY 2017 Plans:*** This development will enable all the existing KREMS radars to be used as illuminators and the RTS telemetry systems to be used as receivers in a multi-static array that will increase the sensitivity of the systems, reduce the need for high power operation in the systems, and in conjunction with the software radio radar project and the solid state transmitter project will allow the radars to be operated at a lower O&M cost.	-	-	0.200
Title: Ground Based Discrimination Radar ***Description:*** Funding is provided for the following effort. ***FY 2016 Plans:*** Requirements definition and preliminary design for the Ground Based Radaer (GBR) upgrade. The GBR is being transferred from MDA to SMDC in FY16 ***FY 2017 Plans:*** Development, integration, and testing of the GBR upgrade	-	3.100	3.150
Accomplishments/Planned Programs Subtotals	5.687	7.529	7.032

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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*

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
984: *Major Developmental Testing Instrumentation*	-	46.139	52.093	31.741	-	31.741	39.948	41.898	44.552	45.394	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The following programs are New Starts for FY17: Robotics/UAS Instrumentation Suite and System of Systems Cooperative Engagement Test Infrastructure (SCETI).

In FY17 Range Radar Replacement Program (RRRP) was realigned within this Program Element from Project 984/Major Developmental Testing Instrumentation to Project EY9/RRRP. RRRP transferred to PEO M&S for completion of the mission.

A. Mission Description and Budget Item Justification

This project develops and acquires major test instrumentation to perform developmental testing of weapon systems at U. S. 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.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than $1.5 Million per year or $7.5 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.

Electromagnetic Environmental Effects (E3) Electromagnetic Radiation Effects (EMRE) Systems Modernization will upgrade equipment at the WSMR EMRE site where E3 testing is performed to evaluate survivability and vulnerability of military systems. Project will upgrade and replace signal transmitters, refurbish an anechoic test chamber, replace data acquisition equipment and install a new turntable to support test items. Nuclear Effects Test Capabilities Modernization acquires and upgrades Special Test Equipment for nuclear facilities located at White Sands Missile Range (WSMR). These acquisitions and upgrades include the Pulse Current Injection Simulator, Prompt Gamma Simulator, Gamma Range Facility, Linear Electron Accelerator (LINAC), Semi-Conductor Test Lab, Electromagnetic Pulse and the Solar Furnace. Common Range Integrated Instrumentation System (CRIIS) Objective Program provides precision location instrumentation which will significantly increase the T&E ranges' capability to meet the test instrumentation needs of the tri-service range users. Test Network Modernization 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 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. Telemetry Systems Modernization program will upgrade/replace mobile and fixed site telemetry equipment and telemetry data processing equipment thereby gaining spectrum efficiency at Redstone Test Center (RTC), Aberdeen Test Center (ATC), White Sands Missile Range (WSMR) and Yuma Proving Ground (YPG). Future Wireless Network program will procure and integrate wireless network technologies across ATEC test activities which will provide near real-time data collection support for Developmental Test and Operational Test events. Robotics/UAS Instrumentation Suite

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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*

to develop and procure instrumentation for testing controlled and autonomous ground and aerial robotic systems. System of Systems Cooperative Engagement Test Infrastructure (SCETI) 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Range Radar Replacement Program (RRRP). ***Description:*** EMD phase contract activities for the RRRP. ***FY 2015 Accomplishments:*** Continued Engineering Manufacturing Development (EMD) for the RRRP for the Long Range Radars (LRR) and the Medium Range Radars (MRR) systems in preparation for replacement of equipment at Aberdeen Test Center (ATC), Redstone Test Center (RTC), White Sands Test Center (WSTC) and Yuma Test Center (YTC). ***FY 2016 Plans:*** Given results of ongoing studies, Engineering Manufacturing Development (EMD) continues for the RRRP with adjustments for the Long Range Radars (LRR) and the Medium Range Radars (MRR)systems in preparation for replacement of equipment at Aberdeen Test Center (ATC), Redstone Test Center (RTC), White Sands Test Center (WSTC) and Yuma Test Center (YTC).	29.865	17.411	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Electromagnetic Environmental Effects (E3) Systems Modernization (EMRE) project. ***Description:*** EMD phase contract activities for the E3 Systems Modernization (EMRE) project. This effort will upgrade 27 instrumentation test facilities as White Sands Missile Range (WSMR). ***FY 2015 Accomplishments:*** Funded EMD for the E3 Systems Modernization (EMRE) T2 and T3 transmitter systems. Funded two instrumentation vans. ***FY 2016 Plans:*** Funds for EMD for the E3 Systems Modernization (EMRE) 14 Test Facility Characterization Studies and 9 Site Surveys, Upgrade of support equipment and integration of four transmitter facilities, one turntable replacement and upgrading support equipment of two instrumentation vans, EMI test facility, Data Acquisition Software, and Radiation Hazard Testing Facilities. ***FY 2017 Plans:*** Funds for EMD for the E3 Systems Modernization (EMRE) and acquire the Electromagnetic Interference (EMI) and Peak Pulse Power systems and Electronic Discharge Test Facilities.	5.317	17.740	5.300
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Nuclear Effects Test Capability Modernization.	1.976	10.176	9.986

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017
Description: EMD phase contract activity for the Nuclear Effects Test Capability Modernization. ***FY 2015 Accomplishments:*** Continued the Engineering and Manufacturing Development (EMD) phase contract activity for the Nuclear Effects Test Capability Modernization. Program upgraded Special Test Equipment for nuclear facilities located at White Sands Missile Range (WSMR). Funded acquisition of Semi-Conductor Testing Laboratory upgrade, Linear Accelerator Upgrade, and Pulsed Current Injection capability upgrade. ***FY 2016 Plans:*** Continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Nuclear Effects Test Capability Modernization. Program to upgrade Special Test Equipment for nuclear facilities located at White Sands Missile Range (WSMR). Funds acquisition and upgrades of Linear Accelerator, Pulsed Current Injection capability, Gamma Radiation Facility, Vertical Electromagnetic Pulse Facility, High-Altitude Electromagnetic Pulse Facility, Enhanced Low Dose Rate Sensitivity capability, Dosimetry Laboratory, and Solar Furnace. ***FY 2017 Plans:*** Will continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Nuclear Effects Test Capability Modernization. Funds acquisition and upgrades of Special Test Equipment for Prompt Gamma Simulator facility and Rapid Response Laboratory. Funding adjusted in FY17 to accommodate program acquisition lead time for competitive procurement of Prompt Gamma Simulator.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. ***Description:*** EMD phase contract activities of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. This is a replacement system for the Advanced Range Data System (ARDS). This system will meet the critical need for measuring the precision location of units under test within the Time-Space domain. It provides a significant increase to the Test & Evaluation ranges' capability to meet the test instrumentation needs of the tri-service range users. The improvements are the data link, TSPI accuracy, miniaturization, standard interfaces, and system encryption of high dynamic instrumentation tracking pods CRIIS instrumentation upgrades will be delivered to White Sands Missile Range (WSMR). ***FY 2015 Accomplishments:*** Continued EMD of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. Funds deployment and design of instrumentation transport network of ground sites at WSMR. ***FY 2016 Plans:***	3.918	1.366	3.785

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Continues EMD of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. Funds acquisition of CRIIS support equipment: Two Instrumentation Pods, and associated remote ground stations and support equipment. ***FY 2017 Plans:*** Will continue EMD of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. Funds acquisition of CRIIS support equipment: Ten Instrumentation Pods, and associated remote ground stations and support equipment.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity of the Test Network Modernization Program. ***Description:*** EMD phase contract activity for the Test Network Modernization. ***FY 2016 Plans:*** Starts the Engineering and Manufacturing Development (EMD) phase contract activity for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges. ***FY 2017 Plans:*** Will continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges.	-	0.500	3.032
Title: Engineering and Manufacturing Development (EMD) phase contract activity for Robotics/UAS Instrumentation Suite ***Description:*** Robotics/UAS Instrumentation Suite for testing controlled and autonomous ground and aerial robotic systems. ***FY 2017 Plans:*** Leveraging requirements analysis conducted by ATEC Test Centers, project will begin EMD Phase to develop and procure instrumentation for testing controlled and autonomous ground and aerial robotic systems.	-	-	3.030
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Applied Environments Modernization program. ***Description:*** EMD phase contract activity for the Applied Environments Modernization program ***FY 2016 Plans:*** Will start the Engineering and Manufacturing Development (EMD) phase contract activity for the Applied Environments Modernization program. This program will upgrade antiquated Environmental labs for climatic and dynamic testing with new	-	0.300	2.061

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights. ***FY 2017 Plans:*** Will continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Applied Environments Modernization program. This 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.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Telemetry Systems Modernization program ***Description:*** EMD phase contract activity for the Telemetry Systems Modernization program ***FY 2016 Plans:*** Start the Engineering and Manufacturing Development (EMD) phase contract activity for the Telemetry Systems Modernization program. This program will upgrade/replace mobile and fixed site telemetry equipment and telemetry data processing equipment Redstone Test Center (RTC), Aberdeen Test Center (ATC), White Sands Missile Range (WSMR) and Yuma Proving Ground (YPG) . ***FY 2017 Plans:*** Will continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Telemetry Systems Modernization program. This program will upgrade/replace mobile and fixed site telemetry equipment and telemetry data processing equipment Redstone Test Center (RTC), Aberdeen Test Center (ATC), White Sands Missile Range (WSMR) and Yuma Proving Ground (YPG).	-	0.300	2.000
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Future Wireless Network program. ***Description:*** EMD phase contract activity for the Future Wireless Network program. ***FY 2016 Plans:*** Start the Engineering and Manufacturing Development (EMD) phase contract activity for the Future Wireless Network program. This program will procure and integrate wireless network technologies across ATEC test activities which will provide near real-time data collection support for developmental test and operational test events. ***FY 2017 Plans:***	-	0.300	1.574

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Will continue the Engineering and Manufacturing Development (EMD) phase contract activity for the Future Wireless Network program. This program will procure and integrate wireless network technologies across ATEC test activities which will provide near real-time data collection support for developmental test and operational test events.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for System of Systems Cooperative Engagement Test Infrastructure (SCETI) ***Description:*** System of Systems Cooperative Engagement Test Infrastructure (SCETI) ***FY 2017 Plans:*** Leveraging requirements analysis conducted by ATEC Test Centers, project will begin the EMD phase of System of Systems Cooperative Engagement Test Infrastructure (SCETI) 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.	-	-	0.973
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Systems Test and Integration Laboratory (STIL). ***Description:*** Continue EMD phase contract activities for the Systems Test and Integration Laboratory (STIL). ***FY 2015 Accomplishments:*** Completed EMD for the Systems Test and Integration Laboratory (STIL) for use in developmental testing and integration engineering, including a virtual test environment to support integration testing of aviation electronic systems as a part of modernization of Army aircraft. Planned Full Operational Capability in 4 Qtr.	5.063	-	-
Accomplishments/Planned Programs Subtotals	46.139	48.093	31.741

	FY 2015	FY 2016
Congressional Add: Congressional Add for Cyber Vulnerabilities Research	-	4.000
FY 2016 Plans: Congressional Add for Cyber Vulnerabilities Research will provide comprehensive cyber data analytics and fusion instrumentation capabilities including response times, actions, levels of difficulty and visualization for both Red and Blue actors in live and high fidelity virtual environments during developmental and operational test, evaluation and assessments.		
Congressional Adds Subtotals	-	4.000

C. Other Program Funding Summary ($ in Millions)

N/A

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C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
986: *Major Operational Test Instrumentation*	-	2.455	6.958	17.971	-	17.971	18.993	15.634	15.828	16.060	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program funds the development, acquisition, and integration of major operational test instrumentation for the U.S. Army Test and Evaluation Command's (ATEC) 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.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than $1.5 Million per year or $7.5 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.

Director Operational Test and Evaluation (DOT&E) annual report to Congress identified shortfalls in the Army's abilities to create realistic operational environments. The Integrated Live-Virtual-Constructive (LVC) Test Environment project will address multiple shortfalls identified by DOT&E. ILTE will deliver a system of systems to provide ar Real-Time Casualty Assessment and instrumentation suite (RTCA) that delivers a high fidelity, realistic, real-time capability to measure hardware and personnel performance in modern combat environments. ILTE 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. ILTE also allows the U.S. Army to test all Current-to-Future, weapon systems in a realistic operational environment. ILTE 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 Systems (GPS), encryption components, and integrates 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 ILTE 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 into the Network Integration Evaluation (NIE), M1, M2, Stryker, and Armored Multi-Purpose Vehicle (AMPV), AH-64E, Gray Eagle and other operational tests.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Project name changed from Real-Time Casualty Assessment (RTCA) to Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE).	2.455	6.958	17.971

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017

Description: Transition from Technology Maturation and Risk Reduction (TMRR) Phase to EMD Phase and acquisition of ILTE capabilities required to conduct Operational Tests.

FY 2015 Accomplishments:
Funded the development of hardware, software, interfaces, and new capabilities to ensure RTCA requirements for upcoming operational tests are satisfied. Developed initial efforts directed toward RTCA. Funded RTCA instrumentation and simulation systems that were used to support Force-on-Force Operational Tests. Development efforts included: integration with new tactical systems under test, integration with Live, Virtual, and Constructive (LVC) simulation environments, RTCA capabilities for active protection systems and countermeasures, RTCA capabilities for communications/sensor kills and degradations, development, integration, and testing of mission command effects and degradations, communications upgrade, new communications sub-systems, new encryption and RTCA capabilities for electronic warfare and countermeasures.

FY 2016 Plans:
Funds the development of hardware, software, interfaces, and new capabilities to ensure RTCA and ILTE requirements for upcoming operational tests are satisfied. Develops efforts that will initially be directed toward RTCA. Funds will also be allocated for RTCA instrumentation and simulation systems to be used to support Force-on-Force Operational Tests. Development efforts include: integration with new tactical systems under test, integration with Live, Virtual, and Constructive (LVC) simulation environments, RTCA capabilities for active protection systems and countermeasures, RTCA capabilities for communications/sensor kills and degradations, development, integration, and testing of mission command effects and degradations, communications upgrade, new communications sub-systems, new encryption and RTCA capabilities for electronic warfare and countermeasures.

FY 2017 Plans:
ILTE project transitions from Technology Maturation and Risk Reduction (TMRR) to Engineering and Manufacturing Development (EMD) Phase. Project ramps up to provide capabilities in direct support of Operational Test of the Joint Light Tactical Vehicle and Armored Multi-Purpose Vehicle. Will continue to fund the development of hardware, software, interfaces, and new capabilities to ensure RTCA/ILTE requirements for upcoming operational tests are satisfied. Will fund integration of improved representation of unmanned aerial system in operational test environments. Will continue to develop capability to provide a realistic operational test environment. Funds will continue to be allocated for RTCA instrumentation and simulation systems to be used to support Force-on-Force Operational Tests which support a more comprehensive operational test. New development efforts will include integration of classified and unclassified simulations into a common environment. Continued development efforts include, integration with new tactical systems under test, integration with Live, Virtual, and Constructive simulation environments, RTCA capabilities for active protection systems and countermeasures, RTCA capabilities for communications/sensor kills and

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017
degradations, development, integration, and testing of mission command effects and degradations, communications upgrade, new communications sub-systems, new encryption and RTCA capabilities for electronic warfare and countermeasures.			
Accomplishments/Planned Programs Subtotals	2.455	6.958	17.971

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
EY9: *Range Radar Replacement Program (RRRP)*	-	0.000	0.000	26.333	-	26.333	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY17 Range Radar Replacement Program (RRRP)was realigned within this Program Element from Project 984/Major Developmental Testing Instrumentation to Project EY9/RRRP.

A. Mission Description and Budget Item Justification

The Range Radar Replacement Program (RRRP) develops modern instrumentation radars to replace obsolete tracking and surveillance radars at U.S. Army Test and Evaluation Command's (ATEC) Developmental Test Command (DTC) activities which include: Aberdeen Test Center (ATC), MD; Redstone Test Center (RTC), AL; White Sands Test Center (WSTC), NM; and Yuma Test Center (YTC), AZ. The acquisition of modern instrumentation radar systems will provide the Army critical testing data essential for the development of complex next generation technology and advanced system capabilities. RRRP provides the test centers with improved radar resolution, sensitivity, accuracy, clutter suppression, and reliability. The anticipated solution for the program requirements is a modular open architecture system consisting of four primary items: a long range radar (LRR), a medium range radar (MRR), a short range radar (SRR), and a radar operations console (ROC). The resulting system will not only reduce operation and sustainment costs for the ranges, but improve data collection, thus enhancing development of Army systems being tested at these ranges. The current fleet of instrumentation radars located at ATC, RTC, WSTC, and YTC has become antiquated to the extent that they are not able to support the test needs of the test centers.

FY 17 Base RDT&E dollars in the amount of $26.333 million funds the development, software engineering, and testing of replacement radars.

Prior development effort was funded in APE 664759 984. RRRP is currently being re-baselined. As a result, associated procurement dollars will be reprogrammed and redistributed as RDT&E through FY21.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Engineering and Manufacturing Development (EMD) Phase Contract Activity	-	-	26.333
Description: EMD phase contracts activities for RRRP			
FY 2017 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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 2015	FY 2016	FY 2017
Continued Engineering and Manufacturing Development (EMD) for the RRRP for the Long-Range Radars (LRR) and the Medium Range Radars (MRR) systems in preparation for replacement of equipment at Aberdeen Test Center (ATC), Redstone Test Center (RTC), White Sands Test Center (WSTC) and Yuma Test Center (YTC).			
Accomplishments/Planned Programs Subtotals	-	-	26.333

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army			Date: February 2016
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / *Major T&E Investment*	Project (Number/Name) FA4 / *Warrior Injury Assessment Manikin (WIAMan)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
FA4: *Warrior Injury Assessment Manikin (WIAMan)*	-	0.000	0.000	1.700	-	1.700	5.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start for FY17: Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD). FA4 is a new Project in Army Program Element 0604759A, created for WIAMan.

A. Mission Description and Budget Item Justification

Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) plans to develop and produce Warrior-representative ATDs that incorporate associated biomedically-validated injury assessment tools to better characterize dynamic events and injury risks measured in Live Fire Test & Evaluation (LFT&E) and vehicle development efforts. This capability is comprised of an anthropomorphic test device (ATD) system purpose built for the Title 10 live fire test and evaluation environment and associated biomechanics data and analysis tools.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD)	-	-	1.700
Description: Will begin the transition from Technology Maturation and Risk Reduction (TMRR) phase for Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) ***FY 2017 Plans:*** Will begin the transition from Technology Maturation and Risk Reduction (TMRR) phase with Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) prototype refinement to source selection activities preparing for entry into EMD phase.			
Accomplishments/Planned Programs Subtotals	-	-	1.700

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 6	**R-1 Program Element (Number/Name)** PE 0604759A / *Major T&E Investment*	**Project (Number/Name)** FA4 / *Warrior Injury Assessment Manikin (WIAMan)*

E. Performance Metrics

N/A