ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE
6 - Management support	**0604759A - Major T&E Investment**

	COST (In Thousands)	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
	Total Program Element (PE) Cost	65999	66030	64953	67547	65584	67244	45263
983	Reagan Test Site (RTS) T&E Investments	8131	7204	8297	8509	8578	8919	0
984	Major Developmental Testing Instrumentation	40839	39903	36484	37834	35991	36707	27833
986	Major Operational Test Instrumentation	17029	18923	20172	21204	21015	21618	17430

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) Developmental Test Command (DTC) test activities: White Sands Missile Range (WSMR), NM; Yuma Proving Ground, (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; Electronic Proving Ground (EPG), AZ; Redstone Technical Test Center (RTTC), AL; Aviation Technical Test Center (ATTC), AL; and for the Reagan Test Site (RTS) at the US 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE
6 - Management support	**0604759A - Major T&E Investment**

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006)	58988	64498	64480
Current BES/President's Budget (FY 2007)	65999	66030	64953
Total Adjustments	7011	1532	473
Congressional Program Reductions		-302	
Congressional Rescissions		-666	
Congressional Increases		2500	
Reprogrammings	7011		
SBIR/STTR Transfer			
Adjustments to Budget Years			473

Change Summary Explanation: FY 2005: Funds reprogrammed to fund Digital Network Migration, Crew Station Interface, Fiber Optic Network II, Systems Test and Intergration Laboratory, Quantitative Visualization, Mobile Multi-Sensor Time Space Position Information (TSPI) System, and Operational Test-Tactical Engagement System. FY 2006: Congressional Plus Up ($2,500). $1,000 for Vehicle Durability Simulator and $1,500 for Network Centric Warfare-Digital Battlefield Instrumentation (NCW-DBI).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0604759A - Major T&E Investment**	**983**

COST (In Thousands)	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
983 Reagan Test Site (RTS) T&E Investments	8131	7204	8297	8509	8578	8919	0

A. Mission Description and Budget Item Justification: This project funds the purchase of major improvement and modernization (I&M) equipment for the Ronald Reagan Ballistic Missile Defense Test Site (RTS) located on US Army Kwajalein Atoll (USAKA) in the Marshall Islands. RTS is a national test site supporting Army, Missile Defense Agency (MDA), US Air Force, National Aeronautics and Space Administration (NASA), U.S. Strategic Command (STRATCOM), and other customers. Program upgrades radars, telemetry, optics, range safety, communications, command/control and other equipment required to maintain RTS as a national test range. These upgrades are critical to maintain a state of the art sensor suite and to the success of MDA test missions, Minuteman Operational Tests and STRATCOM's Space Surveillance Network (SSN) and Space Object Identification (SOI) operations.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
Upgrade RTS Safety Control Center (RSCC).	270	0	0
Modernize RTS Operations Control Center (ROCC) for compatibility with upgraded RTS sensors and modernize the existing 10 year old Kwajalein Mission Control Center computer hardware and software. Improves initial interoperability with other Pacific Ranges.	4700	3900	0
Modernize MPS-36 radars to replace unsupportable hardware and computer systems.	1700	600	0
Operations Coordination Center (Follow-on phase of the ROCC project). Procure necessary commercial off-the-shelf (COTS) hardware and software for interoperability with Test and Training Enabling Architecture (TENA)middleware. Enable interoperability among all Test and Evaluation ranges in the Pacific region. Prepares for distributed operations in CONUS.	0	1244	3008
Millimeter Wave (MMW) Performance Enhancement. Replace current Ka band transmitter with new gyro traveling wave tube (TWT) based design. Enables tracking and imaging of smaller satellites and collection of intercept data at greater ranges.	500	500	1000
Film to Digital Video (FDV). Replacement of 70mm cameras with high resolution, high speed digital video cameras and recorders.	961	900	0
Range Safety System Upgrade (RSSU). Modernize fixed and mobile range safety assets using commercial off-the-shelf hardware and common computer architecture and interface.	0	60	500
Central Operations of Telemetry Assets (COTA). Relay the analog RF telemetry signals from remote TM tracking antennas to the Kwajalein Telemetry Center.	0	0	900
Digital and Remoted Optical Sensors (DROpS). Replaces 35mm film camera. Digital image capture system and common control room.	0	0	2889
Total	8131	7204	8297

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0604759A - Major T&E Investment**	**984**

COST (In Thousands)		FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
984	Major Developmental Testing Instrumentation	40839	39903	36484	37834	35991	36707	27833

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) Developmental Test Command (DTC) activities which include: Yuma Proving Ground (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; Electronic Proving Ground (EPG), AZ; White Sands Missile Range (WSMR), NM; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL. Projects are designated as a major program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (generally greater than $1 Million/yr or $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. Vehicle Durability Simulator (VDS) is a laboratory-based durability simulation which simulates driving on and off-road condition for both wheeled and track vehicles. The Versatile Information Systems Integrated Online (VISION) develops a modular, scaleable instrumentation suite with sufficient integral mass storage for extended operation. It extends ATC and Department of Defense (DoD) networking to mobile platforms nationwide and provides database accessibility throughout DoD. It also provides advanced program management tools, and on-line customer definable multimedia reports. The Advanced Multi-Spectral Sensor and Subsystem Test Capabilities (AMSSTC) develops the capability to test modern weapon systems and subsystems in the laboratory, in an open or closed loop scenario. The Range Digital Transmission System (RDTS) will improve test operations through modernization and will reduce test costs allowing for efficient data collection and remote operations at YPG. The Mobile Infrared Scene Projector (MIRSP) project will conduct performance testing of imaging Infrared and Forward Looking Infrared (FLIR) sensors while installed on the weapon system under test at RTTC. 21st Century Target Control System provides the integration of newly developed joint target control system with the range communication infrastructure and command center and ensures target control interoperability between the services. Starship II is the Command, Control, Communications, Computers and Intelligence (C4I) Test Instrumentation Control Center (TCC) which enhances and modernizes EPG's Enhanced Position Location and Reporting System (EPLRS) TCC to provide and automate a command and control center software tool that monitors test progress and performance status in real time for all Army Battle Command Systems (ABCS). Joint Warfighter Test and Training Suite is the development of an instrumented test area capable of creating Military Operations in Urban Terrain (MOUT) and maneuver training area for platoon size operations. Digital Network Migration is the development of mobile assets for support of remote testing areas and linking instrumentation assets to Test Support Network and Cox Range Control Center (CRCC). Crew Station Interface is the development of a reconfigurable cockpit simulator for various rotary wing platforms to determine optimum man-machine interfaces and connectivity via Defense Research Engineering Network (DREN) to other service/DoD test sites. Fiber Optic Network II is the installation of digital fiber optic cable and transmission electronics to modernize, secure and expand the backbone telecommunication and data transmission network in support of Aberdeen Test Center. Systems Test and Integration Laboratory (STIL) is the development of a systems integration and test lab 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. Quantitative Visualization (QV) for Test and Evaluation is the development of QV integration models to enable rapid conversion of test data into visual representations. Mobile Multi-sensor Time-Space Position Information (TSPI) System (MMTS) is the development of a tracking system for weapons with low/flat trajectories and low radar cross sections. Roadway Simulator (RWS) allows for year round, 24/7 testing and provides the ability to safely conduct repeated conditions testing and evaluation of vehicle systems in real word driving environment that otherwise cannot be performed due to driver and test area safety limitations.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
Vehicle Durability Simulator (VDS): Development of a Laboratory-based durability simulation which simulated driving on and off-road	2500	1000	0

condition for both wheeled and track vehicles. This system allows for year round, 24/7 testing capabilities, provided the ability to perform accelerated life cycle testing of real world driving conditions, safely imposed extreme conditions for both durability and drivetrain performance to reduce overall testing time requirements.			
Range Data Transmission System (RDTS): Install digital fiber optic cable and transmission electronics to modernize, secure and expand the backbone telecommunication and data transmission network in support of the East Kofa, North and South Cibola test ranges at Yuma Proving Ground.	7894	4672	0
Advanced Multi-Spectral Sensor and Subsystem Test Capabilities (AMSSTC): Continue design, development and integration of advanced multi-spectral simulation, test and acceptance resource for both performance and production testing of Common Missile and other potential multi-mode guided missiles.	9354	10890	6252
Versatile Information Systems Integrated Online (VISION): Continue development/enhancement of the Digital Library to increase database and links to other Army facilities. Continue development of new smart sensors to monitor vehicle position and initial research to develop communications protocol. Develop security communication features to handle classified information.	9731	9572	9176
Mobile Infrared Scene Projector (MIRSP): Continue development and integration of the Multi-spectral Subsystem. Participate in the design, development and integration of the large format resistive-emitter array (LFRA) IRSP to perform integration of the LFRA into Objective MIRSP.	859	170	3241
21st Century Target Control System: Develop and integrate DoD-standard multi-service target control system at WSMR.	980	730	0
Starship II: Develop enhancements and expansion of the functions for the C4I/Test Instrumentation Control Center (TCC) to test the Digitized Army and it's suite of Army Technical Architecture (ATA) - Compliant C4I systems.	1573	1706	1672
Joint Warfighter Test and Training Suite (JWTT): Develop instrumented test area capable of creating mobile operations and maneuver training area for platoon size operations.	918	1339	2100
Digital Network Migration (DNM): Develop mobile assets for support of testing in remote areas and linking of instrumentation assets to the Test Support Network and Cox Range Control Center (CRCC)	1793	3438	5459
Crew Station Interface (formerly Reconfigurable Cockpit Simulator (RCS)): Develop a reconfigurable cockpit simulator for various rotary wing platforms to determine optimum man-machine interfaces and connectivity via Defense Research Engineering Network (DREN) to other service/DoD test sites	656	875	1245
Fiber Optic Network II (FON II) - Aberdeen Test Center (ATC): Install digital fiber optic cable and transmission electronics to modernize, secure and expand the backbone telecommunication and data transmission network in support of Aberdeen Test Center	1074	2216	2800
Systems Test and Integration Laboratory (STIL): Develops a systems integration and test lab 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.	432	1350	2077
Quantitative Visualization (QV) for Test and Evaluation: Develop QV integration models to enable rapid conversion of test data into visual representations.	760	900	858
Mobile Multi-sensor Time Space Position Information (TSPI) System (MMTS)(formerly Hypervelocity Advanced TSPI System): Begin development of a tracking system for weapons with low/flat trajectories and low radar cross sections.	919	1045	1604
Roadway Simulator (RWS): Completed Phase 3 tractor-trailer laboratory-based vehicle performance testing capability. Allows for year round, 24/7 testing and provides the ability to safely conduct repeated conditions testing and evaluation of vehicle systems in real world	1396	0	0

driving environment that otherwise cannot be performed due to driver and test area safety limitations. Augmented previously delivered capability currently in use for rapid testing and fielding of up-armored High Mobility Multipurpose Wheeled Vehicles (HMMWV).			
Total	40839	39903	36484

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2006

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0604759A - Major T&E Investment**	**986**

COST (In Thousands)		FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
986	Major Operational Test Instrumentation	17029	18923	20172	21204	21015	21618	17430

A. Mission Description and Budget Item Justification: This project supports the development of major field instrumentation for Operational Testing (OT), Force Development Testing and Experimentation (FDTE), Army Warfighting Experiments (AWE) for the U.S. Army Test and Evaluation Command (ATEC), and Army Transformation. Each initiative set forth in this program element is directly tied to tactical systems that support the following Army Modernization Plan operational capability areas: Dominate Maneuver, Full Dimensional Protection, Precision Engagement, and Focused Logistics. The cornerstone of this effort is the Operational Test-Tactical Engagement System (OT-TES) vice Objective Real-Time Casualty Assessment and Instrumentation Suite (Objective RTCA) that provides users a high fidelity, realistic, real-time capability to measure the performance of hardware and personnel under tactical conditions for small and large-scale operations (up to 1,830 players). OT-TES allows the U.S. Army to test all Current-to-Future, Future Force, and Future Combat Systems (FCS) capabilities in a force-on-force operational environment. OT-TES Research, Development, Test and Evaluation (RDTE) develops performance enhancements and technology upgrades to the Command, Control and Communications (C3) Center, Communications Network, weapons system interfaces, miniaturization of the vest peripherals, Global Positioning System (GPS), encryption components and integrates high-fidelity digital battlefield data collection and analysis tools. These tools will collect, store and analyze data from the digital battlefield. These improvements will enable OT-TES to measure and record accrued damage, levels of exposure, effects of countermeasures, evasive action, and instrument threat vehicles, while significantly reducing system intrusiveness and increase the safety of current instrumentation for both vehicle and dismounted instrumentation. Instrumentation does not presently exist to monitor, record, stress, and analyze the effects of the digital battlefield in realistic operational scenarios. This capability is required by the operational test community to integrate digital battlefield data collection and analysis tools into the Mobile Automated Instrumentation Suite (MAIS) as enhancements to the fielded MAIS system. These tools will collect, store and analyze data from this new dimension of digital battlefield warfare. The ability to fully stress the entire battlefield with numerous simulated entities presents opportunities for significant cost savings and greater realism than would otherwise be achievable. This effort responds to the current Operations Tempo (OPTEMPO) and Personnel Tempo (PERSTEMPO) demands to force the U.S. Army to conduct more realistic, more accurate, and comprehensive evaluations at reduced costs by virtually replicating a greater number of troop resources in force-on-force testing and training exercises. Personnel and resource cuts have already been taken in the test community predicated upon data reduction/analysis streamlining provided by this capability.

Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS) Enterprise Integration Soluion (EIS) is the operational test environment for FCS and the Future Force. OASIS EIS provides the integrated environment required for testing of network centric systems in a realistic operational environment.

Accomplishments/Planned Program	FY 2005	FY 2006	FY 2007
OT-TES: Develop improved communications architecture, rotary-wing instrumentation, new encryption capabilities, and geometric pairing technologies. Complete development of weapons performance modules, player unit upgrades, and Air Defense Artillery fly-out models	14803	16210	18836
Develop Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS)Enterprise Integration Solution (EIS).	1226	1213	1336
Network Centric Warfare Digital Battlefield: Develop the next generation test and training integrated technologies required to support the future mission of the evolving battle space.	1000	1500	0
Total	17029	18923	20172