ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY
6 - Management support

PE NUMBER AND TITLE
0604759A - Major T&E Investment

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
Total Program Element (PE) Cost		47054	60141	57987	56309	57814	60435	63513
983	MAJOR T&E INVEST-USAKA	8083	13749	8493	6210	7098	7431	7811
984	MAJOR TECH TEST INSTR	32431	35673	35361	34607	32694	34153	35883
986	MAJ USER TEST INST	6540	10719	14133	15492	18022	18851	19819

A. Mission Description and Budget Item Justification: This program funds 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 US Army Kwajalein Atoll (USAKA), which is managed by the Space and Missile Defense Command. Program also funds development and acquisition of Operational Test Command (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.

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	51168	62135	66524
Current Budget (FY 2005 PB)	47054	60141	57987
Total Adjustments	-4114	-1994	-8537
Congressional program reductions		-528	
Congressional rescissions			
Congressional increases			
Reprogrammings	-4114	-1466	
SBIR/STTR Transfer			
Adjustments to Budget Years			-8537

Change Summary Explanation: Funding - FY 2005: Funds realigned (-$8537) to support higher priority requirements.

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6 - Management support	**0604759A - Major T&E Investment**	**983**

COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
983 MAJOR T&E INVEST-USAKA	8083	13749	8493	6210	7098	7431	7811

A. Mission Description and Budget Item Justification: This project funds the purchase of major improvement and modernization (I&M) equipment for the US Army Kwajalein Atoll/Ronald Reagan Ballistic Missile Defense Test Site (USAKA/RTS) located in the Marshall Islands. USAKA/RTS is a national test range supporting Army, Missile Defense Agency (MDA), US Air Force, National Aeronautics and Space Administration (NASA), STRATCOM, and other customers. Program upgrades radars, telemetry, optics, command/control and other equipment required to maintain RTS as a national test range. These upgrades are critical to the success of Theater Missile Defense (TMD) and Ground-based Mid-course Missile Defense (GMD) test missions. The completed Kwajalein Modernization and Remoting (KMAR) project was a concurrent, range-wide modernization effort maximizing the use of common, standardized commercial off-the-shelf (COTS) technology to replace obsolete components; implement common hardware/software architectures and automation; and "remote" the operation of range sensors and instrumentation to the island of Kwajalein. This effort upgraded range capabilities that are critical to the success of Theater Missile Defense (TMD) and Ground-based Mid-course Missile Defense (GMD) test missions. This activity supports the Current to Future transition path of the Transformation Campaign Plan.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Completed Kwajalein Modernization and Remoting (KMAR) - Completed installation of Intermediate Frequency (IF) receiver, computer, digital pulse compression and recording equipment for Advanced Research Projects Agency (ARPA) Long Range Tracking and Instrumentation Radar (ALTAIR). Completed development of Target Resolution and Discrimination Experiment (TRADEX) KMAR systems. Completed installation of four telemetry (TM) antenna systems at Kwajalein TM site. Completed installation of remaining four Super Recording Automatic Digital Optical Tracker (RADOT) servo systems. Completed installation of IF receiver, computer, digital pulse compression and recording equipment for TRADEX Radar	3416	0	0
Upgrade RTS Safety Center to incorporate alternate command destruct transmitter.	890	1500	0
Completed Outside Cable Plant Restoration - All pressurized, lead-sheathed backbone and distribution cable was replaced with copper cable. This upgrade will provide adequate mission and administrative communications support for RTS technical instrumentation and its supporting/supported organizations and customers.	2610	0	0
Modernize RTS Operations Control Center (ROCC) for compatibility with upgraded KMAR sensors and to provide interoperability with Pacific Ranges.	1167	5235	3002

Accomplishments/Planned Program (continued)	FY 2003	FY 2004	FY 2005
Provide Transportable Optics via Transportable Infrared Optical Sensors (TIROS) capabilities which will enable RTS to project optical support data throughout the Marshall Islands and to Wake, Johnston, Midway or Alaska in support of missions.	0	0	2991
Apply new Solid State Technology to simplify radar transmitter hardware. Enhances reliability, sensitivity and commonality of KREMS radar transmitters.	0	1500	1200
Modernize MPS-36 Radars to replace unsupportable hardware and computer systems.	0	3100	500
Initiate Film to Digital Video (FDV) replacement of 70/35mm cameras with high resolution, high speed digital video cameras and recorders.	0	1200	800
Complete ALTAIR wheels and rails upgrade.	0	805	0
Small Business Innovative Research/Small Business Technology Transfer Programs.	0	409	0
Totals	8083	13749	8493

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6 - Management support	**0604759A - Major T&E Investment**	**984**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
984	MAJOR TECH TEST INSTR	32431	35673	35361	34607	32694	34153	35883

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 $1M/yr or $5M 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. The Test Support Network (TSN) at WSMR provides complete secure coverage of voice, data and video in a single integrated, transport system. The TSN will provide advanced encryption capabilities and remote control of switching capabilities for test configuration and total network data management control. The Land Combat Instrumentation (LCI) provides for upgrade and expansion for Automotive Communication Network (ACN) suite of instrumentation required for performance testing of combat and tactical vehicles, advanced armor, and advanced munitions. The Hardened Subminiature Telemetry and Sensor System (HSTSS) is developing, miniaturizing, and hardening an instrumentation/telemetry package at YPG that will provide continuous direct measurement of internal functioning and flight data for cannon-launched munitions, smart submunitions, and small missiles/rockets. The Versatile Information Systems Integrated Online (VISION) develops a modular, scaleable instrumentation suite with sufficient integral mass storage for extended operation; extends ATC and DoD networking to mobile platforms nationwide; and provides database accessibility throughout DoD, 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 ATTC and 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 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: FY05 development instrumented test area capable of creating MOUT and maneuver training area for platoon size operations. Digital Network Migration: FY05 development of mobile assets for support of testing remote areas and linking instrumentation assets to TSN and Cox Range Control Center (CRCC). This program line supports the Current to Future transition path of the Transformation Campaign Plan (TCP).

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February 2004

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

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Completed Land Combat Instrumentation (LCI): Installation of Automotive Communication Network (ACN) at test areas of Aberdeen Test Center.	318	0	0
Test Support Network (TSN): Completed installation of transmission electronics and system integration and testing efforts at White Sands Missile Range.	1369	0	0
Range Data Transmission System (RDTS): FY03-05 installation of 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.	12295	7960	8353
Hardened Subminiature Telemetry and Sensor System (HSTSS): FY03-04 initiate and complete development of HSTSS Embedded Instrumentation for single round munitions which provides hardened internal data collection for diagnostics and description of flight dynamics for speed, location, yaw, pitch, and roll while surviving 100,000 (+) “G” forces.	4674	600	0
Advanced Multi-Spectral Sensor and Subsystem Test Capabilities (AMSSTC): FY03-05 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.	5153	13287	13992
Versatile Information Systems Integrated Online (VISION): FY03-05 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. Development of security communication features to handle classified information.	6313	6691	10297
Mobile Infrared Scene Projector (MIRSP): FY03-04 develop multi-spectral projection capability and participate in design of large format resistive array. FY05 begin development of 2048x1024 pixel large format, resistive array infrared scene projector.	1412	2005	2719
21st Century Target Control System: FY03-04 development and integration of DoD-standard multi-service target control system at WSMR.	200	2316	0
Starship II: Fy03-05 development of the 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.	697	1565	0
Dynamic Infrared Scene Projector (DIRSP): FY04 complete corrective actions and integrated system for final acceptance testing.	0	250	0
Small Business Innovative Research/Small Business Technology Transfer Programs	0	999	0
Totals	32431	35673	35361

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

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
986	MAJ USER TEST INST	6540	10719	14133	15492	18022	18851	19819

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), Army Transformation, Homeland Defense, and Anti-Terrorism. 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. Without these capabilities, the Operational Test community will encounter shortcomings in its ability to adequately assess the Future Combat System and Future Force developments. OT-TES 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). 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 present 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 resources cuts have already been taken in the test community predicated upon data reduction/analysis streamlining provided by this capability.

FY05 OT-TES RDTE provides for the development of an improved player unit communications and encryption system, player unit retrofits, Threat Air Defense Artillery (ADA) models to support the Comanche Operational Test (OT), friendly ADA air-to-ground advanced simulation endgame models (ASEM) to support ADA interface into testing, and the initial operational test Future Combat Systems (FCS)embedded technologies.

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

These systems support Current-to-Future transition path of the Transformation Campaign Plan (TCP).

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Development and upgrades to the OT-TES: FY03-05 complete fielding of new C3 Center and Weapons Performance Modules; development of rotary wing, Land Warrior, indirect fire, and Military Operations in Urban Terrain (MOUT) instrumentation; development of Air Defense Artillery (ADA) fly-out models; development of improved communication architecture; Geometric Pairing research and development.	6540	9149	12907
FY04-05 development of Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS).	0	1274	1226
Small Business Innovative Research/Small Business Technology Transfer Programs	0	296	0
Totals	6540	10719	14133