ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

February 2003

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

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
Total Program Element (PE) Cost		47304	51168	62135	66524	69490	65077	66625	68170
983	MAJOR T&E INVEST-USAKA	7503	8087	14205	9791	7321	8030	8226	8415
984	MAJOR TECH TEST INSTR	32437	35537	36856	40526	40561	36747	37605	38471
986	MAJ USER TEST INST	7364	7544	11074	16207	21608	20300	20794	21284

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; 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 Missile Defense Agency. 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

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B. Program Change Summary	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2003)	49482	53797	63845	68720
Current Budget (FY 2004/2005 PB)	47304	51168	62135	66524
Total Adjustments	-2178	-2629	-1710	-2196
Congressional program reductions				
Congressional rescissions		-947		
Congressional increases				
Reprogrammings	-876	-293		
SBIR/STTR Transfer	-1302	-1389		
Adjustments to Budget Years			-1710	-2196

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

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
983	MAJOR T&E INVEST-USAKA	7503	8087	14205	9791	7321	8030	8226	8415

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), 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 Kwajalein Modernization and Remoting (KMAR) project which is a concurrent, range-wide modernization effort to maximize 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 will upgrade range capabilities that are critical to the success of Theater Missile Defense (TMD) and Ground-based Mid-course Missile Defense (GMD) test missions as well as significantly reduce USAKA/RTS annual operating costs beginning in FY 2003. This activity supports the Legacy to Objective transition path of the Transformation Campaign Plan.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Continue Kwajalein Modernization and Remoting (KMAR) - Complete installation of Intermediate Frequency (IF) receiver, computer, digital pulse compression and recording equipment for ARPA Long Range Tracking and Instrumentation Radar (ALTAIR). After validation and verification, ALTAIR radar modernization was completed May 2002. Complete development of Target Resolution and Discrimination Experiment (TRADEX) KMAR systems. Complete installation of four telemetry (TM) antenna systems at Kwajalein TM site. Complete installation of remaining four Super Recording Automatic Digital Optical Tracker (RADOT) servo systems. Complete installation of IF receiver, computer, digital pulse compression and recording equipment for TRADEX Radar. After validation and verification, TRADEX radar modernization will be complete by February 2003.	7503	3416	0	0
Upgrade RTS Safety Center to prepare for Multiple Simultaneous Engagements (MSE).	0	890	0	0
Outside Cable Plant Restoration - All pressurized, lead-sheathed backbone and distribution cable will be 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.	0	2610	0	0

Accomplishments/Planned Program (continued)	FY 2002	FY 2003	FY 2004	FY 2005
Modernize RTS Mission Control Center for compatibility with upgraded KMAR sensors & to provide interoperability with Pacific Ranges.	0	1171	5500	4280
Provide Transportable Telemetry and Transportable Optics capability which enables RTS to project telemetry/optical support data throughout the Marshall Islands and to Wake, Johnston, Midway or Alaska in support of missions.	0	0	5200	4500
Apply new Solid State Technology to simplify radar transmitter hardware. Enhances reliability and commonality of KREMS radar transmitters.	0	0	1000	760
Procure Submarine Fiber Optics Transmission System (SFOTS) for an upgrade to classified and unclassified voice, video, and data networks. System will provide virtually error free voice, video, and data transmissions.	0	0	0	251
Modernize MPS-36 Radars to replace unsupportable hardware and computer systems.	0	0	2505	0
Totals	7503	8087	14205	9791

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

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
984	MAJOR TECH TEST INSTR	32437	35537	36856	40526	40561	36747	37605	38471

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; 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 Dynamic Infrared Scene Projector (DIRSP) conducts performance testing of night vision sensors and infrared (IR) imaging seekers at RTTC, and will provide the capability to fully simulate and synthesize present and future battlefields with a mix of real and simulated objects. 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 (AMMSTC) 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 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. 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. C4I Test Instrumentation Control Center (TCC) II enhances and modernizes Electronic Proving Ground'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). This program line supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Dynamic Infrared Scene Projector (DIRSP): Completed corrective actions and integrated system for final acceptance testing.	591	0	0	0
Land Combat Instrumentation (LCI): Installation of Automotive Communication Network (ACN) at test areas of Aberdeen Test Center.	736	318	0	0
Test Support Network (TSN): Installation of transmission electronics and system integration and testing efforts at White Sands Missile Range.	12578	1369	0	0
Range Data Transmission System (RDTS): Installation of digital fiber optic cable and transmission electronics in support of the East Kofa and South Cibola test ranges at Yuma Proving Ground.	10874	13078	9656	8353
Hardened Subminiature Telemetry and Sensor System (HSTSS): FY 2002 - Completed component deliveries and continued prototype system testing. FY 2003 - Initiate development of HSTSS embedded instrumentation for a single round for use in both testing and training arenas.	4252	5274	0	0
Advanced Multi-Spectral Sensor and Subsystem Test Capabilities (AMMSTC): FY 2002 Completed design of facility for multi-spectral hardware-in-the-loop test capability and began trade studies on various designs/materiels to be used. FY 2003-2005 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.	1004	5153	13287	15581
Versatile Information Systems Integrated Online (VISION): FY 2002 Continued on-going development/enhancement of the Digital Library. Began development of smart sensor to monitor vehicle position and initial research to develop communications protocol. FY 2003-2005 Continue development/enhancement of the Digital Library to increase database and links to other Army facilities. Continue development of new smart sensors. Development of security communication features to handle classified information.	1247	6313	6997	10297
Mobile Infrared Scene Projector (MIRSP): FY 2002 Completed integration of mobile capability for the DEGA and continue prototyping efforts for the Mobile Extended Spectrum Electro-Optical Test Set. FY 2003-2004 Develop multi-spectral projection capability and participate in design of large format resistive array. FY 2005 Begin development of 2048x1024 pixel large format, resistive array infrared scene projector.	1155	1412	2097	2719
21st Century Target Control System: Acquisition and integration of DoD-standard multi-service target control system at White Sands Missile Range.	0	1923	2321	1033
C4I/Test Instrumentation Control Center (TCC) II: Enhancement and expansion of the functions of the TCC to test the Digitized Army and its suite of Army Technical Architecture (ATA)-compliant C4I systems.	0	697	1637	1665
Quantitative Visualization for Test and Evaluation: Development of a new capability for real-time and quantitatively precise visualization of all test data, simulated and real, for use by testers and program managers.	0	0	861	878

Accomplishments/Planned Program (continued)	FY 2002	FY 2003	FY 2004	FY 2005
Totals	32437	35537	36856	40526

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

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
986	MAJ USER TEST INST	7364	7544	11074	16207	21608	20300	20794	21284

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. Cornerstone of this effort is the 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). Objective RTCA allows the US Army to test all Legacy-to-Objective, Objective 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 Interim Brigade Combat Team and Army Transformation developments. Objective RTCA 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 Objective RTCA 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 OPTEMPO and PERSTEMPO demands to force the US 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. Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS) is the operational test environment for the Future Combat systems of systems. OASIS provides the integrated environment required for testing of network centric systems in a realistic operational environment. These systems support Legacy-to-Objective transition path of the Transformation Campaign Plan (TCP).

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Development and upgrades to the Objective Real-Time Casualty Assessment Instrumentation Suite: 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; Air Defense Artillery (ADA) fly-out models; development of improved communication architecture; Geometric Pairing research and development; and Common Test and Training System research and development.	7364	7544	9703	14841
Development of Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS)	0	0	1371	1366
Totals	7364	7544	11074	16207