ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2005

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

COST (In Thousands)		FY 2□□4 Actual	FY 2□□5 Estimate	FY 2□□6 Estimate	FY 2□□7 Estimate	FY 2□□8 Estimate	FY 2□□9 Estimate	FY 2□1□ Estimate	FY 2□11 Estimate
	Total Program Element (PE) Cost	5994□	58988	64498	6448□	67151	67263	69271	48237
983	REAGAN TEST SITE □RTS) T&E INVESTMENTS	13697	8135	7321	8189	8398	8463	8800	0
984	MAJOR DEVELOPMENTAL TESTING INSTRUMENTATION	35557	36334	39480	36257	37826	37852	38928	31044
986	MAJOR OPERATIONAL TEST INSTRUMENTATION	10686	14519	17697	20034	20927	20948	21543	17193

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 Reagan Test Site (RTS) at 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.

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B. Program Change Summary	FY 2□□5	FY 2□□6	FY 2□□7
Previous President's Budget (FY 2□□5)	57987	563□9	57814
Current Budget (FY 2□□6/2□□7 PB)	58988	64498	6448□
Total Adjustments	1□□1	8189	6666
Net of Program/Database Changes			
Congressional Program Reductions	-89□		
Congressional Rescissions			
Congressional Increases	35□□		
Reprogrammings			
SBIR/STTR Transfer	-16□9		
Adjustments to Budget Years		8189	6666

Change Summary Explanation:
FY 2□□6/FY 2□□7: Funds realigned for more efficient operation of major development test instrumentation activities (FY 2□□6 +8189/FY 2□□7 +6666).

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

COST (In Thousands)		FY 2004 Actual	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	13697	8135	7321	8189	8398	8463	8800	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 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), 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 Theater Missile Defense (TMD) and Ground-based Mid-course Missile Defense (GMD) test missions and STRATCOM's Space Surveillance Network (SSN) and Space Object Identification (SOI) operations.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
Upgrade RTS Safety Control Center (RSCC).	1500	0	0	0
Modernize RTS Operations Control Center (ROCC) for compatibility with upgraded KMAR sensors and to provide interoperability with Pacific Ranges.	6457	4700	3498	0
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	360	2200	3200
Apply new Solid State Technology to simplify radar transmitter hardware. Enhances reliability, sensitivity and commonality of KREMS radar transmitters. Includes Transmitter Reliability Improvement Program (TRIP)	440	0	0	0
Modernize MPS-36 Radars to replace unsupportable hardware and computer systems.	3300	1333	0	0
Complete ALTAIR wheels and rails upgrade.	800	0	0	0
Initiate Film to Digital Video (FDV) replacement of 70/35mm cameras with high resolution, high speed digital video cameras and recorders.	1200	100	1623	642
Worthy Sensor Upgrades. Modernize ship's telemetry, safety, and communication capabilities to enable support of missile testing throughout the Pacific. Provides mobile instrumentation capability.	0	0	0	2000
Millimeter Wave (MMW) Performance Enhancement. Replace current Ka band transmitter with new gyro TWT based design. Enables tracking and imaging of smaller satellites and collection of intercept data at greater ranges.	0	1642	0	2347

Accomplishments/Planned Program (continued)	FY 2004	FY 2005	FY 2006	FY 2007
Totals	13697	8135	7321	8189

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February 2005

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

	COST (In Thousands)	FY 2□□4 Actual	FY 2□□5 Estimate	FY 2□□6 Estimate	FY 2□□7 Estimate	FY 2□□8 Estimate	FY 2□□9 Estimate	FY 2□1□ Estimate	FY 2□11 Estimate
984	MAJOR DEVELOPMENTAL TESTING INSTRUMENTATION	35557	36334	39480	36257	37826	37852	38928	31044

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. 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 is the development of an instrumented test area capable of creating 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). Reconfigurable Cockpit Simulator 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 for Test and Evaluation (QV) is the development of a QV integration models to enable rapid conversion of test data into visual representations. Hypervelocity Advanced Time Space Position Information (TSPI) System is the development of a tracking system with low/flat trajectories and low radar cross sections.

Hardened Subminiature Telemetry and Sensor System (HSTSS): Developed HSTSS Embeded 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 1□□,□□□(+) "G" forces. Dynamic Infrared Scene Projector (DIRSP) Complete corrective actions and integrated system for final acceptance testing.

Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
Hardened Subminiature Telemetry and Sensor System □HSTSS): Developed HSTSS Embeded 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.	600	0	0	0
Dynamic Infrared Scene Projector □DIRSP) Complete corrective actions and integrated system for final acceptance testing.	250	0	0	0
Vehicle Durability Simulator □VDS): Development of a Laboratory-based durability simulation which simulates driving on and off-road condition for both wheeled and track vehicles. This system allows for year round, 24/7 testing capabilities, provides the ability to perform accelerated life cycle testing of real world driving conditions, safely impose extreme conditions for both durability and drivetrain performance to reduce overall testing time requirements.	0	2500	0	0
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.	7925	8353	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.	13287	9899	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.	7609	10297	9572	9176
Mobile Infrared Scene Projector □MIRSP): Develop multi-spectral projection capability and participate in design of large format resistive array. Begin development of 2048x1024 pixel large format, resistive array infrared scene projector.	2005	909	170	3241
21st Century Target Control System: Develop and integrate DoD-standard multi-service target control system at WSMR.	2316	1028	730	0

Accomplishments/Planned Program (continued)	FY 2004	FY 2005	FY 2006	FY 2007
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.	1565	1665	2706	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.	0	968	1339	2100
Digital Network Migration: 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)	0	715	3438	5459
Reconfigurable Cockpit Simulator: 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	0	0	875	1245
Fiber Optic Network 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	0	0	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.	0	0	1350	2077
Quantitative Visualization for Test and Evaluation QV): Develop QV integration models to enable rapid conversion of test data into visual representations.	0	0	900	858
Hypervelocity Advanced TSPI System: Begin development of a tracking system with low/flat trajectories and low radar cross sections.	0	0	622	1377
Totals	35557	36334	39480	36257

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COST (In Thousands)		FY 2□4 Actual	FY 2□5 Estimate	FY 2□6 Estimate	FY 2□7 Estimate	FY 2□8 Estimate	FY 2□9 Estimate	FY 2□1□ Estimate	FY 2□11 Estimate
986	MAJOR OPERATIONAL TEST INSTRUMENTATION	10686	14519	17697	20034	20927	20948	21543	17193

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 1,83□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 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 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 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) 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.

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Accomplishments/Planned Program	FY 2004	FY 2005	FY 2006	FY 2007
OT-TES: Develop improved communications architecture, rotary-wing instrumentation, new encryption capabilities, geometric pairing technologies, and test instrumentation for OneTess. Complete development of weapons performance modules, player unit upgrades, and Air Defense Artillery fly-out models	9435	12293	16332	18671
Develop Operational Test Command (OTC) Analytic Simulation and Instrumentation Suite (OASIS).	1251	1226	1365	1363
Network Centric Warfare Digital Battlefield: Development of the next generation test and training integrated technologies required to support the future mission of the evolving battle space.	0	1000	0	0
Totals	10686	14519	17697	20034