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

February 2003

BUDGET ACTIVITY
6 - Management support

PE NUMBER AND TITLE
0605602A - Army Technical Test Instrumentation and Targets

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		35560	41052	54986	60018	62256	78701	80554	82387
628	TEST TECH & SUST INSTR	35560	33156	44989	49549	50369	54141	55412	56686
62B	OPERATIONAL TESTING INSTRUMENTATION DEVELOPMENT	0	6418	7537	8221	9259	12554	12858	13151
62C	MODELING AND SIMULATION INSTRUMENTATION	0	1478	2460	2248	2628	12006	12284	12550

A. Mission Description and Budget Item Justification: Increased funding beginning in FY04 provides sustainment and improvements to the Army's test infrastructure reflecting an Army leadership decision supporting Congressional and OSD interest in implementing the Defense Science Board (DSB) recommendations to increase developmental test funding. The DSB report indicated that testing is not being adequately conducted, resulting in latent defects that can be very costly and impact system's operational effectiveness and that the acquisition process is not delivering high quality, reliable and effective equipment to our military forces. Limited T&E instrumentation investments are a major contributor to the lack of testing and the problems described in the DSB report.

This Program Element provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for the United States Army Developmental Test Command (DTC), which includes: Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Missile Range (WSMR), New Mexico (including the Electronic Proving Ground (EPG), Fort Huachuca, Arizona); Yuma Proving Ground (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropical Regions Test Center, Hawaii); Aviation Technical Test Center (ATTC), Fort Rucker, Alabama; Redstone Technical Test Center (RTTC), Redstone Arsenal, Alabama; and Dugway Proving Ground (DPG), Utah. These capabilities support the development and fielding cycle of the Army Transformation as well as Joint Vision 2020 initiatives. Within this program, a major initiative called Virtual Proving Ground (VPG) is directed towards integrating Modeling, Simulation, and Internetting technologies into the test and evaluation process to support acquisition streamlining and to offset prior manpower and budget reductions. The Virtual Proving Ground will significantly improve the ability of the Army to provide early influence on system design, reduce test costs and time, and extend the envelope of information to reduce risk and acquisition costs. This initiative is critical to achieving long-term efficiencies within the acquisition process by conforming to the Simulation and Modeling for Acquisition, Requirements, and Training (SMART) and Simulation Based Acquisition (SBA) processes. Sustaining instrumentation maintains existing testing capabilities at DTC test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as incremental upgrades of instrumentation and software, to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as Stryker Armored Vehicle (SAV), Future Combat System (FCS), Theater High Altitude Area Defense (THAAD), Comanche, Patriot Advanced Capability Phase 3 (PAC 3), High Mobility Artillery Rocket System (HIMARS), M1A2 Main Battle Tank, Joint Service

Lightweight Integrated Suit Technology (JSLIST), Javelin Missile System, Family of Medium Tactical Vehicles, Army Battle Command System (ABCS), Force XXI Battle Command Brigade and Below (FBCB2) and Land Warrior. This Program Element develops and sustains developmental test capabilities that provide key support to the Army's Transformation Campaign Plan (TCP). This Program Element also includes funds transferred starting in FY03 from the Army Test and Evaluation Command's (ATEC) Operational Testing Instrumentation line, 0605712A/987, to provide greater visibility of modeling and simulation efforts as well as to support development and sustainment of operational test assets at Airborne Special Operations Test Directorate, Fort Bragg; Air Defense Artillery Test Directorate Fort Bliss; Fire Support Test Directorate, Fort Sill; Intelligence Electronic Warfare Test Directorate, Fort Huachuca; and Test and Evaluation Support Agency, Fort Hood. The development and sustainment of ATEC's Simulation Operations Rehearsal Model (STORM) is also included. Systems that will benefit from this effort are Army Tactical Command and Control System (ATCCS), Battlefield Functional Area (BFA), Advanced Field Artillery Tactical Data System Service Support Control System (AFATDS), Maneuver Control System (MCS), Forward Area Air Defense Command Control and Intelligence (FAADC2I), All Source Analysis System (ASAS), and Combat Service Support Control System (CSSCS).

B. Program Change Summary	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2003)	34719	43222	55430	60917
Current Budget (FY 2004/2005 PB)	35560	41052	54986	60018
Total Adjustments	841	-2170	-444	-899
Congressional program reductions				
Congressional rescissions		-847		
Congressional increases				
Reprogrammings	1736	-235		
SBIR/STTR Transfer	-895	-1088		
Adjustments to Budget Years			-444	-899

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

February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605602A - Army Technical Test Instrumentation and Targets**	**628**

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
628	TEST TECH & SUST INSTR	35560	33156	44989	49549	50369	54141	55412	56686

A. Mission Description and Budget Item Justification: This program provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for the United States Army Developmental Test Command (DTC), a subordinate command of the Army Test and Evaluation Command (ATEC), which includes: Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Missile Range (WSMR), New Mexico (including the Electronic Proving Ground (EPG), Fort Huachuca, Arizona); Yuma Proving Ground (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropical Regions Test Center, Hawaii); Aviation Technical Test Center (ATTC), Fort Rucker, Alabama; Redstone Technical Test Center (RTTC), Redstone Arsenal, Alabama; and Dugway Proving Ground (DPG), Utah. These capabilities are required to support the development and fielding cycle of the Army Transformation as well as Joint Vision 2020 initiatives.

Under funding of instrumentation sustainment and improvements at Army Developmental Test Ranges has contributed to a less efficient and capable technical test infrastructure. Increased funding, starting in FY 2004, provides substantial, long needed sustainment and improvements to the Army's test infrastructure.

Within this program, a major initiative called Virtual Proving Ground (VPG) is directed towards integrating modeling, simulation, and internetting technologies into the test and evaluation process to support acquisition streamlining and to offset prior manpower and budget reductions. The Virtual Proving Ground will significantly improve the ability of the Army to provide early influence on system design, reduce test costs and time, and extend the envelope of information to reduce risk and acquisition costs. This initiative is critical to achieving long-term efficiencies within the acquisition process by conforming to the Simulation and Modeling for Acquisition, Requirements, and Training (SMART) and Simulation Based Acquisition (SBA) processes. Sustaining instrumentation maintains existing testing capabilities at DTC test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as incremental upgrades of instrumentation and software, to assure adequate test data collection capabilities. This project develops and sustains developmental test instrumentation and capabilities that provide the data necessary to support acquisition milestone decisions for all commodity areas throughout the Army and in direct support of all Army Transformation Elements.

This program supports the Legacy to Objective path of the Transformation Campaign Plan.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Support of Virtual Proving Ground (VPG): provide the necessary synthetic environments, hardware in the loop capabilities and models and simulations to successfully develop and test the Army Transformation and the Objective Force. This program will continue development of test control simulation tools and test beds which integrate actual field instrumentation data with existing simulations and models to conduct test range management, test setup, simulation model validation and test result validation. Continue development of a DTC-wide High Level Architecture (HLA) compliant architecture for integrating internal and external models, software algorithms, virtual test tools, databases, and synthetic environments. Continue development and integration of fire control, ground system platforms and other simulations. Continue development of a standardization process to integrate software components for virtual testing. Continue developing and integrating common synthetic environments that include digitized terrain, signature, propagation models and climatic environments, virtual battlefield, and human effects into system-level models and simulations. Continue distributing of the synthetic environments via HLA Environment Federation. Continue development of a validated model to replicate a chemical/biological point detection system and characterization of simulant/agent properties. Continue DTC-wide development and integration of ground truth databases, information system, and synthetic environments into system level models and simulation. Continue development of a simulation model to accurately measure shock and vibration characteristics of ammunition stored on-board howitzers and acquire visualization tools to collect to support range safety.	11765	11800	17650	18364

Accomplishments/Planned Program (continued)	FY 2002	FY 2003	FY 2004	FY 2005
Development, Acquisition and Sustainment of Critical Test Instrumentation: provide and maintain the necessary test instrumentation, computer and communications systems and other test facilities to successfully develop and test the Army Transformation and the Objective Force. This program will also complete fiber optic links and digital end devices supporting small missile testing. Continue development/acquisition of: an optical data measurement system to analyze missile flight position data and mobile video instrumentation and control equipment used for tracking and capturing event data on missiles and instrumentation for nuclear effects, directed energy tests, electromagnetic environment effects and vibration environments for missile testing and digital ground-to-air radios, mobile communications equipment and digital end devices. Acquire instrumentation for reliability, availability and maintainability data collection on vehicle systems, replace ballistic transducers for measuring chamber pressures during ammunition tests and acquire high bandwidth signal conditioners for on-vehicle data collection. Initiate integration of lab equipment used for testing infrared guidance systems. For missile system tests, acquire chemistry lab equipment for analyzing hazardous wastes, radar transponders for high accuracy missile tracking and upgrade to Global Positioning System equipment for position location. Support development of common instrumentation for developmental and operational testing within all test commodity areas. Continue to replace range control instrumentation and upgrade and replace radar, optics, telemetry and data processing equipment used in large missile testing. Acquire aircraft data recorders, signal conditioning equipment and data processing equipment.	18139	15830	21083	24731
Prototype Instrumentation and Advanced Concepts. Provide quick reaction capability to respond to emergency requirements. Provide support for technical committees forging future instrumentation technology developments. Continue to develop Test Operation Procedures (TOPs) and International TOPs (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications.	520	580	1090	1140
Provide management support across the command. Conduct strategic planning, and develop roadmaps to guide current and future programs. Provide command-level oversight and management support for the DTC instrumentation program. Technical support includes requirements development, project prioritization, and execution of investments accounts for Small Business Innovation Research, Production Base Support, Army Test Technology and Sustaining Instrumentation, Major T&E Investment, and the Central T&E Investment Program. Provide management and support costs for direct interface with the T&E Executive Agent, management of needs and solutions calls for T&E Reliance oversight, and support of the Army principal of the Test Resource Advisory Group (TRAG).	5136	4946	5166	5314

Accomplishments/Planned Program (continued)	FY 2002	FY 2003	FY 2004	FY 2005
Totals	35560	33156	44989	49549

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February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605602A - Army Technical Test Instrumentation and Targets**	**62B**

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
62B	OPERATIONAL TESTING INSTRUMENTATION DEVELOPMENT	0	6418	7537	8221	9259	12554	12858	13151

A. Mission Description and Budget Item Justification: Provides for the instrumentation development, technical upgrade and maintainability of essential instrumentation to achieve a cost effective method of data collection, data reduction, data analysis, telemetry, and processing capability in support of robust and credible operational tests as required by the DOD and Congress. Increased sophistication of Army's new weapons as well as communication and control systems demands new instrumentation's ability to capture test data high in volume at a faster rate. The collected information is then reduced rapidly to only those essential elements to effectively evaluate the system under test. As Army's Transformation and Digitization of the battlefield continues, this effort allows ATEC to modernize and develop its non-major instrumentation to be less intrusive, more reliable and more robust in terms of integrating combat simulation capability into operational tests. The goal is to expand measurement and test control capability while still reducing future test costs. This project supports multiple instrumentation development efforts leading to improved command and control, increased mobility, expanded remote data collection from various tactical sites. In many instances instrumentation has transmission capability to central receiving, control, and evaluation stations at various test directorates, and new instrumentation capability in support of Real-Time Casualty Assessment which measures simulated attrition of forces during simulated battlefield engagements. ATEC's Operational Test Command (OTC's) test directorates are located at Fort Hood, TX, Fort Bragg, NC, Fort Bliss, TX, Fort Huachuca, AZ, and Fort Sill, OK. These programs support the Legacy to Objective transition path of the Transformation Campaign Plan.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Planned projects include Multi-Media Data Transfer System Enhancements, High Speed Telemetry System, Global Positioning System Modernization, Automated Intelligence/Electronic Warfare Test System (AI/EWTS Multiple Emitter Capability), Video Telemetry Recording System, Digital Terrain Database and Toolkit, Airborne Position Location System, and Image Documentation System.	0	6418	7537	8221
Totals	0	6418	7537	8221

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February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605602A - Army Technical Test Instrumentation and Targets**	**62C**

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
62C	MODELING AND SIMULATION INSTRUMENTATION	0	1478	2460	2248	2628	12006	12284	12550

A. Mission Description and Budget Item Justification: This project provides a critical foundation necessary to develop and sustain the Army Test and Evaluation Command's (ATEC) current and future modeling and simulation (M&S) instrumentation efforts. ATEC's M&S efforts include: Simulation Testing Operations Rehearsal Model (STORM), Fire Support Automated Test Suite (FSATS), Extensible C4I Instrumentation Suite-Fire Support Application (ExCIS), Command, Control and Communication Driver (C3Driver), Intelligence Modeling and Simulation for Evaluation (IMASE) C3I Engineering Evaluation System (CEES), and OTC Analytic Simulation-Instrumentation Suite (OASIS). Systems that will benefit from this effort include, but are not limited to Stryker, Army Tactical Command and Control System (ATCCS), Battlefield Functional Area (BFA), Advanced Field Artillery Tactical Data System (AFATDS), Maneuver Control System (MCS), Forward Area Air Defense Command Control and Intelligence (FAADC2I), All Source Analysis System (ASAS), and Combat Service Support Control System (CSSCS). Funding for this project was originally programmed within the Operational Testing Instrumentation (0605712A/987) line, these funds were realigned to this new project in order to provide greater visibility to modeling and simulation efforts. These programs support the Legacy to Objective transition path of the Transformation Campaign Plan.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Funds development and sustainment of high priority modeling and simulation instrumentation systems, such as the Simulation Testing Operations Rehearsal Model (STORM) and OASIS.	0	1478	2460	2248
Totals	0	1478	2460	2248