ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

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

	COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Total Program Element (PE) Cost	89281	80705	72911
628	Developmental Test Technology & Sustainment	55997	48401	43774
62B	OPERATIONAL TESTING INSTRUMENTATION DEVELOPMENT		2741	
62C	MODELING AND SIMULATION INSTRUMENTATION	33284	29563	29137

A. Mission Description and Budget Item Justification: Effective FY09, 62B and 62C were combined into one line - 62C - to accurately reflect the interwoven use of both Modeling and Simulation (M&S) and instrumentation in support of operational and developmental testing.

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; advanced development of M&S and instrumentation prototypes; and the full development of systems for the United States Army Test and Evaluation Command (ATEC), which includes the Developmental Test Command (DTC) at Aberdeen Proving Ground, Maryland and the Operational Test Command (OTC) at Ft Hood, Texas. DTC consists of seven Test Centers: Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Missile Range (WSMR), New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Proving Grounds (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropics Regions Test Center, at various locations); Aviation Technical Test Center (ATTC), Fort Rucker, Alabama; Redstone Technical Test Center (RTTC), Redstone Arsenal, Alabama; and Dugway Proving Ground (DPG), Utah. OTC consists of four forward Test Directorates (Airborne Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; Fire Support Test Directorate, Fort Sill, Oklahoma; and Intelligence Electronic Warfare Test Directorate, Fort Huachuca, Arizona) together with five other Test Directorates (Aviation; Maneuver; Battle Command and Computers; Engineer and Combat Support; and Future Force) at Ft Hood, Texas. These capabilities support the development and fielding cycle of the Army Transformation as well as Joint Vision 2020 initiatives. Sustainment funding maintains existing testing capabilities at both DTC and OTC by replacing unreliable, uneconomical, and irreparable instrumentation, as well as incremental upgrades of hardware and software for M&S and instrumentation systems to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as the Mine Resistant Ambush Protected (MRAP) vehicles, Future Combat Systems (FCS), Terminal High Altitude Area Defense (THAAD), Patriot Advanced Capability Phase 3 (PAC 3), Mobile Gun System (MGS), Warfighter Information Network - Tactical (WIN-T), Joint Tactical Radio System (JTRS), Net Enabled Command Capability (NECC), and the Army Battle Command System (ABCS) with includes Force XXI Battle Command Brigade and Below (FBCB2)/Blue Force Tracking (BFT). This Program Element develops and sustains developmental and operational test capabilities that provide key support to the Army's Transformation. In addition this Program Element supports the Long War Against Extremist Movements by providing instrumentation to support ATEC's 24/7 mission at YTC, Arizona, WSMR, New Mexico and ATC, Maryland - supporting the Joint Improvised Explosive Device Defeat Organization (JIEDDO) - as well as efforts throughout ATEC in support of the Army's Rapid Equipping the Force (REF) initiative.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

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

B. Program Change Summary	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	85862	74624	73908
Current BES/President's Budget (FY 2010)	89281	80705	72911
Total Adjustments	3419	6081	-997
Congressional Program Reductions		-269	
Congressional Rescissions			
Congressional Increases		6350	
Reprogrammings	5703		
SBIR/STTR Transfer	-2284		
Adjustments to Budget Years			-997

Congressional Adds

1. $2.4 Million Dugway Lidar and Modeling Improvements
2. $1.2 Million Mobile Optical Tracking System (MOTS)
3. $2.0 Million Joint Urban Environment Test Capability--OSD CTEIP
4. $750 Thousand Enhanced Robotic Manipulators for Defense Applications

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

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

COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
628 Developmental Test Technology & Sustainment	55997	48401	43774

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; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Proving Ground (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropic Regions Test Center, at various locations); 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 developmental testing requirements of high priority Army systems being rapidly fielded to Iraq and Afghanistan, and those systems supporting Army Transformation.

A key element is sustaining aging instrumentation which maintains existing capabilities at test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as incremental upgrades of instrumentation and software, reducing their average age to assure adequate testing 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. A series of projects refurbishes and improves Kineto Tracking Mounts and Range Radars at multiple test ranges used for aircraft, missile and air drop tests. In addition, a common field data collection instrument will be customized to collect a wide variety of performance data for various test commodities.

Another key element within this program is building the Army's network-centric test capability. This capability recognizes advances in network-centric warfare and enabling technologies for Mobile Ad Hoc Networking (MANET). In addition, DoD guidance (CJCSI 6212) mandates the certification of joint C4ISR-equipped systems as net-ready in accordance with the four pillars of Net-Ready Key Performance Parameters (NR-KPP) to enhance Interoperability and Information Assurance from a networked, system of system perspective. This capability will ensure that platforms are tested as nodes on the network while executing critical mission threads from end-to-end according to the Army's network model (platforms and sensors, applications, services, transport, and standards). A network of Distributed Test Control Centers (DTCCs), each connected to the Defense Research and Engineering Network (DREN), has been installed at each Army test range to bring all of the Army's test capabilities to bear on the complex challenge of system-of-systems testing. This technology investment follows Office of Secretary of Defense guidance for Test and Evaluation test architectures and test and training range interoperability.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
Provides command-level oversight, management and technical support for the DTC test technology and instrumentation investment accounts. Provides support to ATEC Capstone efforts in coordinating development of common instrumentation and technology needs for developmental and operational testing. Provides management and support costs for direct interface with the T&E Executive Agent, management of needs and solutions calls for T&E Reliance oversight, management of the Small Business Innovation Research (SBIR), and support of the Army principal of the Test Resource Advisory Group (TRAG).	4544	5074	4478
Develops, acquires and sustains critical test technology and instrumentation: Provides the necessary test instrumentation, computer and	37873	39693	38658

communications systems, data collection, analysis and reporting equipment and other test capabilities to successfully develop and test the Army weapons and equipment. Provides the necessary live, virtual and constructive environment, hardware-in-the-loop capabilities and models and simulations needed for testing the Army materiel. Acquires instrumentation for reliability, availability and maintainability data collection on tracked and wheeled vehicles; ballistic transducers for measuring chamber pressures during ammunition tests; supports development of common data collection instrumentation used in testing across all test commodity areas; acquires instrumentation for electromagnetic environment effects on ground and air systems; continues replacement and upgrade of range control instrumentation, radar, optics and telemetry equipment used in missile testing; acquires data recorders, signal conditioning equipment, data processing equipment and other instrumentation for various aircraft tests; upgrades natural environments test instrumentation used for testing weapon systems, vehicles, munitions and support equipment in extreme hot desert environments as well as extreme cold conditions; continues upgrade of survivability/vulnerability test capabilities in support of live fire and active protection systems; upgrades and replaces mobile range communications equipment and digital end devices; and develops advanced test technologies and instrumentation for testing next generation materiel such as advanced armor protection, multi-spectral sensors, and advanced soldier systems. Updates the frequency surveillance capability at YPG to ensure a clean radio frequency (RF) environment for testing. Recapitalizes the Antenna test range to continue measuring communication equipment performance. Upgrades Kineto Tracking Mounts at WSMR and YPG.			
Developed models, simulation, and distributed testing capabilities in the past several years to meet highly complex net-centric test environment. As the models and simulation (M&S) matured and as we continue to improve on the technology, we are able to integrate the M&S into the range infrastructure, and they have become part of the integrated solution for testing. M&S is no longer a stand-alone capability but combined into the above critical test technology and instrumentation program as they continue to be developed, acquired, and sustained.	13580		
Army Test and Evaluation Command (ATEC) Common Test Technology for Developmental Testing, Operational Testing, and Evaluation. Provides support for development of the Versatile Information System Integrated, On-line (VISION) Digital Library to enable a centrally accessible repository for test data; accreditation of ATEC Test Integration Network (ATIN) infrastructure to allow distributed, systems-of-systems testing; development of a Test and Evaluation Enterprise Architecture to facilitate use of common tools and standards; support for critical Test Technology Domain Focus Areas of Instrumentation, Modeling and Simulation, Threats, Data Management, and Networks; and support, implementation of ATEC Regulation 70-15 ("Acquisition and Management of Test Technology Assets") for development and implementation of common platforms, interfaces, and processes			638
Congressional Adds: The current Light Detection and Ranging (LIDAR) systems do not provide the full range of aerosol cloud characterization capability necessary to address the Chemical/Biological test requirements. Dugway M&S software is being developed to provide an understanding of how threat clouds affect systems under test such as detectors and shelters as they evolve on the battlefield and in urban environments driven by meteorology and terrain. The purpose of this project is to build one or more LIDAR referee systems to develop elastic backscatter LIDAR calibration procedures and models, and to merge multiple LIDAR and other referee system data with atmospheric dispersion and LIDAR models, to generate the best possible aerosol cloud characterization and tracking, and to extrapolate test results to realistic battlefield scenarios		2400	
Funding for the Small Business Innovative Research/Small Business Technology Transfer Programs		1234	
Total	55997	48401	43774

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

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

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
62B	OPERATIONAL TESTING INSTRUMENTATION DEVELOPMENT		2741	

A. Mission Description and Budget Item Justification: This project provides for the technical development, enhancement, upgrade and maintenance of essential non-major instrumentation related technology programs. The various projects will achieve cost effective data collection, data reduction, data analysis, telemetry, and processing capability in support of robust and credible operational tests as required by the Department of Defense (DOD) and Congress. The increased sophistication of the Army's new weapons as well as communication and control systems demands new instrumentation's ability to capture test data non-intrusively. The data must be collected at high rates and in massive volumes. After the essential data is collected, it must be reduced to the essential elements necessary for effective evaluation. As the Army's digitization and transformation of the battlefield continues, this development effort allows Army Test and Evaluation Command's Operational Test Command (OTC) to modernize and develop its non-major instrumentation to be more robust, reliable and less intrusive in terms of integrating automated instrumentation during operational tests. The goal is to expand data collection, reduction, and analysis of the collected data and test control capability, while reducing future operational 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 must have a transmission capability to central receiving, control, and evaluation stations at various test directorates, and the capability to support Real-Time Casualty Assessments which measures simulated attrition of forces during simulated battlefield engagements. 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 Operation Iraqi Freedom (OIF), Operation Enduring Freedom (OEF), and the Current to Future transition path of the Transformation Campaign Plan. Beginning FY 2008 funding from PE Number 0605602A Project 62B for modeling, simulation, and instrumentation development and the subsequent sustainment of all systems are identified under the PE line 0605602A Project 62C.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
Small Business Innovative Research/Small Business Technology Transfer Programs		77	
FY09 Planned Program: ExCIS, Performance Instrumentation Systems, Time Space Position Information (TSPI) and Telemetry Systems, Network Control Systems and Data Management, and Imaging System technology categories: Network Instrumentation Test Systems, Family of Digital Data Collectors Test Bed, IEW Test Operations Capability, Mobile Surveillance & Target Acquisition Radar, Multimedia Data Transfer System, Alternative Power Source for Future Combat System (FCS), ExCIS FSA, GPS Modernization, High Speed Data Recording System, Command Audio/Video Modernization, OT-TES Support, Quick Look Instrumentation Workstation, Secure Wide Band Satellite Common Link, and Digital Asset Management System.		2664	
Total		2741	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

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

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
62C	MODELING AND SIMULATION INSTRUMENTATION	33284	29563	29137

A. Mission Description and Budget Item Justification: Funding in this program element develops, enhances, and sustains the Army Test and Evaluation Command's (ATEC) on- going and future technology projects related to all Modeling, Simulation and Instrumentation (MS&I) systems necessary to test Future Combat System (FCS) and Future Force technology areas as outlined in Acquisition and Management of Test Technology Assets per ATEC Regulation 70-15, Table 1, 22 Mar 06, in the Domains and Contents of Instrumentation, Networks and Test Control, Simulation and Stimulation, and Data Management Systems. Execution of Major Programs will consist of Operational Test Tactical Engagements System (OT-TES); Test Technology Execution Center (TTEC) for M&S capability sustainment, enhancement, and integration capability; Intelligence Modeling and Simulation for Evaluation (IMASE) sustainment and development; Extensible C4I Instrumentation Systems-Fire Support Application (ExCIS-FSA) sustainment and development; Battle Command Network Integration and Simulation (BCNIS) [formerly OneSAF/CES - STORM Integration (Battle Command Systems Environment)]; Fuel Cell Systems; Operational Test Command (OTC) Analytic, Simulation and Instrumentation Suite (OASIS) Integration and Management; and execution of many non-major instrumentation projects that support T&E five domains. These systems use modeling and simulation to enhance the realistic operational environments by simulating supporting units and threat. The non-intrusive systems also collect data from the Systems Under Test (SUT) in harsh field conditions while platforms are moving and operating without impacting the SUT. All OT Technology Systems must be mobile, to the extent possible, to be used at all test locations. The systems are required for systems of systems level operational testing such as Mine Resistant Ambush Protective (MRAP) vehicles, Army Battle Command System (ABCS), Terminal High Altitude Area Defense (THAAD), Patriot Advanced Capability Phase 3 (PAC3), Warfight Information Network-Tactical (WIN-T), Joint Tactical Radio System (JTRS), Net Enhanced Command Capability (NECC), and others.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
FY08 Accomplished Programs: The individual accomplished technology projects within all the domains as described in ATEC Regulation 70-15, Table 1, 22 Mar 06, include but are not limited to: Sustainment and Operations of all OTC Technology, ADATD Base Contract, OT-TES, ExCIS FSA, GPS Modernization, Mobile Surveillance and Target Acquisition Radar, IMASE, High-speed Data Recording System, Multimedia Data Transfer System, IEW Test Operation Capability, Next Generation Command Control Communications & Intelligent Engineering & Evaluation System, TTEC, OASIS JOSIE Integration, Family of Digital Data Collection Test Bed, and STORM.	30839		
Funds development of the Command, Control and Communication Driver (C3 Driver), Test and Evaluation Enterprise Architecture (TEEA), and ATEC Technology Tools. The C3 Driver supports the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), ABCS 6.3, 6.4, Brigade Combat Team, JTRS, and WIN-T development and integration at the Central Technical Support Facility (CTSF) Fort Hood, TX and contractor locations as the Army's single DT C3 simulator/stimulator.	2445	2122	3235
FY09 and FY10 Planned Programs: Funds will be utilized for the development, upgrade and sustainment of high priority modeling, simulation, and instrumentation systems identified under the POM submission FY10-FY15. The following programs will be executed that will fall under the ATEC's domain categories shown above but are not limited to: OT-TES sustainment and minor upgrades, TTEC		26613	25902

for M&S sustainment, upgrade, and integration of system of systems, Technology Base Support, ExCIS FSA, IMASE ISSS & ISGT, Fuel Cell, BCNIS, Secure Wide-Band Satellite Common Link, GPS Modernization, High-speed Digital Recording System, OASIS Integration.			
Small Business Innovative Research/Small Business Technology Transfer Programs		828	
Total	33284	29563	29137