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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)							February 2000		
OPERATIONAL TEST AND EVALUATION,DEFENSE (0460) BUDGET ACTIVITY SIX			TEST AND EVALUATION (T&E) PE 0605804D						
\$'s in Millions	FY 1999*	FY 2000*	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	COST TO COMPLETE	TOTAL COST
PE 0605804D	94.253	99.840	53.275	53.273	55.220	56.446	57.679	Continuing	Continuing

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

***FY 1999 and FY 2000 funding for the Test and Evaluation program element is budgeted in the Director Test and Evaluation, Defense appropriation (TI 0450).**

On June 7, 1999, Secretary Cohen approved the disestablishment of the office of the Director, Test, Systems Engineering and Evaluation. In order to strengthen the role of the Director, Operational Test and Evaluation (D,OT&E) and consequently test and evaluation in OSD, the preponderance of the mission will be consolidated under the D,OT&E. The D,OT&E will manage the Threat Systems (TS), the Precision Guided Weapons Countermeasures (PGWCM), and the Joint Technical Coordinating Groups on Aircraft Survivability (JTTCG/AS) and Munitions Effectiveness (JTTCG/ME)), and the management and oversight activities related to DoD T&E functions and the Major Range Test Facilities and Bases (MRTFBs). Funds for these efforts are now budgeted in the DOT&E (0460) appropriation beginning in FY 2001.

The Undersecretary of Defense for Acquisition, Technology and Logistics/Director, Strategic and Tactical Systems (USD(AT&L)/S&TS), will retain the management and oversight of the Joint Test and Evaluation (JT&E) program and developmental testing of weapons systems. Accomplishments for FYs 1999 and 2000 are found in the Defensewide RDT&E (0400) appropriation, PE 0605804D. Beginning with FY 2001, the accomplishments and funds for these activities will be transferred to the Defensewide RDT&E (0400) appropriation, PE 0605804D.

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THESE PROGRAMS TRANSFER TO D,OT&E

Unique programs that remain in this appropriation and in this PE include the T&E Programs: TS, PGWCM, JTCG/AS; and JTCG/ME.

The T&E programs are continuing efforts that provide management and oversight of DoD T&E functions and T&E expertise to the DoD. TS provides OSD policy and oversight to Service Threat Simulator developments to ensure increased commonality, minimize duplications and provide consistent validation. TS funds the management and oversight functions for development of threat specifications and threat simulators, threat representative targets used for T&E, integration of T&E requirements for Foreign Material Acquisition (FMA), and DoD validation of threat simulators and digital threat models. PGWCM, a DoD Joint Service T&E Directorate, conducts analysis and T&E of Electro-Optical (EO), Infrared (IR), Radar, and Millimeterwave (MMW) weapons, countermeasures (CM) equipment and warning devices for the Services, T&E Agencies, and the Intelligence Community. The JTCG/AS supports joint research development test and evaluation programs to enhance the combat survivability of aircraft. This Tri-Service organization serves as the DoD focal point for aircraft survivability and represents the Joint Logistics Commanders (JLC) and their Joint Aeronautical Commanders Group (JACG) in dealings with OSD, industry, and other Service agencies. Under the auspices of the JLC the JTCG/ME publishes the Joint Munitions Effectiveness Manuals (JMEM) which contain weapons effectiveness estimates for all fielded non-nuclear weapons for the DoD. Weapons effectiveness data is available in both paper and electronic media (CD-ROMs, diskettes and via classified computer networks). JMEMs are used by the Armed Forces of the United States, NATO and other allies to plan operational missions, support training and tactics development, and support force-level analyses. The JTCG/ME also develops and standardizes methodologies for evaluation of munitions effectiveness and maintains databases for target vulnerability, munitions lethality and weapon system accuracy. JTCG/AS and JTCG/ME alternately chair the Survivability/Vulnerability Information Analysis Center (SURVIAC) Technical Coordinating Group (TCG).

This Research Category 6.5 PE supports joint military testing of the Department's weapons systems to determine if they meet their detailed performance requirements for the Joint Staff and the Services and management of the DoD test and evaluation process.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1999 Accomplishments:

JT&E Programs

- **Accomplishments for the JT&E program are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

T&E Programs

- PGWCM tested, analyzed and reported 27 EO and MMW precision guided weapons systems/components in a countermeasures environment as listed below by Component:
 - Air Force:
 - Powered-Low Cost Autonomous Attack System (P-LOCAAS), Sensor Fuzed Weapon (SFW), Special Operations Command/Directed Infrared Countermeasure (SOCOM/DIRCM), Agent Defeat Weapon (ADW)
 - Army:

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- WIDGET (code name), AH-1W/Electronic Warfare Suite (EWS), HH-60/ALQ-144A/B , HH-60/MJU-49B/52B (flares), Vehicle Visible Light Receiving -1 (VVR-1), Universal Semi-active Laser Jammer (USJ)
- Navy/Marines:
 - BISTEM (code name)/Land/Sea, Electronic Warfare Advanced Technology (EWAT), Laser Warning Receiver Systems (LWRs), Naval Research Laboratory-Laser Warning Receiver (NRL-LWR), MV-22, Advanced Electro-Optical Threat Characterization and Collection System (AEOTCCS), Small Baseline Vector Scoring (SBVS)
- Foreign: Drozd Active Protection System, Foreign Active Protection System (FAPS), Foreign Laser Illumination Night Sight (FLINS)
- Modeling and Simulation (M&S):
 - Foreign Laser Beam Rider (FLBR), Operational Test-Visualization (OT-VIS) support for Pronghorn test, Missile Constructively Simulated Operational Field Tool (MCSOFT) support for MV-22
- Other:
 - The Technical Cooperation Program (TTCP) Pronghorn Test
- Priority projects and efforts initiated by DESA in prior years and transferred to the Air Force will continue. These include non-traditional T&E support to the JCS, numerous Defense and non-Defense government agencies, National Level Programs, and the Services. Greatest preponderance of effort will be centered around T&E support to DoD ACTDs and providing T&E expertise to existing and emerging Service Battle Labs.
- Threat Systems:
 - Simulators
 - Executed the DoD validation program for threat simulators and threat digital models.
 - Continued management and oversight over Service threat simulators and threat digital models.
 - Continued threat support to T&E by investigations of current scientific and technical developments for use in Service threat representation programs (e.g., IR Missile Miss Distance Correlation, and Mission Level Modeling).
 - Continued cooperative technical research and test bed projects to facilitate threat representation (e.g., Correlation of EC Test Data and Methodology Demonstration, and Threat Simulators in Support of Information Operations).
 - Updated the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for T&E.
 - Targets
 - Continued management and oversight over Service threat representative targets.
 - Maintained the framework in updating the roadmaps that captured requirements data, facilitated the development of a strategy, and depicted the target vision of the future.
 - Provided OSD seed funds to prototype solutions to highest priority deficiencies in current target systems.
 - Supported the development of new target modeling and simulation capabilities/tools that met multi-Service T&E needs within common/DoD standard architecture (e.g., target electronic countermeasures miniaturization, common digital architecture (CDA) implementation and familiarization, and JSAT technology assessment/risk reduction).
 - Provided oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
 - Continued cooperative technical research that addressed shortfalls identified within the target validation program.
- JTCG/AS
- Initiated MANPADS vulnerability assessment methodology development.

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- Initiated vectored thrust nozzle and thermal energy management technology vulnerability reduction efforts.
- Together with JTCG/ME continued development of the Advanced Joint Effectiveness Model (AJEM), a physics based vulnerability, lethality and end game simulation.
- Initiated microwave (MW) and countermeasures (CM) technique to identify and counter next generation SAM and A-A missile threats.
- Completed advanced IR signature programming and initiate composite laser vulnerability.
- Completed laser beam-rider CM development and coherent high power electronic attack pod development.
- Completed Imaging Seeker Infrared Countermeasure (IRCM) technique development and cooperative countermeasures.
- Completed tier 2 & 3 threat algorithm analysis for use in Common Missile Warning System.
- Along with JTCG/ME, completed development of component vulnerability archive incorporating methodologies, analyses and test data for components including air vehicles, lightly armored ground vehicles and fixed hardened targets covering a range of damage mechanisms from penetration to shock vibration.
- Completed quantification of survivability improvements of a more electric aircraft over a typical hydraulic system.
 - Completed engine control and weapons bay vulnerability reductions tasks.
- JTCG/ME
 - Completed conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v2.0, WinJMEM v2.1, Joint Antiair Combat Effectiveness – Air Defense (JACE-AD) v1.0, World Infantry and Tanks Systems (WITS) beta version, v1.0, Target Vulnerability Manual v3.0 on JAWS, and Special Operation v2.0);
 - Distributed products via the classified internet with the Special Operations Target Vulnerability/Weaponeering Manual increments 5/6/7, and the Joint Product and Information Access System (JPIAS) beta version.
 - Continued expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 15, and Surface-to-Surface Direct/Indirect Fire);
 - Continued execution and technical coordination efforts to address Target Vulnerability data generation and methodology improvements (i.e., bridge, building/contents, industrial components, and rock penetration);
 - Continued the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., visualization tools, delivery accuracy, building analysis, collateral damage, smart munitions and search/target acquisition);
 - Conducted Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., COVART/FATEPEN, MEVA, Air Target Geometries, BEAMS, ORCA, ASAP, AJEM, SUBVEM and JSWM);
 - Together with the JTCG/AS, released Advanced Joint Effectiveness Model (AJEM) BETA version (with features including Fire Initiation, Ullage Explosion, Composite Materials, HEI Projectile Combined Effects, and Continuous Rods).

T&E Independent Activities:

- Major Range and Test Facility Base (MRTFB) Responsibilities
 - To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test

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Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
 - Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
 - Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
 - Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
 - Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.
- **Modeling and Simulation (M&S) Responsibilities**
- Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.
- Administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.
- **Defense Test and Evaluation Professional Institute (DTEPI)**
- Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges
 - Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
 - Completed training course Environmental Issues in Test and Evaluation
 - Completed training course Operational Effectiveness & Suitability and Live Fire Testing
 - Started development of WEB-based Just-in-Time Information on Simulation Test and Evaluation Process
- **Accomplishments for the assessment of developmental weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

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FY 2000 Accomplishments:

JT&E Programs

- **Accomplishments for the JT&E program are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

T & E Programs

- **PGWCM will test, analyze, and report on 20-25 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat warning systems as listed below by Component:**

Air Force:

- P-LOCAAS, SFW, Airborne Laser (ABL), Joint air-to-air surface stand off missile (JASSM), ADW

Army:

- Brilliant Anti-Tank (BAT) Pre-Planned Product Improvement (P3I), Javelin, Suite of Integrated Infrared CM (SIIRCM)/ Common Missile Warning System (CMWS), Precision Guided Mortar Munition (PGMM), Longbow P3I, WIDGET (Code Name) II

Navy/Marines:

- BISTEM, EWAT, LWRS, NRL-LWR, MV-22, Tactical Directed IRCM (TADIRCM), AAR-47 Sensor Upgrade (SU), AAR-47 SU/Laser Warning

Foreign:

- Laser Beam Rider (LBR), Precision Guided Munition (PGM), Active Protection System (APS), Night Sights

M&S:

- Review applicability of NAWCs Threat Signal Processing-in-the-loop/digital scene injection (TSPIL/DSI and TTCP anti-ship missile engagement models, MCSOFT Upgrade (ground-to-ground), MV-22

Other:

- TTCP, G-17 (NATO Panel), Special Working Group-4 (SWG-4 (NATO Panel)), additionally, insight for CM implications of evolving programs, identified by the Service Acquisition Executives Office, will be provided to the appropriate Program Executive Office/ Program Manager (PEO/PM), Roving Sands 2000

- Threat Systems:

Simulators

- Execute the DoD validation program for threat simulators and threat digital models.
- Continue management and oversight over Service threat simulators and threat digital models.
- Continue threat support to test and evaluation by investigations of current scientific and technical development for insertion in Service threat representation programs (e.g., Advanced system endgame methodologies).
- Continue cooperative technical research and test bed projects to facilitate threat representation (e.g., Air-to-Air Missile Miss Distance Correlation).
- Update the Automated Threat System Handbook to maintain inventory of threat representative assets available for T&E.

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Targets

- Continue management and oversight over Service threat representative targets.
- Provide OSD seed funds to prototype solutions to highest priority deficiencies in current target systems.
- Support the development of new target modeling and simulation capabilities/tools that meet multi-Service T&E needs within common/DoD standard architecture (e.g., BQM-34S Harpoon integration, target electronic countermeasures miniaturization, common digital architecture implementation, super MQM flight performance, decoy countermeasures, low earth orbit target control, and aerial target IR enhancement).
- Provide oversight of Service activities in support of the DoD validation program for Service threat representative targets.
- Continue cooperative technical research to address shortfalls identified within the target validation program.

JTCG/AS

- Initiate MANPADS ad hoc committee.
- Initiate MANPADS projects on vulnerability reduction in response to BAA.
- Develop MANPADS integrated long-range plan of action.
- Initiate MANPADS JT&E.
- Initiate efforts to become a Joint Program Office (JPO).
- Continue legacy model credibility assessments; develop transition strategies from legacy model to HLA and JMASS objects.
- Begin applying lessons learned to Spacecraft vulnerability.
- Develop robust mission level survivability analysis capability.
- Release the Advanced Joint Effort Model (AJEM), a physics based vulnerability, lethality and end game simulation.
- Along with JTCG/ME, continue to populate the component vulnerability archive.
- Continue development of advanced ullage and dry bay protection systems.
- Continue research into thermal energy management techniques on aircraft.
- Continue development of ways to reduce vulnerability of engine vectored thrust nozzles.
- Continue development of degradable chaff, and monobit multisignal instantaneous frequency measurement for threat missiles.
- Complete development and ground test of an engine Active Core Exhaust (ACE) modification to modify IR signature.
- Continue development of dual mode (RF and IR) seeker countermeasures.
- Transition technology development of active engine exhaust to a technology transfer program (TTP).
- Complete development of two color focal plane array readout for missile warning systems, integrated on-board and off-board infrared countermeasures.
- Use fuze investigation results to develop fuze modules that are compatible with current and future vulnerability and endgame simulations.
- Complete research into development of capability for in-flight controls reconfiguration due to battle damage.
- Complete work toward development of advanced transparent armor systems for aircraft windshields and rotorcraft fragment barriers.
- Complete phase development of model for Hydrodynamic Ram phenomenon and reduced vulnerability techniques for engine hot exhaust structures.

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- Continue development of bio- & functional-degradable chaff that can be used for training.
- Continue development of software methodologies and system hardware to evaluate monobit multisignal instantaneous frequency measurement; defining technology development to counter dual mode RF and Imaging IR seekers.
- Initiate work on evaluating steered agile laser beams for CM, network centric RF jamming and setting up for a flight test to evaluate effects of adjusting engine thrust on signature.
- JTCG/ME
 - Continue conversion/updates of existing JMEMS to CD-ROM format (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v2.1, WinJMEM v3.0, Joint Antiair Combat Effectiveness – Air Superiority (JACE-AS) v2.0, Joint Antiair Combat Effectiveness – Ship Antiair Warfare (JACE-Ship AAW) Beta version, JMEM/Surface-to-Surface Weaponeering Effectiveness System (JWES) v1.0, and Target Vulnerability Manual v3.x on JAWS).
 - Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) v1.0 (Books-on-line, Automated products, Models, Tri-Service Data, and Support service).
 - Continue expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 16, and Surface-to-Surface Direct/Indirect Fire).
 - Continue execution and technical coordination efforts to address Target Vulnerability data generation (e.g. Special Operations and small boat targets) and methodology improvements (e.g., buildings and content, rock penetration, agent release model, fragment penetration equation standardization, and ORCA extension).
 - Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., Joint Antiair Model (JAAM) v2.0, delivery accuracy, building collateral damage, search/target acquisition, hardened targets, safe distances/risk to friendly troops, and Mean Area Effectiveness standardization).
 - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., Air Target Geometries, BEAMS, ORCA, PENCVR3D, ASAP, AJEM, MEVA-GF, BAS, JSWM, JAAM, ARTQUIK, SAMSITE, and NGEM).
 - Together with JTCG/AS, release Advanced Joint Effectiveness Model (AJEM) v1.0 (with features including TBM Body-to-Body, Explosive Initiation, Hydrodynamic Ram, and Blast/Frag Combined Effects), and Joint Component Vulnerability Archive v1.0.
- DESA:
 - Fund buyouts to bring AFOTEC back within their QDR target.

T&E Independent Activities

- DOT&E Major Range and Test Facility Base (MRTFB) Responsibilities
 - To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor

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personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
- Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
- Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
- Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
- Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.

- DOT&E Modeling and Simulation (M&S) Responsibilities

Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.

- DOT&E administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.

- DOT&E Policy and Guidance Analysis

- DOT&E administers policy guidance and analysis, impact reviews of correspondence from Executive, Legislative, and DoD sources, and their impact on the DOT&E mission.
- Provide engineering consultation support at the program manager level in the areas of business process reengineering, requirements analysis, studies, strategic and action planning, performance measures and indicators, and others.
 - Development of strategic planning concepts and approaches
 - Analysis of capabilities, requirements, processes, and partnering opportunities
 - Special study support in planning and analysis; developing basic concepts, strategies and approaches; and developing executive decision models

- Defense Test and Evaluation Professional Institute (DTEPI)

- Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges

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- Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
- Complete training course Modeling and Simulation in Test and Evaluation
- Development of WEB-based Just-in-Time Information on:
 - Early Operational Assessment course
 - Design of Experiments course
 - Live Fire Testing primer
 - Effectiveness and Suitability introduction
 - Environmental Issues Overview
- **Accomplishments for the assessment of the developmental testing of weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

FY 2001 Plans:

JT&E Programs

- **Accomplishments and funds for the JT&E program are now in the Defense-wide RDT&E appropriation (0400) in PE 0605804D.**

T & E Programs

- PGWCM will test, analyze, and report on 20-25 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat warning systems as listed below by Component:
 - Air Force:
 - P-LOCAAS, SFW, ABL, JASSM, Enhanced LGB (ELGB), ADW
 - Army:
 - BAT P3I, Javelin, SIIRCM/CMWS, PGMM, Longbow P3I, Unmanned Aerial Vehicle (UAV), Multi-spectral CM (MSCM), XM-982
 - Navy/Marines:
 - BISTEM, EWAT, LWRS, NRL-LWR, MV-22, TADIRCM, Extended Range Guided Munition (ERGM), Joint Stand-Off Weapon (JSOW), F/A-18 Night Attack System (NAS), Standoff Land Attack Missile-Automatic Target Acquisition (SLAM-ATA), AAR-47/LWR, Advanced Amphibious Assault Vehicle (AAAV), Roving Sands 2000, Multi-Spectral Countermeasures (MSCM)
 - Foreign:
 - Laser Beam Rider (LBR), Precision Guided Munition (PGM), Active Protection System (APS)
 - M&S:
 - MCSOFT Upgrade(starring array models)
 - Other:

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- TTCP, G-17, SWG-4, CINC Joint training (Ulchi Focus Lens), Roving Sands, additionally, insight for CM implications of evolving programs, identified by the Service Acquisition Executives Office, will be provided to the appropriate Program Executive Office/ Program Manager (PEO/PM)
- Threat Systems
 - Simulators
 - Execute the DoD validation program for threat simulators and threat digital models.
 - Continue management and oversight over Service threat simulators and threat digital models.
 - Continue threat support to T&E by investigations of current scientific and technical developments for insertion in Service threat representation programs (e.g., broadband tactical laser illuminator, differential SAMs and external target coordinates, and Upgrade to Advanced RF SAM).
 - Continue cooperative technical research and test bed projects to facilitate threat representation (e.g., air-to-air missile on a mountain, threat modeling and simulation test bed, intelligent threat entity development, MATLAB/simulink air-to-air missile modeling, and re-engineered software for tactical RF SAM).
 - Update the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community.
 - Targets
 - Continue management and oversight over Service threat representative targets.
 - Provide OSD seed funds to prototype solution to highest priority deficiencies in current target systems.
 - Support the development of new target modeling and simulation capabilities /tools that meet multi-Service T&E needs within common/DoD standard architectures (e.g., radar variations, conformal array antennas for targets, aerial target IR enhancement, aerial target modeling, common digital architecture implementation, and low earth orbit target control system).
 - Provide oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
- JTCG/AS
 - Initiate MANPADS coordinated database development.
 - Initiate MANPADS coordinated methodology prediction and assessment efforts.
 - Initiate MANPADS coordinated vulnerability and susceptibility reduction technique development.
 - Begin RF & High Power Microwave (HPM) weapons vulnerability reduction efforts.
 - Transition to full JPO status.
 - Begin unmanned air vehicle vulnerability determination/reduction.
 - Analyze aircraft armor attachment qualification techniques and advance armor concepts.
 - Analyze improvements to advanced composite materials manufacturing techniques including thermoplastic, thermosets and bonding of joints.
 - Analyze rotorcraft reconfigurable flight control systems and integrated flight/propulsion control.
 - Continue development and integration of physics-based damage algorithms into AJEM.
 - Conduct dry bay parameter sensitivity study.
 - Continue development of countermeasure techniques for new modes of seeker technology.

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- Continue transition to JMASS objects, mission effectiveness modeling, links to cost model and model credibility enhancements.
 - Complete development of advanced ullage and dry bay protection systems.
 - Complete development of degradable chaff, and monobit multisignal instantaneous frequency measurement.
 - Complete development of imaging missile IR countermeasures, dual mode (RF and IR) seeker countermeasures.
 - Complete research into thermal energy management techniques on aircraft.
 - Complete development of ways to reduce vulnerability of engine vectored thrust nozzles.
- JTCG/ME
- Continue conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponing System (JAWS) v3.0, WinJMEM v4.0, Joint Antiair Combat Effectiveness – Air Defense (JACE-AD) v1.x, JMEM/Surface-to-Surface Weaponing Effectiveness System (JWES) v1.x, and Target Vulnerability Manual v4.0 on JAWS).
 - Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) v2.0 (Books-on-line, Automated products, Models, Tri-Service Data, and Support service).
 - Continue expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 17, and Surface-to-Surface Direct/Indirect Fire).
 - Continue execution and technical coordination efforts to address Target Vulnerability data generation (e.g., Special Operations) and methodology improvements (e.g., counter proliferation, fragment penetration, ORCA extension, and target model generation).
 - Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., collateral damage, hardened targets, and dual stage warheads).
 - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., AJEM, MEVA, MUVES, and ASAP).
 - Together with the JTCG/AS, release Advanced Joint Effectiveness Model (AJEM) v2.x (Generalized Body-to-Body and Internal Blast), and Joint Component Vulnerability Archive v1.x.

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T&E Independent Activities

- DOT&E Major Range and Test Facility Base (MRTFB) Responsibilities

To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
- Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
- Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
- Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
- Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.

- DOT&E Modeling and Simulation (M&S) Responsibilities

Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.

- DOT&E administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.

- DOT&E Policy and Guidance Analysis

- DOT&E administers policy guidance and analysis, impact reviews of correspondence from Executive, Legislative, and DoD sources, and their impact on the DOT&E mission.
- Provide engineering consultation support at the program manager level in the areas of business process reengineering, requirements analysis, studies, strategic and action planning, performance measures and indicators, and others.
 - Development of strategic planning concepts and approaches
 - Analysis of capabilities, requirements, processes, and partnering opportunities

R-1 Shopping List – Item No 4 - 13 of 15

Exhibit R-2, RDT&E Budget item Justification

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- Special study support in planning and analysis; developing basic concepts, strategies and approaches; and developing executive decision models
- Defense Test and Evaluation Professional Institute (DTEPI)
 - Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges
 - Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
 - Develop training course on following proposed topics:
 - International Test & Evaluation
 - Interoperability Test & Evaluation
 - Environmental Issues for Executives
 -
- **Funds for these activities are in the D,OT&E (0460) appropriation, PE 0605804D.**
- **Accomplishments and funds for the assessment of the developmental testing of weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

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B. (U) PROGRAM CHANGE SUMMARY

(\$ in Millions)	<u>FY 1999*</u>	<u>FY 2000*</u>	<u>FY 2001</u>
FY 2000 President's Budget	94.253	99.840	99.633
Appropriated Value	94.253		
Adjustments to Appropriated Value			
Joint Test and Evaluation Realigned to Defense-wide RDT&E (0400) Appropriation			(46.120)
Nonpay Purchase Inflation Adjustment			(238)
Current Budget Submit	94.253	99.840	53.275

C. (U) OTHER PROGRAM FUNDING SUMMARY: NA