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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)			July 2001		
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX			TEST AND EVALUATION (T&E) PE 0605804D8Z		
\$'s in Millions	FY 2000 <sup>1</sup>	FY 2001 <sup>2</sup>	FY 2002	COST TO COMPLETE	TOTAL COST
PE 0605804D8Z	99.840	52.786	59.447	Continuing	Continuing

**Notes:** <sup>1</sup> - PE 0604940D8Z and PE 0605804D8Z were in appropriation 0450 (Developmental Test and Evaluation, Defense (DTE,D)) through FY 00. The SECDEF approved disestablishment of DTE,D in June 1999.  
<sup>2</sup> - Beginning in FY 2001, PE 0604940D8Z transferred in its entirety to appropriation 0460 (Operational Test and Evaluation, Defense (OTE,D)) and PE 0605804D8Z was split between appropriations 0460 and 0400 (Defense-wide RDT&E).

**A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION**

This program element consists of two programs: Test and Evaluation (T&E) Programs and T&E Independent Activities.

T&E Programs consists of four activities: Threat Systems (TS); Center for Countermeasures (CCM) (formerly known as Precision Guided Weapons Countermeasures); Joint Technical Coordinating Groups on Aircraft Survivability (JTTCG/AS) and Munitions Effectiveness (JTTCG/ME). Program Decision Memorandum I increased the JTTCG/ME FY 2002 budget by \$5.1 to provide Joint Munitions Effectiveness Manual (JMEM) for all weapon systems and to reduce the JMEM distribution cycle to 14 months.

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 systems and target developments to ensure increased commonality, minimize duplications and provide consistent threat representation validation for T&E. TS funds the management and oversight functions for development of common use threat specifications for threat simulators, threat representative targets and digital threat models used for T&E; integration of T&E requirements for Foreign Material Acquisition (FMA); DoD validation of threat simulators, threat representative targets, and digital threat models; analysis of advanced threat technology applications for simulators and targets; and investigation of new approaches and methods for conducting operational testing of systems and their interoperability in a realistic threat environment. CCM, 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 JTTCG/AS supports the joint service community to enhance the combat survivability of aircraft. This Tri-Service organization serves as the DoD focal point for aircraft survivability

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methodology and data. This Joint Aeronautical Commanders Group (JACG) chartered program also acts as the DoD focal point for aircraft vulnerability/survivability information, modeling, and simulation methodology, as well as the Executive Agent for the Joint Live Fire Aircraft Program managed by the Live Fire Test office of the DOT&E. The JTCG/AS also develops and standardizes methodologies for the evaluation of aircraft survivability (susceptibility and vulnerability) to threat weapons. The JTCG/ME was chartered by the Joint Logistics Commanders (JLC) over 30 years ago to serve as DoD's focal point for authenticated non-nuclear munitions effectiveness information (Joint Munitions Effectiveness Manuals or JMEMs) on all US major non-nuclear weapons. Their efforts include validating, standardizing, and disseminating M&S methodologies for evaluating the lethality of our systems. The JTCG/ME, under the auspices of the JLCs, authenticates data published by the JTCG/ME for use in training, systems acquisition, weaponing, procurement, and combat modeling. 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 co-chair the Survivability/Vulnerability Information Analysis Center (SURVIAC) Technical Coordinating Group (TCG). DTEPI provides computer-based training and on-line WEB-based training to the DoD Test and Evaluation community in technical T&E subjects.

**T&E Independent Activities** is the only source of funding for the DOT&E for studies, analyses, management and technical support, on a continuing basis, in support of policy development, decision-making, management and oversight of the DoD T&E infrastructure, including stewardship of the Major Range and Test Facility Base (MRTFB). Studies and analyses examine the implications and consequences of current and proposed policy, plans, operations, strategies, and budgets and are essential for the oversight and management of DOT&E mission.. Funds are used to perform official travel related to the activities within this program element. *Due to the volume of work in this category, examples of the accomplishments and plans are listed in Program Accomplishments and Plans.*

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 2000 Accomplishments:**

##### **T & E Programs**

- CCM tested, analyzed, and reported on 32 US EO, MMW, and foreign PGW systems/components in a countermeasure environment as listed below:

##### Air Force:

- Powered-Low Cost Autonomous Attack System (P-LOCAAS), Sensor Fuzed Weapon (SFW), Airborne Laser (ABL), Agent Defeat Weapon (ADW), Enhanced Paveway, Advanced Strategic and Tactical Expendables (ASTE), Air-to-Ground Weapon System Evaluation Program (A/G WSEP), LITENING, HH-60 SPS (Self-Protection System), A-10/F-16 Force Development Evaluation, Red Team

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Exhibit R-2, RDT&E Budget Item Justification

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### Army:

- Brilliant Anti-armored Tank (BAT), Javelin, Suite of Integrated Infrared CM/Common Missile Warning System (SIIRCM/CMWS), Laser Warning Receiver System (AN/AVVR-1), Longbow Missile

### Navy/Marines:

- BISTEM, Laser CM (LaCM), High Angular Resolution Laser Irradiance Detector (HARLID), Electronic Warfare Advanced Technology (EWAT), Laser Warning Receiver System (LWRS), NRL-LWR, MV-22, Tactical Directed IRCM (TADIRCM), AN/AAR-47 Sensor Upgrade (SU), AAR-47 SU/Laser Warning, MJU-52, Joint Stand Off Weapon (JSOW), Laser Beamrider Detector System, WIDGET II (code name)

### Foreign:

- Foreign Laser Beam Rider (FLBR), Foreign Precision Guided Munition (FPGM), Foreign Active Protection System (Drozd), Night Sights, Foreign Optical Sight Detection (FOSD), Foreign Laser Illuminator & Night Sight (FLINS)

### M&S:

- Reviewed applicability of Naval Air Warfare Center's (NAWCs) Threat Signal Processing-In-the-Loop/Digital Scene Injection (TSPIL/DSI) and The Technical Cooperative Program (TTCP) anti-ship missile engagement models; upgraded Missile Constructively Simulated Operational Field Tool Measurement System [(MCSOFT) (flares, manpads, targets)]; MV-22 Multi-Service Operational Test, Vertical Take-off Naval Unmanned Aerial Vehicles (VTUAV), Direct View Optical (DVO) Tests; conducted CV-22 Tilt-rotor CM Developmental/Operational Tests (DT/OT)

### Other:

- The Technical Cooperation Program (TTCP) PRONGHORN tests, G-17 and Special Working Group-4 (SWG-4) NATO Panels
- Provided CM inputs for evolving programs, identified by the Service Acquisition Program Executive Offices/Program Managers (PEOs/PMs)
- Countermeasure (CM) Warfare Initiative: Conducted approximately 36 briefs at the Service Joint and Component level and CG USAREUR, CG 7th ATC, and the Combat Maneuver Training Center advocating the program, with the following results:
  - Injected CM scenarios during Roving Sands 2000 (RS00)/Purple Dragon
  - Provided RS00/Purple Dragon after-action reports to USJFCOM, 18th ABN, FORSCOM, and DOT&E
  - Provided input to the Joint Center for Lessons Learned
  - Developed CM/CCM tutorials for the Warfighting CINCs

### - Threat Systems:

#### Simulators

- Executed the DoD validation program for threat simulators and threat digital models.
- Continued management oversight of Service threat simulators and threat digital models.
- Continued 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, Clutter Generation For Semi-Active & Air-To-Air Missiles, and IR Missile Miss Distance Correlation).

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- Continued cooperative technical research and test bed projects to facilitate threat realism (e.g., Modeling and Testing of and Advanced Threat Aircraft Model).
- Provided tools to exchange the latest scientific and technological information between the test and evaluation and intelligence communities.
- Updated the Automated Joint Threat Systems Handbook to maintain inventory of threat representative assets available for T&E.

### Targets

- Continued management oversight of Service threat representative targets.
- Provided OSD seed funds to prototype solutions to highest priority deficiencies in current target systems (e.g., Air Force Subscale Aerial Target Feasibility Study, and Threat "D" ASCM Study).
- Supported 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, Aerial Target IR Enhancement, and BQM- 43 Seeker Follow-on).
- Provided oversight of Service activities in support of the DoD validation program for Service threat representative targets.
- Continued cooperative technical research to address shortfalls identified within the target validation program.

### JTCG/AS

- Initiated the Man-Portable Air Defense Systems (MANPADS) ad hoc committee.
- Initiated MANPADS projects on vulnerability reduction.
- Developed MANPADS integrated long-range plan of action.
- Initiated MANPADS JT&E Joint Feasibility Study.
- Continued legacy model credibility assessments; develop transition strategies from legacy model to HLA and JMASS objects.
- Released the Advanced Joint Effectiveness Model (AJEM), a physics-based vulnerability, lethality and end game simulation on 9/29/00.
- Along with JTCG/ME, continued to populate the component vulnerability archive.
- Continued development of advanced ullage and dry bay protection systems.
- Performed research on thermal energy management techniques on aircraft.
- Identified ways to reduce vulnerability of engine vectored thrust nozzles.
- Investigated degradable chaff, and monobit multisignal instantaneous frequency measurement for threat missiles.
- Completed development and ground test of an engine Active Core Exhaust (ACE) modification to modify IR signature.
- Enhanced capability of dual mode (RF and IR) and imaging seeker countermeasures.
- Transitioned technology development of active engine exhaust to a technology transfer program (TTP).
- Completed development of two color focal plane array readout for missile warning systems, integrated on-board and off-board infrared countermeasures.

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- Used fuze investigation results to develop fuze modules that are compatible with current and future vulnerability and endgame simulations.
  - Completed research into development of capability for in-flight controls reconfiguration due to battle damage.
  - Completed work toward development of advanced transparent armor systems for aircraft windshields and rotorcraft fragment barriers.
  - Completed phase development of model for Hydrodynamic Ram phenomenon and reduced vulnerability techniques for engine hot exhaust structures.
  - Advanced the capability of software methodologies and system hardware to evaluate monobit multisignal instantaneous frequency measurement.
  - Initiated 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.
  - Initiated the ATIRCMS/CMWS end to end simulation upgrade project.
  - Initiated the methodology to assess helicopter susceptibility to mines project.
- JTCG/ME
- Completed conversion/updates of existing JMEMs and JTCG/ME Special Reports to CD-ROMs (i.e., JMEM Air-to-Surface Weaponing System (JAWS) v2.1, Joint Anti-air Combat Effectiveness - Air Defense (J-ACE: AD) v1.0, JMEM/Surface-to-Surface Weaponing Effectiveness System (JWES) v1.0, Special Operations Target Vulnerability & Weaponing Manual v2.0, and Target Vulnerability Manual for JAWS v2.1.
  - Developed releasable version of JWES for ROK including MLRS-ER.
  - Continued conversion/updates of existing JMEMs and JTCG/ME Special reports to CD-ROMs (i.e., JMEM Air-to-Surface Weaponing System (JAWS) v.2.2, Joint Anti-air Combat Effectiveness – Air Superiority (J-ACE: AS) v2.0, Joint Anti-Air Combat Effectiveness - Air Defense (J-ACE: AD) v2.0, Joint Anti-air Combat Effectiveness – Ship Anti-air Warfare (J-ACE: Ship AAW) Prototype version, and JMEM/Surface-to-Surface Weaponing Effectiveness System (JWES) v2.0.
  - Distributed 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).
  - Continued expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – Revision 4, and Surface-to-Surface Direct/Indirect Fire).
  - Continued execution and technical coordination efforts to address Target Vulnerability data generation and methodology improvements (e.g., buildings and content, rock penetration, agent release model, interdiction, fragment penetration equation standardization, and ORCA extension).
  - Continued 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 analysis, collateral damage, search/target acquisition, hardened targets, safe distances/risk to friendly troops, ship-to-ship gun effectiveness, dual stage warhead, directed energy weapons and Mean Area Effectiveness standardization).

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- Conducted Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., Air Target Geometries, BEAMS/ABEL, ORCA, PENCVR3D, ASAP, AJEM/MUVES-S2, MEVA-GF, BAS, JSEM, JSWM, JAAM, ARTQUIK, SAMSITE, MAE, and NGEM).
- Together with JTCG/AS, released Advanced Joint Effectiveness Model (AJEM) v1.0 (Anti-air effectiveness, lethality, and vulnerability assessment tool for acquisition, LFT, and JTCG/ME communities). Continued to work the release of Advanced Joint Effectiveness Model (AJEM) v2.0 (with features including TBM Body-to-Body, Explosive Initiation, Hydrodynamic Ram, and Blast/Frag Combined Effects), and Joint Component Vulnerability Archive v1.0.
- Conducted CINC data calls for identification of new threats in support of FY01 program build requirements.

### **T&E Independent Activities**

- Major Range and Test Facility Base (MRTFB) Support:
  - Analyzed MRTFB institutional and customer data in support of policy decisions regarding the composition and management of the MRTFBs.
  - Monitored and evaluated the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities.
  - Developed and issued a summary and database of MRTFB capabilities in coordination with the Military Departments.
  - Analyzed MRTFB data and proposed issues for the Annual MRTFB Review. Prepared a Summary Report and follow-up on actions.
  - Analyzed T&E PPBS information for identification and resolution of potential shortfalls during POM and budget reviews.
- Spectrum Support:
  - Analyzed the use of higher frequency spectral bands for T&E telemetry.
  - Assessed developments at worldwide conferences on potential threats to spectra used by T&E.
  - Developed plan for RF Spectrum Encroachment in support of Sustainable Range Working Group.
  - Analyzed and made recommendations on spectrum issues for national and international use.
- Telemetry Support:
  - Developed architecture for Real Time Telemetry Network (RTTN).
  - Continued support to International Consortium for Telemetry Secretary
  - Developed plans for the instrumentation of radio frequency link for Space Technology Research Vehicle
- Special Studies:
  - Analyzed and recommended OMNIBUS Legislation for Commercial Charge Policy.
  - Conducted Multi-Service Target Control Sys (MSTCS) study to calculate power flux density at Point Mugu.
  - Study on the elimination of the ARIA test aircraft.
  - Analyzed Big Crow program and Aberdeen Pulsed Radiation Facility and made funding recommendations.
  - Analyzed and updated DoD "International Test Facilities and Ranges Summary of Capabilities."
  - Provided data and made recommendations for funding testing at Dugway Proving Grounds.
  - Test Resources Master Plan roadmapping.
  - Technical analyses and recommendation for the Joint Test and Training Range Roadmap.

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- ATPS:
  - Provided an automated Defense-Wide system to plan, produce and coordinate Test and Evaluation Master Plans (TEMPs) and test plans. ATPS also serves as a source of test planning information. Approximately 1,400 users from 400 program offices use ATPS.
  - Managed and maintained the system to include upgrade of the system with new Windows and Macintosh operating systems.
  - Upgraded system to meet Y2K and new IT security standards.
  - Initiated conversion to open systems architecture using state-of-the-tools.
- Defense Test and Evaluation Professional Institute (DTEPI)
  - Developed and updated DoD-wide T&E course and training materials to include computer based and WEB-based training. Course and training projects included (examples):
    - Developed computer based training course on following proposed topic:
      - Modeling and Simulation it Test and Evaluation
    - Developed WEB-based Just-in-Time Information on:
      - Design of Experiments course
      - Live Fire Testing primer
      - Effectiveness and Suitability introduction
- T&E M&S:
  - Provided technical and analytical expertise in support of DOT&E work in M&S.
  - Analyzed and made recommendations of JWARS IOC Test Scenarios.
  - Developed T&E M&S information for use by the Integrated Product Team (IPT) for the Comanche.
  - Analyzed, assessed and made recommendations for the Joint Electronic Combat Simulation Final Report.
  - Provided technical expertise Joint Modeling and Simulation System TEMP.
- Director, Operational Test and Evaluation Enterprise Knowledge Management System (DEKMS):
  - Continue the design and development of a Knowledge Management System, adding robust functionality to enable rapid decision-making on time critical events. The system will be extended to the majority of the DOT&E enterprise and will include Test and Evaluation templates, guidelines and best practices for DOD personnel. This effort will fully support the Department's goal and vision.
- Official Travel and Administrative Support:
  - Perform official travel in support of the DOT&E oversight of T&E infrastructure.
  - Procure administrative support to carry out oversight of DOT&E programs.
- Accounting and Financial Management Support
  - Provided accounting and financial management support to the Office of the Director.

### **FY 2001 Accomplishments:**

#### **T & E Programs**

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- CCM tested, analyzed, and reported on 20-25 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat-warning systems as listed below:
  - Air Force:
    - P-LOCAAS, SFW, SFW P3I, ABL, Joint Air-to-Surface Stand-off Missile (JASSM), Enhanced Paveway, ADW, Joint Direct Attack Munition (JDAM), A/G WSEP, Red Team, Litening, C-17
  - Army:
    - BAT P3I, Javelin, SIIRCM/CMWS, PGMM, Longbow P3I Missile, Unmanned Aerial Vehicle (UAV), XM-982, Tank Extended Range Munition-Kinetic Energy (TERM-KE), LBR Detector, Tube-launched Optically-guided Wire Commanded (TOW) Fire & Forget/Modernized HELLFIRE, Comanche
  - Navy/Marines:
    - EWAT, LWRS, NRL-LWR, MV-22, TADIRCM, Extended Range Guided Munition (ERGM), JSOW Unitary Seeker, F/A-18 Night Attack System (NAS), Standoff Land Attack Missile-Automatic Target Acquisition (SLAM-ATA), AAR-47/LWR, Advanced Amphibious Assault Vehicle (AAAV), NATO EMBOW Trials, Integrated Electronic Warfare System/Multi-Antiship Missile Tactical Electronic System (IEWS/MATES)
  - Foreign:
    - Foreign Rangefinder Exploitation Evaluation-G (FREE-G), Night Attack Vision Exploitation (NAVE-G), Foreign GPS, Foreign Laser Beamrider (FLBR) Phase I (code names for classified projects)
  - M&S:
    - CV-22 Tilt-rotor DT/OT, VTUAV, Broadband Infrared Device Simulations (BIRD); DVO tests, JSOW
  - Other:
    - TTCP, NATO Panels G-17 and SWG-4, CINC Joint Training (Ulchi Focus Lens), and Roving Sands 2001 (RS01)
    - Provided CM inputs for evolving programs, identified by the Service Acquisition PEOs/PMs
    - Continued efforts promoting the CM Warfare Initiative, and direct plans for participation in operational warfighting exercises and simulations
- Threat Systems
  - Simulators
    - Executed the DoD validation program for threat simulators and threat digital models.
    - Continued management oversight of Service threat simulators and threat digital models.
    - Continued threat support to T&E by investigations of current scientific and technical developments for insertion in Service threat representation modeling programs (e.g., Integration of RT SAM models w/DIADS, IR SAM Flyout Model Upgrade, Standard UV Plume Model, and Enhanced IADS Messaging in a Simulation/Stimulation Environment).
    - Continued cooperative technical research and test bed projects to facilitate threat representation (e.g., complete Advanced Threat Aircraft Model testing, Real-Time Digital Receiver Processing for Multiple Threat Systems, IR Countermeasures Evaluation System, and Mobile Broadband Tactical Laser Illuminator).
    - Updated the Automated Joint Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community.

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- Defined and planned a process to effectively utilize threat simulators as true distributed test resources in support of multi-service interoperability testing in a realistic threat environment.
- Managed a collaborative effort to provide support for interoperability testing in a realistic threat environment.

### Targets

- Continued management oversight of Service threat representative targets.
- Provided OSD seed funds to prototype solution to highest priority deficiencies in current target systems (e.g., Electronic Countermeasures Miniaturization, Air Superiority Target Study, and Aerial Target IR Enhancement).
- Supported 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, Subscale Aerial Target Infrared Signature Augmentation, and Decoy Countermeasures System).
- Provided oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
- Defined and planned a process to effectively utilize threat representative targets as true distributed test resources in support of multi-service interoperability testing in a realistic threat environment.
- Managed a collaborative effort to provide support for interoperability testing in a realistic threat environment.

### JTCG/AS

- Completed work on the advanced ullage protection project.
- Completed the survivable engine control demonstration project.
- Completed work on the weapons bay ablative characterization project.
- Completed work on the mono-bit multi-signal IFM development project.
- Completed work on the dual mode seeker countermeasures project.
- Completed work on the advanced wideband mode 'former' technology project.
- Completed work on the MANPADS penetration methodology project.
- Completed the network-centric stand-in jammer project.
- Completed the very wideband accurate direction finding project.
- Completed the acquisition deskbook survivability project.
- Continued the fuze simulation and phenomenology investigation.
- Continued the ATIRCM/CMWD end to end simulation upgrade.
- Continued work on the advanced survivable rotorcraft project.
- Continued participation on the COVART/FASTGEN and air-to-air (BRAWLER) configuration control boards.
- Continued MANPADS coordinated database development.
- Continued MANPADS coordinated methodology prediction and threat assessment efforts.
- Continued MANPADS coordinated vulnerability reduction techniques development.
- Continued work on the advanced spacecraft vulnerability analysis.
- Continued the WINFIRE/ULLEX project.
- Completed revision of the second edition of the aircraft survivability textbook to be published in FY 2002 by AIAA.

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- Completed the acquisition desk-book survivability project.
- Continued the methodology to assess helicopter susceptibility to mines project.
- Continued to support the SURVIAC Model Manager and Model Accreditation.
- Co-fund the ACE flight test on a C-17.
- Initiated the proof of concept for weapons bay project.
- Initiated the engine damage detection project.
- Initiated the passive fire mitigation project.
- Initiated the Aerogels for retrofitted increases in aircraft survivability project.
- Initiated the dynamic loading methodology project.
- Initiated the bonded wing survivability project.
- Initiated the miniaturized countermeasures for UAVs.
- Initiated the air countermeasure with ultra-fine aluminum project.
- Initiated the joint service surrogate seeker project.
- Initiated the Tier II/III laser susceptibility project.
- Initiated the M&S support for acquisition programs project.
- Initiated the Surface to Air Missile credibility assessment project.
- Initiated follow-on modeling requirements for AJEM.
- Initiated the survivability in higher level analyses and return on investment for aircraft survivability.
- JTCG/ME
  - Continued conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v2.2/v3.0, Joint Anti-air Combat Effectiveness – Air Defense (J-ACE: AD) v2.0, Joint Anti-air Combat Effectiveness - Air Superiority (J-ACE: AS) v2.0/v3.0, Joint Anti-air Combat Effectiveness - Ship Anti-air Warfare (J-ACE: Ship AAW) v1.0, JMEM/Surface-to-Surface Weaponeering Effectiveness System (JWES) v2.0/v3.0, and Target Vulnerability Manual v2.2 on JAWS).
  - Distributed 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).
  - Continued expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – Revision, and Surface-to-Surface Direct/Indirect Fire).
  - Continued execution and technical coordination efforts to address Target Vulnerability data generation (e.g., industrial targets, NCAA targets, small boats, building structures, SATCOMs and TBMs) and methodology improvements (e.g., counter proliferation, titanium fragment penetration/equation standardization, ORCA extension, and target model generation).
  - Continued the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Anitair effectiveness calculations (i.e., collateral damage module, hardened targets module, building analysis module, JAAM, JAWS target acquisition, GPS accuracy and multiple weapon types).

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- Conducted Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., JSEM, AJEM, MEVA-GF, MUVES-S2, BEAMS/ABEL, GENESIS-BAT, PENCURV, ORCA, ICEM, MAE, and ASAP).
- Together with the JTCG/AS, released Advanced Joint Effectiveness Model (AJEM) v2.x (Generalized Body-to-Body and Internal Blast), and Joint Component Vulnerability Archive v1.x.
- Continued CINC data calls in support of FY02 program build requirements.
- Developed commonwealth JAWS CD-ROM (i.e., UK, Australia, and Canada) to meet CINC-endorsed foreign release requirements.

### T&E Independent Activities

- Major Range and Test Facility Base (MRTFB) Support:
  - Analyzed MRTFB institutional and customer data in support of policy decisions regarding the composition and management of the MRTFBs.
  - Monitored and evaluated the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities.
  - Developed and issued a summary and database of MRTFB capabilities in coordination with the Military Departments for use in assessing future capability requirements.
  - Analyzed MRTFB data and proposed issues for the Annual MRTFB Review. Prepared a Summary Report and follow-up to ensure implementation of DOT&E solutions to issues.
  - Analyzed T&E PPBS information for identification and resolution of potential shortfalls during POM and budget reviews.
- Spectrum Support:
  - Submitted report key resolution approaches addressing spectrum augmentation at higher frequencies.
  - Assessed development associated with initiatives to reallocate spectrum from Federal allocations.
  - Continued support to Range Spectrum Requirements Working Group
- Telemetry Support:
  - Presented technical briefings to the International Consortium for Telemetry Secretary
  - Continued to support Real Time Telemetry Network (RTTN) initiatives.
  - Conducted study assessing the capability of MSTC System at different bands.
- Special Studies (Examples):
  - Evaluated and provided recommendations on the Navy's proposal to eliminate Atlantic Fleet Weapons Training Facility and add Pacific Missile Range Facility to the MRTFB.
  - Assessment of the Multi-Service Target Control System (MSTCS) in the 1350 to 1390 Mega Hertz band.
  - Drafted the new International Test and Evaluation Steering Committee Handbook.
  - Drafted the International Test Operations Procedures handbook.
  - Review legislative proposal reciprocal international use of T&E facilities.
  - Evaluated and assessed the potential implementation of the Defense Science Board Recommendations for improvement of test and evaluation and the test and evaluation infrastructure.

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- ATPS:
  - Provided an automated Defense-Wide system to plan, produce and coordinate Test and Evaluation Master Plans (TEMPs) and test plans.
  - Managed and maintained the system to include incorporating MS Project program.
  - Completed conversion to open systems architecture using rational database driven expert system. Beta testing by 193 users.
  - Initiated and completed capability to extract data from documents and Internet.
  - Converted “rules” in the database to comply with new DoD 5000.2R (June 2001) regulations.
  - Incorporated new operational test and evaluation policy in the database “rules”.
- Defense Test and Evaluation Professional Institute (DTEPI):
  - Develops and updates T&E course and training materials for the DoD T&E community to include computer based and WEB based training. Course and training projects included (examples):
    - Developed computer based training course on following proposed topic:
      - Interoperability Test & Evaluation
    - Developed WEB-based Just-in-Time Information on:
      - Environmental Issues For Test and Evaluation
      - Operational Test Agency Modeling and Simulation
      - Central Test and Evaluation Investment Program (CTEIP) Program Executive Guide
- T&E M&S:
  - Provided technical and analytical expertise in support of the DOT&E M&S efforts.
  - Assessed the JMASS 5.0 Beta software.
  - Analyzed and made recommendations on the Accreditation Plan for the Joint Standoff Weapons (JSOW).
  - Supported DOT&E with M&S analyses for the following IPTs: Interoperability, Comanche; and ATIRCM/CMWS;
- Director, Operational Test and Evaluation Enterprise Knowledge Management System (DEKMS):
  - Continue the design and development of a Knowledge Management System, adding robust functionality to enable rapid decision-making on time critical events. The system will be extended to the majority of the DOT&E enterprise and will include Test and Evaluation templates, guidelines and best practices for DOD personnel. This effort will fully support the Department’s goal and vision.
- Official Travel and Administrative Support:
  - Perform official travel in support of the DOT&E oversight of T&E infrastructure.
  - Procure administrative support to carry out oversight of DOT&E programs.
- Accounting and Financial Management Support
  - Provided accounting and financial management support to the Office of the Director.

### **FY 2002 Plans:**

### **T & E Programs:**

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- CCM 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:

### Air Force:

- P-LOCAAS, ABL, JASSM, Enhanced Paveway, JDAM, CV-22, C-17, Litening, Red Team, AGM-65 Maverick

### Army:

- Comanche, Modernized HELLFIRE, Future Scout Vehicle

### Navy/Marines:

- Ship-Based Laser Acquisition System (SBLAS), ERGM, V-22, Laser Weapon System, IEWS/MATES, JSOW

### Foreign:

- Foreign Rangefinder Exploitation Evaluation-G (FREE-G), Night Attack Vision Exploitation (NAVE-G), Foreign GPS, Foreign Laser Beamrider (FLBR) Phase I (code names for classified projects)

### M&S:

- CV-22 Tiltrotor DT/OT, VTUAV, BIRD, DVO tests, JSOW, continue efforts to promote software modifications to warfighting models and simulations to reflect EO/IR CM scenarios at the Joint and Component Service level

### Other:

- TTCP, NATO Panels G-17 and SWG-4, CINC Joint training (Ulchi Focus Lens), and Roving Sands 2001 (RS01)
- Provide CM inputs for evolving programs, identified by the Service Acquisition PEOs/PMs

### CM Warfare Initiative:

- Coordinate CM Warfare Initiative at the CINC and MAJCOM levels

- Direct plans for participation in operational warfighting exercises and simulations

- Brief efforts to establish capability for a Warfighter organization capable of deploying CM in conflict

- Establish EO/IR CM training and equipment requirements and objectives for operational exercises and simulations

- Continue efforts to promote software modifications to warfighting models and simulations to reflect EO/IR countermeasures scenarios at the Joint and Component Service level

- Threat Systems

### Simulators

- Execute the DoD validation program for threat simulators and threat digital models.
- Continue management oversight of 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 modeling programs (e.g., Standard UV Plume Model, IR SAM Flyout Model Upgrade, Integration of RT SAM Models w/DIADS, Advanced Threat Algorithm Analysis, RF SAM Flyout Model Upgrade, Rotary Wing Modulation Software, and Real-Time Infrared Scene generator).
- Continue cooperative technical research and test bed projects to facilitate threat representation (e.g., MATLAB/SIMULINK Air-to-Air Missile Modeling, Laser Beam Rider Missile Fly-out Concept Study, Integration of IFF Functionality into IADS Simulation, and Air-to-Air Miss Missile Distance Correlation).

R-1 Shopping List – Item No 5 - 13 of 18

Exhibit R-2, RDT&E Budget Item Justification

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- Continue to provide the tools to exchange the latest scientific and technological information between test and evaluation and intelligence communities (e.g., Directed Energy & Expendable Countermeasure Test Capability and Directed Energy T&E Systems).
- Update the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community.
- Develop initial test cases to implement the process to effectively utilize threat simulators as true distributed test resources in support of multi-Service interoperability testing in a realistic threat environment.
- Develop initial tool set, methodologies, and operational standards for measures of effectiveness and interoperability testing of the initial test cases.
- Continue to manage a collaborative effort to provide support for interoperability testing in a realistic threat environment.

### Targets

- Continue management oversight of Service threat representative targets.
- Provide OSD seed funds to prototype solution to highest priority deficiencies in current target systems (e.g., Common Avionics Package, Air Superiority Target Study, Infrared Sensor Stimulator Study, and High Energy Laser Study).
- 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., Decoy Countermeasures System, Air Force Subscale Aerial Target (AFSAT), and M&S Acquisition Environment).
- Provide oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
- Develop initial test cases to implement the process to effectively utilize threat representative targets as true distributed test resources in support of multi-Service interoperability testing in a realistic threat environment.
- Develop initial tool set, methodologies, and operational standards for measures of effectiveness and interoperability testing of the initial test cases.
- Continue to manage a collaborative effort to provide support for interoperability testing in a realistic threat environment

### JTCG/AS

- Continue to support the SURVIAC Model Manager and Model Accreditation.
- Complete the MANPADS Threat Characterization project.
- Complete the spacecraft vulnerability analysis.
- Complete the engine damage detection project.
- Complete the passive fire mitigation project.
- Complete the improved air countermeasure with ultra-fine aluminum project.
- Complete the M&S support for acquisition programs project.
- Complete the surface-to-air missile credibility assessment project.
- Complete follow-on modeling requirements for AJEM.
- Complete the WINFIRE/ULLEX project.
- Complete the Methodology to assess helicopter susceptibility to mines project.

R-1 Shopping List – Item No 5 - 14 of 18

Exhibit R-2, RDT&E Budget Item Justification

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- Initiate development of requirements for M&S in T&E.
- Initiate development of integrated survivability assessment process.
- Initiate coordinated management of JMASS survivability M&S.
- Initiate development of improved countermeasures M&S.
- JTCG/ME
  - Develop JMEM data for most critical CINC identified systems. Continue conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponing System (JAWS) v3.0/v3.1, Joint Anti-air Combat Effectiveness – Air Defense (J-ACE: AD) v3.0, Joint Anti-Air Combat Effectiveness - Air Superiority (J-ACE: AS) v3.0, Joint Anti-Air Combat Effectiveness - Ship Anti-air Warfare (J-ACE: Ship AAW) v2.0, JMEM/Surface-to-Surface Weaponing Effectiveness System (JWES) v3.0, and Target Vulnerability Manual v3.x on JAWS). Work to reduce CD-ROM update cycles to a maximum of 14 months.
  - 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 – Revision 4, 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, blast effects, ORCA extension, and target model generation).
  - Reduce major methodology shortcomings. Develop target visualization tool. Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Anti-air effectiveness calculations (i.e., collateral damage, hardened targets, multiple weapon types, real time delivery accuracy/TLE, and dual stage warheads).
  - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., JSEM, 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.
  - Continue CINC data calls in support of FY03 program build requirements.
  - Continue to work on red on blue effectiveness data and methodology.
  - Continue to develop/sanitize JMEM products for foreign customers.

### **T&E Independent Activities**

- Major Range and Test Facility Base (MRTFB) Support:
  - Analyze MRTFB institutional and customer data in support of policy decisions regarding the composition and management of the MRTFBs.
  - Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities.
  - Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments for use in assessing future capability requirements.

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- Analyze MRTFB data and propose issues for the Annual MRTFB Review. Prepare a Summary Report and follow-up to ensure implementation of DOT&E solutions to issues.
- Analyze T&E PPBS information for identification and resolution of potential shortfalls during POM and budget reviews.
- Spectrum Support:
  - Analyze and report on alternative options for telemetry operations in higher frequency bands
  - Develop technical alternatives on issues affecting T&E infrastructure.
  - Provide technical support to Range Spectrum Requirements Working Group on spectrum issues.
- Telemetry Support:
  - Continue to support DOT&E participation in International Consortium for Telemetry Secretary
  - Develop technical approach for Real Time Telemetry Network (RTTN)
  - Perform and conduct special studies on MRTFB radio spectrum issues.
- Special Studies (Examples):
  - Assess the requirements for space range test capability.
  - Expand T&E Assets Identification and Monitoring Process data to include all DoD assets.
- ATPS:
  - Provides an automated Defense-Wide system to plan, produce and coordinate Test and Evaluation Master Plans (TEMPs) and test plans.
  - Management and upkeep of the system to include compliance with new Windows XP operating system.
  - Initiate and complete conversion Web tool to search and exchange data with requirements management programs and database.
  - Develop a built-in configuration management system to permit co-producing TEMPs and Test Plans among multiple individuals.
- DTEPI:
  - Develops and updates T&E course and training materials for the DoD T&E community to include computer based and WEB based training. Following are examples of projects:
    - Develop computer based training course for the following topics:
      - Test and Evaluation
      - A Guide to Targets and their Capabilities
    - Develop WEB-based Just-in-Time Information on:
      - Communication Theory Basics and Testing
      - Software Test and Evaluation
- T&E M&S
  - Provide technical and analytical expertise in support of DOT&E M&S efforts.
  - Initiate support of the Test Simulation Program, which will provide tools for better test planning and post test analysis.
  - Review and analyze technical M&S software for use in DOT&E testing environment.
  - Provide M&S assessments on key programs such as: Joint Modeling and Simulation System (JMASS), Joint Analytical Model and Instrumentation Program (JAMIP), Joint Distribution & Engineering Plan (JDEP) and Joint Warfare System (JWARS).
  - Prepare final report on the study of military technology trends, and their impact on future M&S requirement, in support of T&E.

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- Director, Operational Test and Evaluation Enterprise Knowledge Management System (DEKMS):
  - Continue the design and development of a Knowledge Management System, adding robust functionality to enable rapid decision-making on time critical events. The system will be extended to the majority of the DOT&E enterprise and will include Test and Evaluation templates, guidelines and best practices for DOD personnel. This effort will fully support the Department's goal and vision.
- Official Travel and Administrative Support:
  - Perform official travel in support of the DOT&E oversight of T&E infrastructure.
  - Procure administrative support to carry out oversight of DOT&E programs.
- Accounting and Financial Management Support
  - Provided accounting and financial management support to the Office of the Director.

**B. (U) PROGRAM CHANGE SUMMARY**

(\$ in Millions)	<u>FY 2000</u> <sup>1</sup>	<u>FY 2001</u> <sup>2</sup>	<u>FY 2002</u>
FY 2001 President's Budget	99.840	53.275	53.273
Section 8086 Reduction		(.373)	
P.L. 106-554 Reduction		(.116)	
Appropriated Value	99.840	52.902	
Adjustments to Appropriated Value			
Transfer to Military Court of Appeals			(.026)
JMEM Update (PDM I Adjustment)			5.100
Nonpay Inflation Adjustment			1.100
Current Budget Submit	0.000	52.786	59.447

**Notes:**

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C. (U) OTHER PROGRAM FUNDING SUMMARY: NA

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