OFFICE OF THE SECRETARY OF DEFENSE

DIRECTOR, OPERATIONAL TEST AND EVALUATION

APPROPRIATION: OPERATIONAL TEST AND EVALUATION, DEFENSE (0460)

Index of Charts and Exhibits

Exhibit R-1, RDT&E Programs

Department of Defense

OPERATIONAL TEST AND EVALUATION, DEFENSE APPROPRIATION (0460)

Date:
February 2004

R-1 Line Item No	Program Element Number	Item	Budget Activity	FY 2003 Cost	FY 2004 Cost	FY 2005 Cost
1	0603941D8Z [U]	Test & Evaluation Science & Technology	3	8.571	12.804	16.295
	Advanced Technology Development			**8.571**	**12.804**	**16.295**
2	0604940D8Z [U]	Central Test and Evaluation Investment	6	124.319	136.168	123.562
3	0605118D8Z [U]	Operational Test and Evaluation	6	27.472	37.006	42.390
4	0605131D8Z [U]	Live Fire Testing	6	15.791	11.721	10.209
5	0605804D8Z [U]	Development Test and Evaluation	6	63.426	104.381	112.679
	RDT&E Management Support			**231.008**	**289.276**	**288.840**
Total	**Operational Test & Evaluation, Defense**			**239.579**	**302.080**	**305.135**

RDT&E PROJECT JUSTIFICATION SHEET (R-2)				February 2004			
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE				TEST AND EVALUATION/SCIENCE AND TECHNOLOGY (T&E/S&T) PROGRAM ELEMENT (PE) 0603941D8Z			
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PE 0603941D	8.571	12.804	16.295	28.871	43.318	65.301	97.669
Hypersonic Test	2.305	2.211	3.168	6.053	10.467	16.028	26.812
Spectrum Efficient Technology	2.199	2.149	2.417	3.953	4.339	5.415	6.329
Multi-Spectral Test	1.498	2.079	2.620	3.171	5.190	8.248	12.728
Embedded Instrumentation	1.417	3.309	2.663	3.982	4.983	7.949	11.743
Directed Energy Test	1.152	3.006	4.327	5.887	9.763	14.967	24.808
Information Systems Technology Test	0.000	0.050	1.100	1.968	2.247	3.447	4.077
Software Test	0.000	0.000	0.000	1.857	2.338	3.380	4.156
Modeling and Simulation	0.000	0.000	0.000	1.000	1.922	2.967	3.480
Test Range/Facility Technology Improvements	0.000	0.000	0.000	1.000	2.069	2.900	3.536

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The T&E/S&T program seeks out and develops test technologies to pace evolving weapons technology. This program is critical to ensuring the DoD has the capability to adequately test the advanced systems that will be fielded in the future. To meet this objective, the T&E/S&T program:

- Exploits new technologies and processes to meet important T&E requirements
- Expedites the transition of new technologies from the laboratory environment to the T&E community
- Leverages commercial equipment and networking innovations to support T&E

Additionally, the program examines emerging test requirements derived from transformation initiatives to identify needed technology areas and develop a long-range roadmap for technology insertion. This program leverages and employs applicable 6.2 applied research from the highly developed technology base in the DoD Laboratories and Test Centers, industry, and academia to accelerate the development of new test capabilities.

Official Travel:

Perform official travel to carry out oversight of the T&E/S&T program.

This Research Category 6.3, Advanced Technology Development PE, develops and demonstrates high payoff technologies for current and future DoD test capabilities.

B. (U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2003	FY 2004	FY 2005
FY 2004 President's Budget	8.571	12.804	19.413
Current Budget Submit	8.571	12.804	16.295
Total Adjustments			(3.118)
Congressional Program Reductions			
Congressional Rescissions			
Congressional Increases			
Program Adjustment			(3.000)
Inflation Adjustment			(0.118)

C. (U) OTHER PROGRAM FUNDING NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)			February 2004				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D			HYPERSONIC TEST				
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Hypersonic Test	2.305	2.211	3.168	6.053	10.467	16.028	26.812

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The National Aerospace Initiative (NAI) will develop air-breathing weapons, advanced aircraft, and access to space platforms to operate in the hypersonic speed regimes Mach 5 and higher. Hypersonic systems to be developed under the NAI require T&E capabilities in numerous areas ranging from ground testing (wind tunnels, sled tracks, installed-system test facilities, and modeling and simulation (including computational fluid dynamics)), through flight testing (entailing large geographical areas and huge safety footprints) that exceed current test capabilities. At hypersonic speeds, flight testing will also challenge existing ground instrumentation systems (e.g., tracking system slew rate limitations, ionization dropouts) and range safety decision making. Near-term hypersonic applications are focused on developing technologies for munitions and weapons for time critical and mobile targets, advanced global reach aircraft, and access to space platforms that will operate in the hypersonic speed regimes; i.e., Mach 5 to Mach 16. Hypersonic weapon systems will depend on several new technological thrusts in areas such as propulsion and engines, structures and materials, guidance and control, seekers and sensors, warheads and payloads, and weapons delivery techniques and end-game dynamics, each requiring supporting T&E capabilities to determine performance, effectiveness, suitability, survivability, and responsiveness to Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) systems. Service improvement and modernization programs are addressing some basic test facility upgrades using off-the-shelf technologies. However, T&E of hypersonic systems will require technologies not yet developed or available for T&E purposes. The NAI and DoD must have adequate T&E capabilities in place in time to meet current development and acquisition program schedules. The purpose of this T&E/S&T focus area is to address these T&E technology issues.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Hypersonic Test	2.305	2.211	3.168

FY 2003 Accomplishments:

Investigations initiated in Hypersonic Test in FY 2002 continued throughout FY 2003. The Hypersonic Wind Tunnel Nozzle Survivability for T&E effort characterized and evaluated alloys and coatings that show promise for high-temperature survivable nozzles required for hypersonic testing, and examined nozzle cooling techniques. The In-Situ Pressure Measurements for Hypersonic Vehicles designed and began fabrication of a proof-of-concept Microelectromechanical Systems (MEMS) pressure sensor on a silicon-carbide chip to allow for measurement of pressures within hypersonic systems.

The Heat Flux Sensor Development for Hypersonic Aerothermal Measurement project fabricated prototype sensors and performed target of opportunity tests that included tests to support the Space Shuttle return to flight efforts. The Advanced Flight Vehicle Instrumentation effort conducted a series of proof-of-concept experiments that demonstrated optical sensor performance for combustor testing. These new sensors detected an unknown combustor ignition phenomenon that will be analyzed as part of the NAI.

Progress continued on the Hypersonic Aeropropulsion System Flight Trajectory T&E, which is developing a capability to emulate a hypersonic "fly-the-mission" profile by varying the Mach number in the wind tunnel. T&E requirements for time-dependent Mach variation were assessed, and a technique was selected to achieve acceleration flight trajectory testing. The project also developed the isobutane burner technology needed to provide the required Mach number variation capabilities. This burner technology is being considered to improve flight condition simulation at Arnold Engineering Development Center.

Two new efforts were initiated: Onboard Data Acquisition for Hypersonic Combustion Research, which will develop a survivable data acquisition system with soft-recovery capability for hypersonic flight tests, and the Hypersonic Clean Air Heater Test Technology, which will develop ceramic resistance-type heater technology to provide clean air for hypersonic testing to Mach 7.

FY 2004 Plans:

Investigations initiated in FY 2002 and FY 2003 will continue. Specific developments and demonstrations planned for these projects are:

- Hypersonic Wind Tunnel Nozzle Survivability for T&E will fabricate nozzle throats using newly developed alloys and evaluate these throats in an existing ultra-high pressure blow-down facility (Magnetohydrodynamics Accelerator Research into Advanced Hypersonics (MARIAH) concept facility). The initial demonstration will occur this year followed by the planned transition to multiple facilities.
- In-Situ Pressure Measurements for Hypersonic Vehicles will fabricate MEMS pressure sensing devices with on-chip amplification and temperature compensation and then conduct tests with these sensors to observe their performance. The testing using combustor materials from a hypersonic vehicle will complete in FY 2004.

- Heat Flux Sensor Development for Aerothermal Measurements will generate calibrated heat flux sensors and test these sensors at high heat flux levels. Efforts will also develop microminiature assemblies to support wind tunnel testing. Testing and refinement of prototype sensors will continue through this year.
- Advanced Flight Vehicle Instrumentation will complete reporting on optical sensor integration and designs for distributed onboard optical data systems. These designs will be transitioned to the DARPA HyFly program.
- Hypersonic Aeropropulsion System Flight Trajectory T&E will continue to develop technology required for a variable Mach number generation system. This effort is developing a method to alter the geometry of supersonic freejet nozzles by rotating the air heater with respect to the article under test.
- Hypersonic Clean Air Heater Test Technology will complete design studies, pilot heater development, and materials property testing initiated in FY 2003.
- Onboard Data Acquisition for Hypersonic Combustion Research will conduct proof-of-principle tests, ballistic vehicle nose tests, and flow-through model tests to demonstrate the ability of an onboard data acquisition system to survive under hypersonic conditions.

The Hypersonic Wind Tunnel Nozzle Survivability for T&E, In-Situ Pressure Measurements for Hypersonic Vehicles and Advanced Flight Vehicle Instrumentation projects are all scheduled for completion in FY 2004. New efforts on high-speed sled mounted nozzles and advanced heater development concepts will be initiated. An investigation to improve predictions of flight vehicle propulsion performance based on vitiated air (air contaminated by heating) data from ground test facilities will also be initiated. A Broad Agency Announcement will be issued to identify candidate efforts for FY 2005.

FY 2005 and Future Plans:

Projects identified by the FY 2004 Broad Agency Announcement process will be initiated. Future investigations will be launched to address T&E technology challenges in this focus area including:

- Flight testing:
  - Providing continuous and survivable (at least through the test mission) telemetry, time-space position and attitude information, and command/control (including flight termination systems) through target engagement
  - Providing data for evaluation of performance, effectiveness, suitability, survivability, and recovery
  - Providing inter-range operations, ground instrumentation (tracking, data stream reception), and range safety and non-destructive flight termination capabilities
  - Weapons separation and end-game dynamics
  - High velocity flight control

- Ground testing:
  - Realistic ground test environments (wind tunnel, computational fluid dynamics (CFD), magnetohydrodynamics, installed-system test facility, sled track, propulsion test stands) and capabilities to adequately simulate flight conditions with associated targets and countermeasures conditions
  - Onboard survivable sensors and instrumentation systems
  - Aerodynamic aerothermal heating and cooling
  - Structures and materials effects.

C. (U) OTHER PROGRAM FUNDING NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)	February 2004
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D	SPECTRUM EFFICIENT TECHNOLOGY

$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Spectrum Efficient Technology	2.199	2.149	2.417	3.953	4.339	5.415	6.329

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Increasing commercial use of the radio frequency (RF) spectrum and DoD's higher demands for bandwidth and test data are impacting the capability to test current weapon systems. Realistic testing of modern military systems, and follow-on training at the completion of a defense system's development phase, rely heavily on the use of the RF spectrum, especially in the "L" and "S" microwave bands. Signal propagation, supportable data rates, and other related characteristics make these bands ideally suited for test telemetry and training applications. However, these are the same characteristics that make these bands highly coveted by the wireless communications industry. The growth in the demand for consumer communication services has resulted in an increasing reallocation of RF spectrum from government to non-government use. The reallocation of this spectrum, coupled with the increase in activities that use it, has raised concerns regarding the availability of adequate spectrum to support test and training. Current and future major flight test programs such as the F-22, Joint Strike Fighter, Future Combat Systems, Airborne Laser, and the Ballistic Missile Defense System (BMDS) will experience increased competition for spectrum. Compromises will be required, and some programs may have to reduce the number of tests and/or modify schedules unless technological advances are achieved in the spectrum efficiency focus area. New technology development is required to increase the efficiency of the remaining spectrum allocations, and to begin investigations into possible use of unused or lesser-used parts of the spectrum.

Each new generation of military systems typically generates ten times more data and information than the system it is replacing, resulting in a 20-year trend of exceptional growth in the demand for test and training related spectrum. The next generation of systems will generate proportionately greater data rates that will exceed the capability of our current test infrastructure. This T&E/S&T focus area will develop and adapt S&T from a wide range of sources to facilitate continued test and training operations in the remaining or less-used portions of the RF spectrum, and at higher data rates.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Spectrum Efficient Technology	2.199	2.149	2.417

FY 2003 Accomplishments:

Two FY 2002 investigation efforts, the M-ary Variable Shift Keying and Variable Phase Shift Keying/Feher Variant High Efficiency Modulations, were completed in FY 2003. These investigations analyzed several proposed high efficiency modulation schemes to improve range communications which led to a follow-on analysis of a new modulation scheme that has potential to increase communications efficiency by a factor of three.

The Ground Antenna Study investigated ground-based receiving telemetry antennas and identified a series of feasible modifications to allow operation of existing assets in the Super High Frequency (SHF) bands and potentially allow operation simultaneously with other telemetry bands. The Spectrally Efficient High Data Rate Telemetry System for SHF simulation efforts demonstrated the ability to combine Advanced Orthogonal Frequency Division Multiplexing (AOFDM) techniques with Turbo Cross-Channel Coding (TCCC) to achieve high data rates and overcome Doppler and multipath issues. The AOFDM prototype fabrication was initiated this year to validate the predictions.

Phase I of the Steerable Beam, Directional Antenna Concepts was completed to minimize effects of communication nulls in the SHF bands. The Phase II prototype and demonstration effort began this year. The Space-Time Coding effort continued investigation into various channel estimation techniques to reduce the loss of data from signal fading. The project completed development of a breadboard encoder device that will be used for proof-of-concept flight test. This effort also initiated investigations into a differential space-time coding technique that is compatible with existing modulation waveforms.

The SHF Channel Modeling and Implementation project completed an analytical study on the multipath effects in SHF bands. This project also initiated experimentation efforts for flight test to verify analytical results. The SHF Propagation Study identified a series of attenuation issues within the SHF bands and identified potential SHF bands where telemetry communications are possible. These results will support the T&E community during the 2007 World Radio Conference.

The Radio Frequency (RF) Microelectromechanical Systems (MEMS) Antenna project successfully demonstrated, through analysis and simulation, an RF MEMS antenna concept in preparation for antenna hardware fabrication. This technology will support a software-defined antenna that could be applied to steerable gain antennas to increase telemetry link performance margins. The Phased Array Antenna project is developing adaptive coherent combining feed technology and neural network algorithms to provide improved accuracy pointing for the ground antennas used for telemetry systems. In FY 2003, this effort developed a preliminary version of adaptive algorithms that do not require knowledge of the antenna pointing direction and can allow an antenna to be used for reception of multiple telemetry signals.

FY 2004 Plans:

The Spectrum Efficient Technology focus area will mature prior years' efforts and identify new efforts to begin in FY 2005. Flight demonstrations will be initiated to conduct prototype demonstration and model validation based on prior year project results. Additional efforts into optical communications and other communication standards will be initiated. Specific plans for Spectrum Efficiency focus area projects are:

- Spectrally Efficient High Data Rate Telemetry System for SHF will continue to address unique T&E environmental conditions such as multi-path and high test vehicle speeds. The AOFDM prototype fabrication with high mobility synchronization will be completed and demonstrated in flight test.
- Steerable Beam, Directional Antenna Concepts will complete design and development of a prototype steerable beam antenna system and perform ground tests to characterize performance in preparation for flight test.
- RF MEMS Antenna will determine parasitic interactions between pixel elements used to form antennas and design a feed/antenna configuration for optimal performance using RF MEMS. The Phase II effort to build an integrated RF MEMS antenna brassboard demonstrator will be initiated.
- Phased Array Antenna will continue to develop autonomous neural network and low complexity antenna pointing algorithms that improve the pointing accuracy and pointing speed of ground antennas utilized for test and evaluation. This effort will develop diversity combining algorithms that work on multiple receiving elements to provide significant signal to noise ratio gains in fast and frequency selective fading environments via real-time adaptive algorithms.
- Spectrum Efficient Range Communications will determine applicability of specific technologies to achieve spectrally efficient test and training range communications

FY 2005 and Future Plans:

Additional investigations will be initiated as a result of the Program Research & Development Announcement process to address critical T&E technology issues such as:

- Deconfliction of RF spectrum usage for T&E in Joint Urban Operations (JUO)
- Smart (adaptive) antenna arrays for unobtrusive and non-interfering operations for system-under-test, and variable beamwidth directional antennas for frequency sharing
- Techniques for overcoming transmission losses during ionization periods of hypersonic systems testing
- More efficient and reliable portions of the RF spectrum for future telemetry, command and control, and datalink communications for T&E and training
- Ultra-high data rate pre-processing, compression, storage, and bandwidth- efficient modulation schemes for transmission
- Remotely tunable datalink transceivers for security, safety, and inter-range operations
- Doppler shift compensation for coherent receivers

C. (U) OTHER PROGRAM FUNDING NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)	February 2004
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D	MULTI-SPECTRAL TEST

$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Multi-Spectral Test	1.498	2.079	2.620	3.171	5.190	8.248	12.728

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

DoD S&T programs are developing new technologies for use in multi- and hyper-spectral sensors, seekers, detectors, and target designators for weapon systems and battle damage assessments. T&E of new multi- and hyper-spectral sensors to be used in these future weapon systems will require new T&E technologies. T&E investment programs, such as the Central Test and Evaluation Investment Program (CTEIP) and Service improvement and modernization programs, are addressing some basic multi-spectral requirements using off-the-shelf technologies. However, T&E of future multi- and hyper-spectral systems will require technologies and procedures not yet developed or available for T&E purposes. Without these new T&E technologies, DoD will not be able to adequately test and evaluate the multi- and hyper-spectral weapon systems of the future.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Multi-Spectral Test	1.498	2.079	2.620

FY 2003 Accomplishments:

The Multi-Spectral Test focus area advanced the efforts that were initiated in FY 2002 through proof-of-concept and breadboard demonstrations. One new effort was initiated.

Development of the Dynamic Hyper-spectral Thermal Signature Model continued. This model will provide a method to generate high fidelity vehicle and background hyper-spectral scenes to include interactions between vehicle and terrain, vegetation, and cultural objects (plume, dust, smoke, tracks, shadows, etc.). This project successfully accomplished a proof-of-concept demonstration that generated a hyper-spectral scene from synthetically generated data.

The Phase I investigation and proof-of-concept demonstration of the adaptive Multi-spectral Stimulator Injection Test Method was successfully completed. This effort demonstrated the ability to use a common scene with a radio frequency (RF) and infrared (IR) stimulator to create a simultaneous multi-spectral scene for injection into hardware and software under test.

The Hyper-spectral Testbed Design project demonstrated the ability to integrate a hyper-spectral scene generator and sensor. The proof-of-concept testbed integrated a thermal pixel array with a reverse spectrometer and successfully injected a scene into a sensor.

The Hyper-spectral Sensor Evaluation – Minimum Resolvable Temperature (MRT) effort was initiated to determine methods for analyzing the performance of under-sampled imagers (e.g. new Focal Plane Arrays (FPAs)) to replace the current MRT test procedures, which were adequate for sensors in the past, but are inadequate for T&E of FPAs.

FY 2004 Plans:

The T&E/S&T program Multi-Spectral Test focus area will mature prior years' efforts and identify new efforts to begin in FY 2005. Specific plans for the multi-spectral test projects are:

- Dynamic Hyper-spectral Thermal Signature Model will continue the development of an open-source high-fidelity multi- and hyper-spectral vehicle/background signature model (visible through IR). Effort will continue to add operational level detail to the signature model: additional vehicle models, two-way background interactions, 3-dimensional terrain, vegetation, and cultural objects.
- Multi-spectral Stimulator Injection Test Method will continue development of a multi-spectral stimulator to provide T&E support for multi-mode seekers in the laboratory and field environments. This year's plans include demonstration of closed-loop stimulation for T&E of trackers, automatic target recognition systems, terrain and clutter analysis, and evaluation of sensor fusion.
- Hyper-spectral Testbed Design will continue development of the Long Wave Infrared (LWIR) Hyper-spectral Scene Projector by demonstrating the integration of the LWIR Acoustic Optical Thermal Filter into the current test bed, and validating testbed operation with additional sensors. A Phase II prototype Hyper-spectral Scene Projector with the desired temperature range capability will be designed.
- Hyper-spectral Sensor Evaluation – Minimum Resolvable Temperature will continue research of potential methods for measuring the performance of focal plane arrays (lab tests, field performance validation, theoretical models). FY 2004 efforts include experimentation with lab measurements and sensor parameters combined for an accurate field-relatable metric to determine performance of focal plane arrays.

FY 2005 and Future Plans:

Complete all four of the ongoing FY 2004 efforts and to initiate new investigations into visible and near-IR multi-spectral and hyper-spectral sensor testbeds, real time hyper-spectral data processing and analysis, and Bi-directional Reflectance Distribution Function. Additional investigations will be initiated to address other multi-spectral and hyper-spectral sensor test technology issues such as:

- Hyper-spectral visible/near-IR scene generation model integration
- Common usage, tunable, full spectrum, and high-resolution scene generators

- Common usage, threat representative, full spectrum, and high-resolution dynamic targets
- Countermeasure environments, countermeasure applications, and closed loop counter-countermeasure capabilities
- Improved models for all-weather scenario drivers and target presentations
- Ladar, and other multi-spectral test generator and standoff sensors
- Joint Urban Operations scenarios
- Sensor-to-shooter system and sensor-to-fusion-to-shooter system performance
- Far-field signal simulations in near-field
- Unobtrusive sensor integration and fusion monitoring
- Hardware-in-the-loop and installed-system test facility capabilities
- Human-in-the-loop and associated Human Systems Interface (HSI) issues
- Focal plane array (FPA) technologies, frequency-hopping sensors, multi-spectral/hyper-spectral imaging, active illumination, passive polarization, passive millimeter wave, foliage penetration, synthetic-aperture radar, and electronic stabilization
- Fusion of multiple advanced sensor components, the application of the aided target recognition algorithms to these advanced sensors
- Positive identification of non-cooperative air targets, over-the-horizon targeting, and battle damage assessment
- Tools to evaluate hyper-spectral-polarimetric sensors
- Tools and techniques to evaluate active multi-spectral sensor systems
- T&E of signal processing hyper-spectral algorithm effectiveness
- Sensor-to-shooter system interface analysis (human-in-the-loop testing)
- Hyper-spectral analysis tool for handling and collating T&E data
- Methodologies for evaluating sensor-to-sensor transition (e.g. acoustic/IR, Millimeter Wave (MMW)/IR systems)

C. (U) <u>OTHER PROGRAM FUNDING</u> NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)	February 2004
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D	EMBEDDED INSTRUMENTATION

$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Embedded Instrumentation	1.417	3.309	2.663	3.982	4.983	7.949	11.743

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Instrumentation requirements for systems-under-test, hardware-in-the-loop testing, and training are increasing exponentially for new weapons; command, control, communications, and computers, intelligence, surveillance, and reconnaissance (C4ISR), and target systems. Onboard or personnel-borne instrumentation and equipment is required for sensing and collecting critical performance data; data storage and transmission; determining accurate time, space, position, and attitude information; interfacing with command and control data links; monitoring and reporting system-wide communications; and reporting human operator performance. These requirements drive the need for enabling technologies for miniaturized non-intrusive instrumentation suites that demonstrate increased survivability. These lightweight instrumentation suites need to have improved sensitivity sensors, increased embedded data processing capacity, and both plug-and-play and open architectures to support multiple applications and users (development, test and evaluation, training, logistics (intelligent diagnostics/prognostics) and employment effects).

There is minimal space available for adding instrumentation to new weapon systems subsequent to their development. Additional weight and power draw can adversely affect the weapon system performance. Providing space and power in small weapons, such as miniature-unmanned vehicles and robotics, and targets remains a challenge. Instrumentation for humans-in-the-loop, such as a dismounted soldier in an urban environment, should not detrimentally affect the soldier's performance or impact his operational burden. New technologies can be exploited to integrate small non-intrusive embedded instrumentation (EI) into new platforms during design and development, and, in some cases, for incorporation into existing platforms. This embedded instrumentation can provide the required data for T&E training, maintenance, and logistics support throughout the system lifecycle and will enhance the ability to document system performance during combat missions. As recognized by Business Initiative Council (BIC) Initiative TE-08, embedded instrumentation for T&E, training, maintenance, and logistics will significantly reduce the development, acquisition, and total ownership costs of new weapon and C4ISR systems while enhancing force readiness. Accordingly, acquisition programs are to integrate EI into platform designs up front, if reasonable and practical, as a key enabling tool for transformation.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Embedded Instrumentation	1.417	3.309	2.663

FY 2003 Accomplishments:

The Embedded Instrumentation focus area sponsored several projects in FY 2003 to investigate technologies needed by the T&E community.

The Direct Methanol Fuel Cell (DMFC) project is developing an advanced power supply to support operational testing of ground-based weapon systems, such as Future Combat Systems. Key components of the fuel cell assembly were manufactured in preparation for a prototype demonstration.

The Carbon Monoxide (CO) Emissions Sensor for Gas Turbine Engines project initiated the development of MicroElectroMechanical Systems (MEMS) based sensors to support the T&E of combustion engines. This sensor will be embedded near the harsh combustor region of air-breathing engines, such as those used for hypersonic aircraft, to directly measure carbon monoxide emissions. This data is a key indicator of engine performance.

The Compact Holographic Data Storage project is developing a compact, high-speed, high density (>500 GB) embedded data storage device that has no moving parts. The holographic data storage effort demonstrated the ability to read and write data to a crystal and completed development of a breadboard design.

The Advanced Munitions Flight Test Instrumentation project is developing MEMS based sensors to couple with a munitions telemetry device to allow acquisition and transmission of critical test data during munitions testing. This effort performed a series of shock tests to qualify MEMS devices under munitions shock loads for potential incorporation into the prototype instrumentation package.

The EI Working Group used the Broad Agency Announcement process to select efforts for FY 2004 investigation.

FY 2004 Plans:

The Direct Methanol Fuel Cell project will be completed during FY 2004 with a field demonstration of the system at Fort Hood, TX. The remaining efforts described above will continue through FY 2004. Specific plans are:

- The CO Emissions Sensor will fabricate a MEMS CO system and begin a series of demonstrations and tests.
- The Compact Holographic Data Storage will begin the Phase II development of an integrated optics, laser source, and input/output controller in a stand-alone brassboard demonstration system. The Advanced Munitions Flight Test Instrumentation project will integrate a single chip, 3-axis accelerometer into a packaged configuration, and design and fabricate a 2-axis Vibrating Bar Magnetometer for incorporation into a prototype module.
- The following efforts will initiate in FY 2004:
  - The Gas Turbine Engine Embedded Probe project will design and fabricate a gas extraction probe capable of being embedded

within a combustor for use with emissions sensors. The FY 2004 efforts include design and fabrication of a proof-of-concept probe.

- The Wideband Energy Harvesting for Embedded Sensors effort will design, fabricate, and demonstrate a prototype piezoelectric energy harvester to provide power to stand-alone MEMS sensors.
- The D-fiber for Multidimensional Sensor Application will use D-fiber to develop multi-axis stress and temperature sensors. The FY 2004 effort will fabricate suitable gratings on D-fiber, embed fibers on a proof-of-concept test article, and demonstrate multi-axis stress and temperature sensing.
- The Micro-machined Pressure, Temperature, and Shear Stress Sensors project will embed MEMS sensors directly in optical fiber. The FY 2004 efforts will design and fabricate individual pressure, temperature, and shear stress sensors, and embed them on a test article for demonstration.
- Additional planned efforts for FY 2004 include investigation of a Soldier EI system and an embeddable MEMS-based emissions gas analyzer.

FY 2005 and Future Plans:

The FY 2003 projects will complete in FY 2005/2006 with prototype demonstrations. Efforts will advance on the projects initiated in FY 2004 as well. The EI Working Group will examine EI test technology issues to determine the highest priorities for funding future projects. Some projects may begin in FY 2005; however, the EI Working Group will issue a Broad Agency Announcement to select the larger efforts for FY 2006 investigation. These efforts will focus on additional EI test technology issues such as:

- Miniaturization and reduced-weight instrumentation packaging
- Improved sensor techniques
- Higher bandwidth data encryption
- Human performance instrumentation (e.g., Joint Urban Operations T&E)
- Non-intrusive interfaces with critical operational components including the MIL-STD-1553 data bus
- Conformal and non-interfering antennas
- Survivability in harsh environments, such as hypersonic speeds or electronic warfare
- Wireless data and communications transfers and distribution
- Plug and play architecture for common usage
- Reductions in on-board power demands
- Instrumentation command and control
- Data fusion
- Vehicle power lines as a data bus
- Conformal externally mounted instrumentation
- Electro-adhesives

- Small RF transceivers
- Ultra tightly coupled, integrated M-code Global Positioning System/Inertial Measurement Unit modules for high dynamic vehicles
- High anti-jam signal processing techniques for operations in an electronic warfare and jamming environment
- Smaller, higher capacity recorders to support passive operation
- More powerful micro-processors to support advanced simulations
- Compact and stable timing reference units
- Passive devices for improving ground truth measurements, such as for attitude and miss-distance measurements.

C. (U) OTHER PROGRAM FUNDING NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)			February 2004				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D			DIRECTED ENERGY TEST				
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Directed Energy Test	1.152	3.006	4.327	5.887	9.763	14.967	24.808

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Directed energy (DE) technologies are rapidly transitioning into acquisition programs and Advanced Concept Technology Demonstrations (ACTDs). These weapons technologies, which primarily consist of High Energy Laser (HEL) and High Power Microwaves (HPM), are outpacing their supporting test technologies. Advancements in HEL and HPM have created a new class of weapon systems in which energy is placed on a target instantaneously, making traditional test techniques for evaluating conventional munitions (with flight times ranging from seconds to minutes, and that depend on various forms of physical contact for kill) not applicable to DE systems' T&E. As a result, adequate developmental, live fire, and operational test technology may not be available when the DE acquisition programs are ready to test.

Current DE developments include: HPM command and control warfare/information warfare, Active Denial Systems, Advanced Tactical Laser, Air Force Airborne Laser, Army Tactical High Energy Laser, Army Mobile Tactical High Energy Laser, Navy Free Electron Laser, Solid State Laser, and Space Based Laser. These DE systems will precipitate a revolutionary change on future engagements, employments, concepts of operations, and T&E. Lasers can be precisely focused on a target to provide surgical strike capability at very long ranges. Once on target, lasers affect the target from the outside by rapid heating, causing localized burn-through to create structural degradation or destruction and observable attributes of a hard kill. Conversely, high-power microwaves flood target areas with energy—allowing for the engagement of multiple targets at the same time. High power microwaves affect the target from the inside through electrical system disruption and burn-out for a soft kill. These differences notwithstanding, both HEL and HPM have some very important common traits. Both types of directed energy travel to the target at the speed of light, are capable of graduated effects (deny, disrupt, degrade, and/or destroy), and can be used to minimize collateral damage. These revolutionary operational capabilities will require revolutionary T&E scenarios, technologies, and analysis tools that do not exist today.

Current DE system and component testing usually includes two principal thrusts: how well is the weapon performing, and what is the specific interaction of energy and target. Military utility of these weapons will be dependent on the knowledge acquired through T&E to know how much

to trust the technologies under development and how best to use them. Consequences of not providing adequate T&E capabilities for the new DE technologies and systems include:

- Not knowing if the system can be safely deployed
- Not knowing if the system achieves the proper target kill rate
- Risk of apparent poor system performance during T&E leading to unjustified program cancellation
- Risk of fielding an ineffective system due to inadequate T&E
- Delays in meeting critical Transformation Objectives

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Directed Energy Test	1.152	3.006	4.327

FY 2003 Accomplishments:

Three efforts were initiated in the DE Test focus area in FY 2003.

The first effort was the development of a Beam Redistribution System (BRS) to allow far-field laser effects to be created in a near-field environment using a portable optical system. This will allow characterization of the beam without requiring the long ranges necessary to achieve these effects. In FY 2003, two parallel approaches to develop conceptual designs were completed. One approach was downselected for Phase II award, which will begin in FY 2004.

The second effort was to develop a Four-Color Quantum Well Infrared Photodetector (QWIP). The QWIP will allow for remote sensing and characterization of a multiple laser wavelength system as it interacts with a target. In FY 2003, the QWIP project advanced the system design, completing efforts for Near IR reflective optics and computer generated diffractive optical grating.

The final effort initiated in FY 2003 was the Directed Energy Data Acquisition Transformation (DEDAT) project. DEDAT is developing instrumentation solutions to allow for T&E of HPM systems. In FY 2003, DEDAT initiated design studies for E-field probes, digitizers, and electromagnetically-hardened instrumentation.

FY 2004 Plans:

The three existing DE Test projects will continue development through FY 2004. The BRS system will complete the Phase II demonstration in FY 2004. The QWIP will complete design, and begin fabrication, integration, and test of system components. DEDAT will prototype a compact remote digitizer and electromagnetically-hardened sensor electronics. New efforts will begin in the development of a system to characterize optical turbulence along the beam path for laser system T&E; laser beam characterization through the use of instrumented target boards and on-target beam sensors; and development of survivable, autonomous HPM field diagnostics.

FY 2005 and Future Plans:

The QWIP and DEDAT will complete in FY 2005 with system prototype demonstrations. Efforts will advance on the projects initiated in FY 2004 as well. Future investigations will focus on key technologies to support collection of data both remotely and on-target for HEL and HPM testing. This includes, but is not limited to, data associated with imaging, spectral content, laser-target interaction signature, "kill" mechanisms, atmospheric refraction, scattering, absorption and propagation data, beam quality, jitter, energy fluence on target, aim point maintenance, data recording, spectrally efficient data links, high-rate image/data reduction and visualization tools, etc. Investigations will include:

- HEL and HPM power measurement on target: Examine various sensor approaches or materials that can be incorporated into airborne and ground targets to measure DE on target. Sensors/material must be able to be applied/integrated into a variety of platforms, to include airborne and ground-based, and provide for minimal interference with system operation to provide a measure of beam energy on target. Inability to collect DE on target will preclude ability to measure effectiveness of emerging DE weapon systems.
- DE-hardened flight termination system/range destruct package: Study and assess requirements for DE "hardened" flight termination systems. These systems must be able to safely and reliably provide for termination of the target, even when high concentrations of DE are present on the target. This should include both HEL and HPM. Current flight termination systems may either be negated or pre-maturely initiated by the presence of RF energy or high-fluence laser energy. Impact of flight termination system failure due to DE could include damage to unintended targets, unrecoverable targets, and threat to life and areas surrounding the test area.
- DE beam prediction/detection/display: Develop capability to accurately predict and understand where HEL and HPM energy is actually projected—this is critical to T&E and safety. Study of wide-spectrum, single substrate imagers seeks to enhance technology for imaging and detection of HEL beams from a variety of systems/sources. These enhancements would address limitations in spectral coverage of various narrow spectrum, single substrate imagers. Current technology requires multiple sensor/optic combinations to cover the spectral range of existing HELs, which is cost prohibitive. Single wide-spectrum imagers would eliminate the need for multiple, costly sensor/optics combinations.
- Modeling and simulation (M&S) to extend test results: Incorporate physics-based models into virtual graphical representations of T&E ranges to provide 3-dimensional, geodetically accurate models of beam propagation, beam spread, lethal range, fluence on target, and atmospheric effects. These models could be used to predict hazardous DE fluence and beam propagation for a given test scenario, plan and model RF or HEL fluence in a test or target area to rehearse test conduct, and provide for a robust DE 3-dimensional visualization capability for T&E ranges. Current 3-dimensional models are based on digital terrain data and can incorporate time-space position information from various sources such as radar and GPS, but lack physics-based models to predict laser or RF weapon system performance.

C. (U) OTHER PROGRAM FUNDING NA

RDT&E PROJECT JUSTIFICATION SHEET (R-2a)	February 2004
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE, PE 0603941D	INFORMATION SYSTEMS TECHNOLOGY TEST

$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Information Systems Technology Test	0.000	0.050	1.100	1.968	2.247	3.447	4.077

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The S&T community is developing advanced information systems technology (IST), both in Advanced Concept Technology Demonstrations (ACTDs) and in acquisition programs, to support DoD's Critical Transformational Capabilities—Conduct Information Operations, Deny Enemy Sanctuary, and Leverage Information Technologies. Successful implementation of these transformational capabilities will necessitate a corresponding transformation in DoD's ability to test and evaluate IST. Emerging revolutionary operational capabilities will require revolutionary OT&E scenarios, technologies, and analysis tools to ensure that new systems are adequately tested for operational use.

Advancements in communications and computing power are creating a new class of information systems. New IST will provide commanders and staffs with an adaptive, decision-centered, configurable information visualization environment, which will improve the speed and quality of command decisions. Other advances will enable a spectrum of capabilities ranging from advanced management and exploitation of intelligence, surveillance, and reconnaissance assets to next-generation tactical radio systems. Information assurance and survivability are central to IST development.

This T&E/S&T focus area will address the T&E capability required to ensure that the IST provided to the warfighter will deliver the assured and survivable ability to acquire, verify, protect and assimilate information necessary for our forces to neutralize and dominate any future adversary within a complex network-centric battlefield environment.

B. (U) ACCOMPLISHMENTS/PLANNED PROGRAM

	FY 2003	FY 2004	FY 2005
Information Systems Technology Test	0.000	0.050	1.100

FY 2003 Accomplishments:

In FY 2003, the roadmap for the IST Test focus area was developed as part of the T&E/S&T Program Test Technology Area Plan (TTAP). The IST Test focus area was reassessed for criticality and determined to merit initiation of activity in FY 2004.

FY 2004 Plans:

Although substantive efforts are planned to begin in FY 2005, the program will establish the foundation for the focus area in FY 2004. This effort includes exploration into centers of excellence for IST Test and identification of subject matter experts in this field. The T&E/S&T Program will issue a Broad Agency Announcement to select efforts for FY 2005 investigation. The focus will be developing and demonstrating technologies to objectively test IST. Areas of potential investigations are:

- Development of non-intrusive instrumentation and T&E communication networks (including networks of networks) that do not affect the performance of information systems under evaluation, especially for humans-in-the-loop network-centric environments
- Techniques for capturing spatial and temporal registration across large numbers of sensors, multimedia communications, and human-system interface devices
- Ability to assess information assurance within complex systems of systems
- Techniques to assess low probability of detection/low probability of intercept communications
- Techniques for capturing and evaluating multiple simultaneous collaborative user communications
- Ability to evaluate the success of information operations in terms of mission accomplishment, survivability of friendly forces, neutralization of enemy capabilities, etc.
- Techniques for capturing and evaluating human physical and cognitive performance
- Developing T&E capability to evaluate IST advances from a "human-out" perspective; i.e., determine what information actually enhances a warfighter's performance
- Methods for verification, validation, and accreditation of IST modeling and simulation

FY 2005 and Future Plans:

Efforts selected during FY 2004 will be initiated in FY 2005. Other IST T&E technology issues identified in FY 2004 and FY 2005 will be addressed in future plans. These efforts will focus on T&E capabilities required to assess the contribution of IST to decision superiority in operational scenarios. Advanced information systems must be assessed as "force multipliers" in network-centric operations. An objective methodology is required to assess operational effectiveness of warfighters while employing information systems of systems, especially the effect of information systems on human cognitive decision processes. Additional investigations will be initiated to address the technology issues associated with these and other facets of IST test.

C. (U) OTHER PROGRAM FUNDING NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)				February 2004			
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX				CENTRAL TEST AND EVALUATION INVESTMENT PROGRAM (CTEIP) PROGRAM ELEMENT (PE) 0604940D8Z			
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PE 0604940D	124.319	136.168	123.562	125.838	127.515	130.844	133.277

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Since its inception in FY 1990, this program element has been, and continues to be, used to fund the development of critically needed, high priority Test and Evaluation (T&E) capabilities for joint/multi-Service requirements. The Central Test and Evaluation Investment Program (CTEIP) uses a corporate investment approach to combine Service and Defense Agency T&E needs, maximize opportunities for joint efforts, and avoid unwarranted duplication of test capabilities. CTEIP focuses investments on projects that will have high productivity returns on investment. Projects under the CTEIP Program Element (PE) support two basic tasks: investments to improve the test capabilities base (Joint Improvement and Modernization (JIM) projects), and development of near-term solutions to test capability shortfalls in support of an ongoing operational test program (Resource Enhancement Project (REP)).

The JIM funds critically needed T&E investments in the major functional areas of test mission command, control, communications and instrumentation; electronic warfare systems; threat and computational simulation test and evaluation; space systems T&E; weapons effects test capabilities; targets; and physical and environmental test capabilities. The investments include both the demonstrations of advanced technologies needed to test increasingly complex and sophisticated weapon systems and the transition of these technologies into test capabilities. Examples of project subject matter include: automated data collection, processing, display and archiving; smart munitions testing; modeling and simulation; advanced electronic combat systems; low-observable technologies and signature measurements; targets and target control; time-space-position-information; end-game measurement; testing of advanced materials application; test design; and advanced sensors and space systems. CTEIP continues as the focal point for fostering common architectures throughout the test and training communities to enhance the sharing of resources and links between test and training ranges. CTEIP has provided special focus to institutionalize the use of M&S as a practical test tool; to link ranges through internetting to enhance inter-range and inter-Service cooperation and resource sharing; and, to ensure development and acquisition of common instrumentation necessary for a more efficient test infrastructure. Analyses of alternative solutions are conducted for each investment project to validate T&E requirements, to define integrated support systems, and to determine overall cost effectiveness of the proposed test

investments. The use of DoD-wide criteria for requirement validation, prioritization, and risk assessment ensures an effective test resource investment program.

The REP funds development of near-term solutions for critical ongoing operational tests supporting decisions on major, high priority defense acquisition programs. These unanticipated operational test (OT) capability requirements arise from several sources such as a new threat system identified during OT planning, acquisition of foreign military assets that are critical in determining weapon system operational effectiveness, short timelines between system design maturity and scheduled OT, and emerging technologies and test requirements resulting from operational concept changes mandated by Congress or DOT&E, or system of systems testing. Funding these activities under the CTEIP provides the opportunity to coordinate and integrate these near-term test requirements with the total DoD test and evaluation investment planning, and ensures their availability and legacy for other programs that may have similar testing requirements.

This Research Category 6.4 PE supports the development and application of proven technologies to provide major test and evaluation capabilities required to meet DoD component weapon system test requirements.

Program Accomplishments and Plans:

FY 2003 Accomplishments:

JIM Projects:

- Terminated the system development phase of the Decade Radiation Test Facility--Enhanced project to develop and field an upgraded, above ground, ionizing radiation test capability to meet existing and emerging nuclear weapons effects test requirements
- Completed the development of the Super High-Speed Visible (SHV) camera and the integration of an infrared sensor with the SHV, under the ASV project
- Completed development of the Roadway Simulator capability for heavy truck testing and continued development of a capability for tractor-trailer combination testing
- Completed efforts under the Advanced Range Telemetry project to improve the efficiency, reliability, utility, and availability of aeronautical telemetry spectrum by adapting advances in commercial communications technology
- Completed the Electromagnetic Environment Effects Generating System project to provide a multi-service test facility capable of assessing actual performance of a full-scale, fixed, or rotary-winged aircraft completely immersed in a user-specified radio frequency environment
- Completed the concept development phase and initiated the systems development phase of the Contamination Avoidance Detector Test Suite project to provide test methodology, instrumentation, and test fixtures required to test and evaluate current and developmental CB detector systems over the entire range of expected use conditions
- Continued development to meet threshold requirements of the Airborne Icing Tanker project to develop an airborne icing capability for testing various DoD aircraft systems at both high and low altitude, suitably presenting natural rain and icing conditions
- Continued the DVSD project to provide DoD T&E facilities and ranges new capabilities to collect, process, store, and distribute data from high-performance digital imagery systems

- Continued the concept development phase of the Soft Impact Location Capability project to provide the necessary instrumentation, signal processing, communication, and data processing capabilities to detect and locate the point and angle of impact of projectile and missile weapons within an 800m by 800m impact area
- Continued the Tri-Service Signature Measurement and Database System project to provide the capability to characterize the detailed spatial, spectral, and temporal signatures of aircraft, missiles, ground vehicles, ships, undersea vehicles, and their countermeasures in realistic environments
- Continued the concept development phase of the Enhanced Range Applications Project to provide a state-of-the-art Airborne Range Data System that supports the next generation data collection requirements
- Continued the concept development phase of the Joint C4ISR project to develop a capability to test increasingly complex multi-discipline fusion concepts
- Continued the Hardened Sub-Miniature Telemetry and Sensor System Product Improvement project to develop and demonstrate a new generation of rugged, miniaturized, on-board instrumentation applicable to smart munitions flight tests
- Continued the Infrared Sensor Stimulator product improvement, and initiated the Advanced Radar Environment Stimulator project and the Communications, Navigation and Identification follow-on project, under the Joint Installed Systems Test Facility Product Improvements project, to provide improved installed systems capabilities needed to support next generation aircraft testing
- Continued the development and demonstration of time-space-position information (TSPI), flight termination / safe arm (FTSA), and Telemetry functions on advanced missile platforms under the Joint Advanced Missile Instrumentation project
- Continued the system development phase of the Advanced Instrumentation Data & Control System project to develop state-of-the-art instrumentation and control systems to meet DoD T&E requirements for propulsion systems, aerodynamic systems and space systems
- Continued the system development phase of the Electromagnetic Transient Test and Evaluation Facility project to provide a capability to assess aircraft hardness to electro-magnetic transient environments to meet MILSTD 464 requirements
- Continued the system development phase of the Land and Sea Vulnerability Test Capability project to provide an instrumented land-sea interface test capability at the Aberdeen Test Center
- Continued the system development phase of the Multi-Service Target Control System project to provide upgraded target control systems that meet tri-Service requirements
- Continued the Test Technology Development and Demonstration project
- Continued the Tri-Service and CTEIP support projects
- Continued threat system simulator development efforts under the Threat System Simulator Development project to improve integration, reduce potential duplication in threat and target development, and ensure that accurate, cost-effective representations of threat systems are available to support testing
- Continued the DVL project to provide digital video data analysis and reporting capability
- Combined the concept development phase of the Joint Data Acquisition Network Standards project, to provide a suite of standards to establish component interoperability within a vehicular data acquisition network, with the Integrated Network Enhanced Telemetry effort

- Initiated standardization of the TENA object model and continued development of software tools and integration products within the Foundation Initiatives 2010 project
- Initiated the Joint Directed Energy Combat Operations and Employment project to develop a master range plan for directed energy weapons test and evaluation capabilities
- Initiated concept development for a project to develop a UHF digital flight termination system for DoD unmanned flight vehicles
- Initiated development of an integrated telemetry network architecture, building upon the Joint Data Acquisition Network System concept development phase
- Initiated the development of long-distance flight test procedures and flight demonstrations to support essential short-range and long-range test and evaluation for routine UAV usage in the U. S. National Airspace along side manned aircraft

Resource Enhancement Project:

- Completed the Standoff Cloud Referee System subproject to provide real time information on simulant aerosol cloud location, movement and concentration
- Completed the Common Vehicular Instrumentation Initiative subproject to develop a new generation of modular instrumentation to support vehicle and platform testing
- Completed the FIT Execution subproject to support the engineering effort required to incorporate the FIT protocols and spectrum efficient technologies in the design of the new Mobile Automated Instrumentation Suite transceivers
- Completed the Joint Information Assurance Laboratory subproject to develop a T&E capability based on a notional Global Information Grid configured to replicate the war fighter's operational environment
- Completed the Susceptibility Testing for Global Air Traffic Management Avionics subproject to define at the message level a signal set of harmful transmissions and develop an analysis capability to support evaluation of aircraft susceptibility
- Continued the Shallow Water ASW Target subproject to modify an existing, manned diesel-electric research submarine for use as an Anti ASW target to support Mk 54 and Mk 48 ADCAP torpedo testing
- Continued the Radio Frequency Phase Distribution Upgrade subproject, which procures Advanced Tactical Electronic Warfare Simulator (ATEWES) Microwave Phase Distribution (MDS) hardware and develops software subsystems to meet EA-6B Improved Capability (ICAP) III LR-700 receiver upgrade and planned follow-on interferometer receiver systems test
- Continued the AESA Jammer subproject to develop a simulator that can replicate three threat ground-to-air jammers
- Continued the Commander Air Defense Environment Test Tool subproject to develop a test tool to emulate, stimulate and evaluate the Single Integrated Air Picture C4I system of systems in support of the Area Air Defense Commander
- Continued the Weapon Set-to-Hit Threat Target subproject to provide an unmanned, cost effective target for conducting set-to-hit testing of existing and future torpedoes
- Continued to identify candidate subprojects based on critical OT&E test capability shortfalls
- Initiated the Advanced Mine Simulation System subproject to provide significant improvements to existing threat mine simulation test capabilities

- Initiated and completed the Biological Referee Instrumentation Towers subproject to provide mobile instrumentation equipment to support biological detection testing in multiple operational environments
- Initiated the Advanced System Endgame Methodology for Actual Threat Systems subproject to develop and integrate emerging technology for high fidelity, real time endgame assessment for threat system engagements in support of Comanche operational testing
- Initiated the Fire and Forget Missile Van Integration subproject to instrument and integrate critical MANPAD threats to evaluate F/A-18 expendable countermeasure effectiveness
- Initiated the Threat Signals A subproject to develop and implement new threat surface-to-air missile system signals in the Joint Communications Simulator to ensure testing in an operationally dense and coherent scenario based environment
- Initiated and completed the Battle Command Test Instrumentation subproject to provide instrumentation network encryption test capability to allow test operations to monitor and control geographically distributed platforms in a classified tactical operational environment and collect data on Battle Command on the Move
- Initiated the Seeker Integration subproject to characterize and integrate recently received foreign hardware into the ECR at China Lake, CA to support ongoing electronic countermeasure testing
- Initiated the Dense Environment Radio Frequency Injection subproject to develop and implement an RF signal simulator system to provide direct injection of a dense RF environment in to the system under test
- Initiated and completed the Scenario and Test Drivers subproject to modify the existing Simulation Injection and Generation System to include updated threat missile warning scenarios
- Initiated tasks/subprojects to resolve critical near term OT&E test capability shortfalls

Official Travel:

Performed official travel to carry out oversight of the CTEIP program

FY 2004 Plans:

JIM Projects:

- Complete development to meet threshold requirements of the Airborne Icing Tanker project to develop an airborne icing capability for testing various DoD aircraft systems at both high and low altitude, suitably presenting natural rain and icing conditions
- Complete development of the limited Roadway Simulator capability for tractor-trailer combination testing
- Complete the Electromagnetic Transient Test and Evaluation Facility project to provide a capability to assess aircraft hardness to electro-magnetic transient environments to meet MILSTD 464 requirements
- Complete the Multi-Service Target Control System project to provide upgraded target control systems that meet tri-Service requirements
- Complete the Test Technology Development and Demonstration project
- Complete the Joint Directed Energy Combat Operations and Employment project to develop a master range plan for directed energy weapons test and evaluation capabilities
- Complete the project to develop and demonstrate a new generation of rugged, miniaturized, on-board instrumentation applicable to smart

munitions flight tests, within the Hardened Sub-Miniature Telemetry and Sensor System Product Improvement project

- Complete the concept development phase and initiate the systems development phase of the Soft Impact Location Capability project to provide the necessary instrumentation, signal processing, communication, and data processing capabilities to detect and locate the point and angle of impact of projectile and missile weapons within an 800m by 800m impact area
- Complete concept development phase and initiate the system development phase of the Enhanced Range Applications Project to provide a state-of-the-art Airborne Range Data System that supports the next generation data collection requirements
- Complete concept development phase and initiate the system development phase of the Joint C4ISR project to develop a capability to test increasingly complex multi-discipline fusion concepts
- Complete concept development and initiate systems development for a project to develop a UHF digital flight termination system for DoD unmanned flight vehicles
- Complete requirements documentation and development of roadmap for future investments under the Digital Video Systems Development project to provide DoD test and evaluation facilities and ranges new capabilities to collect, process, store, and distribute data from high-performance digital imagery systems
- Complete the Tri-Service Signature Measurement and Database System project to provide the capability to characterize the detailed spatial, spectral, and temporal signatures of aircraft, missiles, ground vehicles, ships, undersea vehicles, and their countermeasures in realistic environments
- Complete validation of flight test procedures and UAV operations in the U. S. National Airspace along side manned aircraft
- Continue standardization of the TENA object model and the development of software tools and integration products within the Foundation Initiatives 2010 project
- Continue the DVL project to provide digital video data analysis and reporting capability
- Continue the Land and Sea Vulnerability Test Capability project to provide an instrumented land-sea interface test capability at the Aberdeen Test Center
- Continue the Infrared Sensor Stimulator product improvement, the Advanced Radar Environment Stimulator project, and the Communications, Navigation and Identification follow-on, and initiate development of the Two-Color Infrared Missile Warning System Stimulator under the Joint Installed Systems Test Facility Product Improvements project, to provide improved installed systems capabilities needed to support next generation aircraft testing
- Continue the development and demonstration of time-space-position information (TSPI), flight termination / safe arm (FTSA), and Telemetry functions on advanced missile platforms under the Joint Advanced Missile Instrumentation project
- Continue the system development phase of the Advanced Instrumentation Data & Control System project to develop state-of-the-art instrumentation and control systems to meet DoD T&E requirements for propulsion systems, aerodynamic systems and space systems
- Continue the system development phase of the Contamination Avoidance Detector Test Suite project to provide test methodology, instrumentation, and test fixtures required to test and evaluate current and developmental CB detector systems over the entire range of expected use conditions

- Continue the Tri-Service and CTEIP support projects
- Continue threat system simulator development efforts under the Threat System Simulator Development project to improve integration, reduce potential duplication in threat and target development, and ensure that accurate, cost-effective representations of threat systems are available to support testing
- Initiate concept development for a project to develop a network-enhanced telemetry capability for T&E ranges and facilities
- Initiate concept development for an advanced digital range radar suite to perform common test and evaluation range tracking functions required for next generation weapon systems and targets
- Initiate concept development for improved test and evaluation capabilities for directed energy weapons
- Initiate and complete development of system enhancements under the Airborne Separation Video project
- Initiate and complete requirements identification and concept development for using unmanned systems in training, operational exercises, and test and evaluation
- Initiate Missile Engagement Threat Simulator project to develop an enhanced capability to evaluate the vulnerability of aircraft to Man-Portable Air Defense Systems (MANPADS)
- Initiate concept development for infrared spectrum test instrumentation for open air ranges

Resource Enhancement Project:

- Complete the Advanced Mine Simulation System subproject to provide significant improvements to existing threat mine simulation test capabilities
- Complete the Advanced System Endgame Methodology for Actual Threat Systems subproject to develop and integrate emerging technology for high fidelity, real time endgame assessment for threat system engagements in support of Comanche operational testing
- Complete the Fire and Forget Missile Van Integration subproject to instrument and integrate critical MANPAD threats to evaluate F/A-18 expendable countermeasure effectiveness
- Complete the Dense Environment Radio Frequency Injection subproject to develop and implement an RF signal simulator system to provide direct injection of a dense RF environment in to the system under test
- Complete the Shallow Water ASW Target subproject to modify an existing, manned diesel-electric research submarine for use as an Anti ASW target to support Mk 54 and Mk 48 ADCAP torpedo testing
- Complete the AESA Jammer subproject to develop a simulator that can replicate three threat ground-to-air jammers
- Complete the Commander Air Defense Environment Test Tool subproject to develop a test tool to emulate, stimulate and evaluate the Single Integrated Air Picture C4I system of systems in support of the Area Air Defense Commander
- Complete the Threat Signals A subproject to develop and implement new threat surface-to-air missile system signals in the Joint Communications Simulator to ensure testing in an operationally dense and coherent scenario based environment
- Complete the Weapon Set-to-Hit Threat Target subproject to provide an unmanned, cost effective target for conducting set-to-hit testing of existing and future torpedoes
- Complete the Radio Frequency Phase Distribution Upgrade subproject, which procures Advanced Tactical Electronic Warfare Simulator

(ATEWES) Microwave Phase Distribution (MDS) hardware and develops software subsystems to meet EA-6B Improved Capability (ICAP) III LR-700 receiver upgrade and planned follow-on interferometer receiver systems test

- Continue the Seeker Integration subproject to characterize and integrate recently received foreign hardware into the ECR at China Lake, CA to support ongoing electronic countermeasure testing
- Continue to identify candidate subprojects based on critical OT&E test capability shortfalls
- Initiate and continue tasks/subprojects to resolve critical near term OT&E test capability shortfalls
- Initiate the National Warning Network Scenarios and Test Tools subproject to build scenarios, test drivers and test tools for new OT requirements resulting from real-world events and recent program and threat changes
- Initiate the Voice/Video Emulation Test Tool subproject to develop two digital voice emulation systems to stimulate and evaluate voice and videotransmissions from realistic operational ranges in support of tactical command and control systems
- Initiate the SIIRCM Instrumentation Suite subproject to upgrade the Super Multi-role Electro-Optic Simulator to incorporate a night vision camera, multi-band laser detector, and laser range finder to simulate characteristics of UV and IR signatures
- Initiate the SSST Stream Raid subproject to provide two Anti-Ship Cruise Missile threat targets with near simultaneous arrivals on similar bearings to resolve the system track management, coordinated combat direction, and survivability COIs
- Initiate the TSPI Advanced Tracker subproject to upgrade the current TAT with long range acquisition radar to increase its ability to acquire and track targets at greater distances, in low light, and in obscured weather
- Initiate the EFV Threat Vehicle Surrogate Targets subproject to develop 2½-D infrared (IR) plastic ground surrogate targets to emulate the appearance, thermal signature, and mobility of BMD-2, BMP-2, BTR-70, and BRDM-2 threat vehicles
- Initiate the Small Contingency Theater Positioning System subproject to develop a system that will enable time, space, position information of test assets in environments encountered under small contingency operations (Military Operation Urbanized Terrain, Urban, mountains, caves, etc.)
- Initiate the Foreign Targets Surrogate subproject to develop 8 threat mine surrogates for use in COMOPTEVFOR operational tests and assessments of Mine Countermeasure systems
- Initiate the SSST Enhanced Maneuverability subproject to upgrade the GQM-163A target design to perform square wave inputs to perform terminal weaves which will more closely represent threat anti-ship missile maneuvers

Official Travel:

Perform official travel to carry out oversight of the CTEIP program

FY 2005 Plans:

JIM Projects:

- Complete the development and demonstration of time-space-position information (TSPI), flight termination / safe arm (FTSA), and Telemetry functions on advanced missile platforms under the Joint Advanced Missile Instrumentation project
- Complete concept development and initiate systems development for the project to develop a network-enhanced telemetry capability for T&E ranges and facilities

- Complete concept development and initiate systems development for an advanced digital range radar suite to perform common test and evaluation range tracking functions required for next generation weapon systems and targets
- Complete concept development and initiate systems development for improved test and evaluation capabilities for directed energy weapons
- Complete standardization of the TENA object model and the development of software tools and integration products within the Foundation Initiatives 2010 project
- Complete the DVL project to provide digital video data analysis and reporting capability
- Complete the Missile Engagement Threat Simulator project to develop an enhanced capability to evaluate the vulnerability of aircraft to Man-Portable Air Defense Systems (MANPADS)
- Complete concept development and initiate system development for infrared spectrum test instrumentation for open air ranges
- Continue the Land and Sea Vulnerability Test Capability project to provide an instrumented land-sea interface test capability at the Aberdeen Test Center
- Continue the systems development phase of the Soft Impact Location Capability project to provide the necessary instrumentation, signal processing, communication, and data processing capabilities to detect and locate the point and angle of impact of projectile and missile weapons within an 800m by 800m impact area
- Continue the Infrared Sensor Stimulator product improvement and the Advanced Radar Environment Stimulator project, and complete the Communications, Navigation and Identification follow-on and the Two-Color Infrared Missile Warning System Stimulator under the Joint Installed Systems Test Facility Product Improvements project, to provide improved installed systems capabilities needed to support next generation aircraft testing
- Continue the system development phase of the Advanced Instrumentation Data & Control System project to develop state-of-the-art instrumentation and control systems to meet DoD T&E requirements for propulsion systems, aerodynamic systems and space systems
- Continue the system development phase of the Contamination Avoidance Detector Test Suite project to provide test methodology, instrumentation, and test fixtures required to test and evaluate current and developmental CB detector systems over the entire range of expected use conditions
- Continue the system development phase of the Enhanced Range Applications Project to provide a state-of-the-art Airborne Range Data System that supports the next generation data collection requirements
- Continue the system development phase of the Joint C4ISR project to develop a capability to test increasingly complex multi-discipline fusion concepts
- Continue the Tri-Service and CTEIP support projects
- Continue threat system simulator development efforts under the Threat System Simulator Development project to improve integration, reduce potential duplication in threat and target development, and ensure that accurate, cost-effective representations of threat systems are available to support testing
- Continue systems development of the project to develop a UHF digital flight termination system for DoD unmanned flight vehicles

Resource Enhancement Project:

- Complete the Seeker Integration subproject to characterize and integrate recently received foreign hardware into the ECR at China Lake, CA to support ongoing electronic countermeasure testing
- Continue to identify candidate subprojects based on critical OT&E test capability shortfalls
- Initiate and continue tasks/subprojects to resolve critical near term OT&E test capability shortfalls

Official Travel:

Perform official travel to carry out oversight of the CTEIP program

B. (U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2003	FY 2004	FY 2005
FY 2004 President's Budget	122.294	123.215	124.444
Current Budget Submit	124.319	136.168	123.562
Total Adjustments		12.953	(0.882)
Congressional Program Reductions		(1.947)	
Congressional Rescissions			
Congressional Increases		14.900	
Digital Video Lab		3.000	
Airborne Separation Video System		1.000	
Roadway Simulator		3.400	
UAV Sys & Ops Validation Facility		4.900	
Unmanned Systems Testbed		2.600	
Reprogramming	2.025[1]		
Inflation Adjustment			(0.882)

Notes:

1. **Transfer of Unmanned Aerial Vehicle Long Range Test Range program from Appropriation 0400 RDT&E Defense-Wide PE 0605804D to Appropriation 0460 DOT&E PE 0605940D based on Congressional intent**

C. (U) OTHER PROGRAM FUNDING NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)				February 2004			
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX				OPERATIONAL TEST AND EVALUATION (OT&E) PROGRAM ELEMENT (PE) 0605118D8Z			
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PE 0605118D	27.472	37.006	42.390	44.142	47.843	49.696	53.424

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Director of Operational Test and Evaluation (DOT&E) is responsible under Title 10 for policy and procedures for all aspects of operational test and evaluation within the Department of Defense (DoD), with particular focus on OT&E that supports major weapon system production decisions. Generally, there are over 250 programs and Advanced Concept Technology Demonstrations (ACTD) on the DOT&E oversight list including 79 Major Defense Acquisition Programs (MDAPs). These MDAPs may not proceed beyond low-rate initial production (LRIP) until OT&E of the program is completed. This requires early involvement by DOT&E in the planning phase of each program to ensure adequate testing and satisfactory progress through the acquisition milestones toward operational effectiveness and suitability goals and full-rate production. Key elements of the DOT&E's oversight authority include: the approval of component Test and Evaluation Master Plans (TEMPs); Service OT&E plans; observation of, preparation for, and conduct of, field operational tests; analysis, evaluation, and assessment of the adequacy of OT&E and the operational effectiveness and suitability of the weapon system; reporting results of OT&E that supports beyond LRIP decisions to the Secretary of Defense and Congress, as well as an annual report summarizing all OT&E activities and addressing the adequacy of test resources within the DoD during the previous fiscal year; and participation in DoD-wide planning, programming and budgeting activities to highlight test and evaluation capabilities, needs and priorities. The FY 2003 Appropriations Bill provided $7.6M and direction to Combatant Commands, Services, and the T&E community to perform operational evaluations of Information Assurance and interoperability of fielded systems during major exercises. This PE also includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, as well as funds to perform official travel in support of its activities.

This Research Category 6.5 PE supports management activities for the DOT&E for oversight of operational test and evaluation of the Department's weapon systems.

Program Accomplishments and Plans:

FY 2003 Accomplishments: Key elements of DOT&E's oversight authority, as described under MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION, were conducted, as applicable, for the following programs:

Land Warfare Programs:

- Abrams Tank Upgrade
- Advanced Field Artillery Tactical Data System (AFATDS)
- Aerial Common Sensor (ACS)
- AN/TPQ-47 Counterfire Radar
- Army Tactical Missile System Block II / Brilliant Anti-Armor Submunition (ATACMS/BAT) (includes ATACMS Block II/IIA/BAT P3I
- Army Theater Support Vessel (TSV)
- Artemis (Chemical Agent Standoff Detection System)
- Battlefield Combat Identification System (BCIS)
- Bradley Upgrade
- CH-47F Cargo Helicopter Upgrade
- Chemical Biological Defense Program (includes Artemis, JBAIDS, JBPDS, JBSDS, JCAD, JSFDS, JSLNBCR, JSLSCAD, JSSED, JWARN)
- Chemical Demilitarization
- Comanche (RAH-66) (includes 20mm Ammunition)
- Distributed Common Ground System (DCGS) – Air Force
- Excalibur Family of Precision (155mm) Projectiles
- Family of Medium Tactical Vehicles (FMTV)
- Force XXI Battle Command Brigade & Below (FBCB2)
- Forward Area Air Defense System (FAADS) C2I
- Future Combat System and all associated systems
- Guided Multiple Launch Rocket System (GMLRS)
- High Mobility Artillery Rocket System (HIMARS)
- Javelin Advanced Anti-tank Missile – Medium
- Joint Common Missile
- JTRS Clusters 1 & 5
- Kiowa Warrior (OH-58D)
- Land Warrior
- Line-of-Sight Anti-Tank Missile (LOSAT)

- Longbow Apache (AH-64D)
- Longbow Hellfire Missile (Upgrades/Modifications)
- Mid Range Munitions
- Objective Individual Combat Weapon System (OICWS)
- Precision Guided Mortar Munitions (PGMM)
- Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)
- Single Channel Anti-Jam Man-Portable (SCAMP) (MILSTAR, Block II)
- Stinger Re-programmable Microprocessor Missile (RMP)
- Stryker Armored Vehicle
- Surface-Launched AMRAAM (SLAMRAAM)
- Black Hawk - Upgrades (UH-60M)XM8 Lightweight Modular Weapon System
- XM29 Integrated Air Burst Weapon

Naval Warfare Programs:

- Acoustic Rapid COTS Insertion for SONAR
- Advanced Deployable Systgem (ADS)
- Advanced Seal Delivery System (ASDS)
- Affordable Weapon System (AWS)
- Airborne Mine Neutralization System (AMNS)AN/SPY-1 B/D (All Versions)
- AN/WSQ-11 Countermeasure Anti-Torpedo
- Broad Area Maritime Surveillance (BAMS)
- Cobra Judy Replacement – Ship-based Radar System
- Cooperative Engagement Capability (CEC)
- Cruiser Conversion
- CVN 21 New Generation Nuclear Attack CarrierCVN 68 Nimitz Class
- DD(X) Future Surface Combatant
- DDG-51 Guided Missile Destroyer (All Variants)
- Evolved Seasparrow Missile (ESSM)
- Expeditionary Fighting Vehicle
- Extended Range Guided Munition (ERGM)
- Fixed Distributed System (FDS
- Integrated Surface Ship ASW Combat System (AN/SQQ-89)
- JTRS Cluster 3
- Littoral Combat Ship (LCS)LHA(R) New Amphibious Assault Ship

- LHD 1 Amphibious Assault Ship
- LHD 8 Amphibious Assault Ship
- Long Range Land Attack Projectile
- LPD 17 Amphibious Transport Dock (includes 30mm ammunition)
- Maritime Prepositioning Force (Future)
- MH-60R Helicopter
- MH-60S Helicopter
- MK-48 Torpedo Mods
- Naval Integrated Fire Control-Counter Air (NIFC-CA)
- Rapid Airborne Mine Clearance System (RAMICS)
- Rolling Airframe Missile (RAM)
- SSGN OHIO Class Conversion
- Ship Self Defense System (SSDS)
- SSN-21 Seawolf / AN/BSY-2
- SSN-23 Jimmy Carter
- SSN-774 Virginia
- Standard Missile-2 (SM-2) (Blocks I/II/III/IV)
- Standard Missile-6 (SM-6) Extended Range Active Missile (ERAM)
- Strategic Sealift Program (SSP) Ship Class
- Submarine Exterior Communication System (SubECS)
- Surveillance Towed Array Sensor System (SURTASS) / Low Frequency Active (LFA)
- Tactical Control System (TCS)
- Tactical Tomahawk Missile
- T-AKE Lewis & Clark Class of Auxiliary Dry Cargo Ships
- T-AOE(X) Fast Combat Support Ship

Air Warfare Programs:

- Active Electronically Scanned Array (AESA)
- Advanced Medium Range Air-to-Air Missile (AMRAAM)
- AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)
- AIM-9X Missile
- Air Early Warning (AEW)
- AV-8B Remanufacture
- B-1B Lancer Conventional Munitions Upgrade Program (CMUP)

- B-2 Radar Modernization Program (B-2 RMP)
- B-2A Spirit Stealth Bomber
- C-130 Avionics Modernization Program (AMP)
- C-130J Hercules Cargo Aircraft (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
- C-17 Globemaster III Advanced Cargo Aircraft
- C-5 Avionics Modernization Program (AMP)
- C-5 Reliability & Reengineering Program (RERP)
- CH-53X Upgrade to USMC H-53 Progrm
- Combat Survivor/Evader Locator (CSEL)
- E-10 Multi-Sensor Command & Control Aircraft (MC2A)
- EA-18G (electronic variant of F/A-18)
- F-117 IR Acquisition and Designation System (IRADS)
- F/A-18 E/F Hornet Naval Strike Fighter (all variants)
- F/A-22 Advanced Tactical Fighter
- F-35 Joint Strike Fighter (JSF)
- E-2C Advanced Hawkeye (E-2C Radar Modernization Program (RMP)
- E-2C Reproduction Hawkeye
- Global Hawk High Altitude Endurance UAV (HAEUAV)
- Joint Air-to-Surface Strike Missile (JASSM) and JASSM Expanded Response (ER)
- Joint Direct Attack Munition (JDAM)
- Joint Helmet Mounted Cueing System
- Joint Mission Planning System (JMPS)
- Joint Primary Aircraft Training System (JPATS)
- Joint Standoff Weapon (JSOW) Baseline/BLU-108/UnitaryJoint Surveillance Target Attack Radar System (JSTARS)
- Joint UCAS (includes Air Force and Navy UAV Programs)
- JTRS Cluster 4
- KC-135 Global Air Traffic Management (GATM) Upgrade
- KC-767 Aerial Tanker Aircraft
- Multi-Mission Maritime Aircraft (MMA)
- Personnel Recovery Vehicle (PRV)
- Predator UAV (RQ/MQ-1, MQ-9)
- Sensor Fuzed Weapon (SFW) P3I (CBU-97/B)
- Small Diameter Bomb

- Standoff Land Attack Missile – Expanded Response (SLAM-ER)
- T-45TS (Undergraduate Jet Pilot Training System)
- USMC H1 Upgrades (4BW/4BN)
- V-22 Osprey
- Vertical Take-Off UAV (VTUAV)VXX (VH-3D) Presidential Helicopter Fleet Replacement Program

Electronic Warfare Programs:

- Advanced Threat IR Countermeasures/Common Missile Warning System (ATIRCM/CMWS)
- AN/AAR-47 V2 Upgrade Missile/Laser Warning Receiver
- AN/ALR-56M Radar Warning Receiver
- AN/ALR-67 Advanced Special Receiver (ASR) V2 & V3
- AN/ALR-69 Radar Warning Receiver
- AN/APR-39A V2 Radar Warning Receiver
- EA-6B Improved Capabilities (ICAP) III & Multiple Upgrades
- F-15 Tactical Electronic Warfare System (TEWS) including AN/ALQ-135 Band 1.5 Fiber-Optic Towed Decoy
- Integrated Defensive Electronic Countermeasures (IDECM)
- Large Aircraft IRCM (LAIRCM)
- Suite of Integrated Radio Frequency Countermeasures (SIRFC) (AN/ALQ-211)
- Surface Electronic Warfare Improvement Program (SEWIP)

Command, Control, Communications, and Intelligence Programs:

- Advanced Field Artillery Tactical Data System (AFATDS)/ Army Battle Command System (ABCS)
- Air and Missile Defense Planning and Control System (AMDPCS)
- Air Force Mission Support System (AFMSS)
- All Source Analysis System (ASAS) (ABCS)
- Army Global Command and Contrail System (AGCCS)
- Broad Area Maritime Surveillance (BAMS)
- Business Systems Modernization (BSM)
- Combat Service Support Control System (CSSCS)/ABCS
- Composite Health Care System II (CHCS II)
- Corporate Executive Information System (CEIS)
- Defense Civilian Personnel Data System (DCPDS)
- Defense Integrated Military Human Resources System (DIMHRS)
- Defense Joint Accounting System (DJAS)
- Defense Medical Logistics Standard Support (DMLSS)

- Defense Message System (DMS)
- Defense Procurement Payment System (DPPS)
- DFAS Corporate Database/Warehouse (DCD/DCW)
- Distributed Common Ground System - Air Force (DCGS-AF)
- E-2C Hawkeye Airborne Early Warning
- E-3A Airborne Warning and Control System (AWACS) Radar System Improvement Program (RISP)
- Force XXI Battle Command Brigade and Below (FBCB2)
- Forward Area Air Defense Command Control Communications and Intelligence System (FAAD C3I)/ABCS
- Fuels Automated System (FAS)
- Global Command and Control System (GCCS) – Joint
- Global Command and Control System (GCCS) – Maritime
- Global Command and Control System -Air Force (GCCS-AF)
- Global Command Support System -Air Force (GCSS-AF)
- Global Transportation Network (GTN-21)
- Integrated Logistics System-Supply (ILS-S)
- Integrated Maintenance Data System (IMDS)
- Integrated System Control (ISYSCON)/Tactical Internet Manager (TIMS)
- Joint Computer Aided Acquisition and Logistics Support (JCALS)
- Joint Mission Planning System (JMPS)
- Joint Precision Approach and Landing System (JPALS)
- Joint Simulation System (JSIMS)/Warfighter Simulation (WARSIM)
- Joint Tactical Radio System Cluster 1
- Joint Tactical Radio Waveforms
- Maneuver Control System (MCS)/ABCS
- Multifunctional Information Distribution System (MIDS)
- Multiple Platform - Common Data Link (MP-CDL)
- NAVSTAR GPS User Equipment (UE)
- Navy Marine Corps Intranet (NMCI)
- Navy Standard Integrated Personnel System (NSIPS)
- Public Key Infrastructure (PKI)
- Reserve Component Automation System (RCAS)
- Tactical Aircraft Mission Planning System (TAMPS)
- Theater Medical Information Program (TMIP)

- Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II)
- Warfighter Information Network – Terrestrial (WIN-T)

Strategic Warfare and Space Systems Programs:

- Advanced EHF (AEHF)
- Advanced Wide Band System
- MDA Program
- Evolved Expendable Launch Vehicle (EELV)
- Global Broadcast System (GBS)
- Ground Based Midcourse Defense Segment
- Medium Extended Air Defense System (MEADS)
- Minuteman III Guidance Replacement Program (GRP) Phase I
- Minuteman III Propulsion Replacement Program (PRP)
- Mobile User Objective System (MUOS)
- Multi-Platform Radar Technology Insertion Program (MP-RTIP)
- National Airspace System (NAS)
- National Polar-Orbiting Operational Environment Satellite (NPOESS)
- Navy EHF SATCOM Program (NESP)
- Patriot Advanced Capability-3 (PAC-3) Missile
- Sea Based Midcourse Defense Segment
- Space-Based Infrared System-High (SBIRS-H)
- Space-Based Infrared System-Low (SBIRS-L)
- Space-Based Laser
- Tactical Tomahawk Mission Planning System / Tomahawk Command & Control System (MPS/TCCS)
- Teleport
- Theater High-Altitude Area Defense (THAAD) / GBR
- Titan IV
- Trident II Missile
- Ultra High Frequency (UHF) Follow-on Satellite
- Wideband Gapfiller Satellite (WGS)
- YAL-1 Airborne Laser (ABL)

Information Assurance and Interoperability Evaluations:

- Convened workshops and meetings to initiate this effort. Specific goals included identification of candidate FY03-04 exercises; development of a plan to enhance, train, and certify Service Red Teams; and identification of metrics that will serve the multiple organizations that will employ the results of these evaluations. Available exercises were observed, but expanded Red Teaming was limited.

Official Travel:

- Performed official travel to carry out oversight of the OT&E of the DoDs weapons systems.

FY 2004 Plans: Key elements of DOT&E's oversight authority, as described under MISSION ACCOMPLISHMENT AND BUDGET ITEM JUSTIFICATION, will be conducted, as applicable, for the following programs:

Land Warfare Programs:

- Abrams Tank Upgrade
- Advanced Field Artillery Tactical Data System (AFATDS)
- Aerial Common Sensor (ACS)
- AN/TPQ-47 Counterfire Radar
- Army Tactical Missile System Block II / Brilliant Anti-Armor (ATACMS/BAT) and ATACMS Block II / P3I BAT
- Artemis (Chemical Agent Standoff Detection System)
- Battlefield Command Information System (BCIS)
- Bradley Upgrade
- CH-47F Cargo Helicopter Upgrade
- Chemical Biological Defense Program (includes Artemis, JBAIDS, JBPDS, JBSDS, JCAD, JSFDS, JSLNBCR, JSLSCAD, JSSED, JWARN)
- Chemical Demilitarization
- Comanche (RAH-66) (includes 20mm Ammunition)
- Common Missile
- Distributed Common Ground System (DCGS) - ARMY
- Excalibur (155mm Round)
- Family of Medium Tactical Vehicles (FMTV)
- Future Combat System (includes manned and unmanned ground vehicles, unmanned air vehicles)
- Future Scout/Cavalry System
- Guided Multiple Launch Rocket System (GMLRS)
- High Mobility Artillery Rocket System (HIMARS)
- Javelin Anti-tank Missile
- Joint Warning & Reporting Network

- Kiowa Warrior (OH-58D)
- Land Warrior
- Line-of-Sight Anti-Tank Missile (LOSAT)
- Longbow Apache (AH-64D)
- Longbow Hellfire Missile (Upgrades/Modifications)
- Objective Crew Served Weapon System (OCSWS)
- Objective Individual Combat Weapon System (OICWS)
- Precision Guided Mortar Munitions (PGMM)
- Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)
- Sensor Fused Munition
- Single Channel Anti-Jam Man-Portable (SCAMP) (MILSTAR, Block II)
- Stinger Re-programmable Microprocessor Missile (RMP)
- Stryker Armored Vehicle
- Surface-Launched AMRAAM (SLAMRAAM)
- Tow-Fire & Forget Anti-tank Missile
- UH-60M Black Hawk - All Upgrades

Naval Warfare Programs:

- Acoustic Rapid COTS Insertion for SONAR
- Advanced Amphibious Assault Vehicle (AAAV) - Includes 30mm ammunition
- Advanced Seal Delivery System (ASDS)
- Airborne Mine Neutralization System / Rapid Airborne Mine Clearance System (AMNS/RAMICS)
- Amphibious Assasult - Dock (LPD-17) Ship Class - Includes 30mm ammunition
- Amphibious Helicopter - Assault (Replacement) (LHA(R)) Ship Class
- Amphibious Helicopter - Dock (LHD) Ship Class
- AN/SPY-1 B/D (All Versions)
- Auxiliary Cargo / Ammunition Ship Class (T-AKE)
- Cobra Judy Replacement – Ship-based Radar System
- Cooperative Engagement Capability (CEC)
- Cruiser Conversion
- CVN (X) Class
- CVN 68 Nimitz Class
- DD(X) land attack destroyer
- DDG-51 Destroyer (All Variants)

- EA-18G (electronic variant of F/A-18)
- Evolved Sea Sparrow Missile (ESSM)
- Extended Range Active Missile
- Extended Range Guided Munition (ERGM)
- Fixed Distributed System / Advanced Deployable System (FDS/ADS)
- HyFly
- Integrated Surface Ship ASW Combat System (AN/SQQ-89)
- Joint Command and Control Capability (JCC(X)) Ship Class
- Littoral Combat Ship (LCS)
- Maritime Prepositioning Force (Future)
- MH-60R Helicopter
- MH-60S Helicopter
- MK-48 MODS ADCAP Torpedo
- Naval Integrated Fire Control-Counter Air (NIFC-CA)
- Rolling Airframe Missile (RAM)SSGN Trident Class Conversion
- Ship Self Defense System (SSDS)
- SSN-21 Seawolf / AN/BSY-2
- SSN-23 Jimmy Carter
- SSN-774 Virginia CLASS
- Standard Missile-2 (SM-2) (Blocks I/II/III/IV)
- Strategic Sealift Program (SSP) Ship Class
- SUB COMMS (SubECS)
- Surveillance Towed Array Sensor System (SURTASS) / Low Frequency Active (LFA)
- Tactical Control System (TCS)
- Tactical Tomahawk Missile
- T-AOE(X) Triple Product Station Ship

Air Warfare Programs:

- Active Electronically Scanned Array (AESA)
- Advanced Medium Range Air-to-Air Missile (AMRAAM)
- AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)
- AIM-9X Missile
- Air Early Warning (AEW)
- B-1B Lancer Conventional Munitions Upgrade Program (CMUP)

- B-2 Radar Pathfinder Program (B-2 RPP)
- B-2A Spirit Stealth Bomber
- C-130 Avionics Modernization Program (AMP)
- C-130J All Variants (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
- C-17 Aircraft
- C-5 Avionics Modernization Program (AMP)
- C-5 Reliability & Reengineering Program
- Combat Search and Rescue Replacement
- Combat Survivor/Evader Locator
- F/A-18 E/F Hornet
- F-22 Fighter
- Global Hawk High Altitude Endurance UAV (HAEUAV)
- Joint Air-to-Surface Strike Missile (JASSM)
- Joint Direct Attack Munition (JDAM)
- Joint Helmet Mounted Cueing System
- Joint Primary Aircraft Training System (JPATS)
- Joint Standoff Weapon (JSOW) Baseline
- Joint Standoff Weapon (JSOW) BLU-108
- Joint Standoff Weapon (JSOW) Unitary
- Joint Strike Fighter (JSF)
- Joint Surveillance Target Attack Radar System (JSTARS)
- KC-135 Global Air Traffic Management (GATM) Upgrade
- KC-767 Aerial Tanker Aircraft
- Multi-Mission Maritime Aircraft (MMA)
- Predator UAV (RQ/MQ-1, MQ-9)
- Sensor Fuzed Weapon (SFW) P3I (CBU-97/B)
- Small Diameter Bomb
- Standoff Land Attack Missile – Expanded Response (SLAM-ER)
- UCAV (Air Force)
- UCAV (Navy)
- USMC H1 Upgrade
- V-22 Osprey
- Vertical Take-Off UAV (VTUAV)

Electronic Warfare Programs:

- Advanced Threat IR Countermeasure/Common Missile Warning System (ATIRCM/CMWS)
- AN/AAR-47 V2 Upgrade Missile/laser Warning Receiver
- AN/ALR-56 (All Versions) Radar Warning Receiver-All Upgrades
- AN/ALR-67 (All Versions)-includes AN/ALR-67(V)
- AN/ALR-69 Radar Warning Receiver
- AN/APR-39A V2 Radar Warning Receiver
- EA-6B Improved Capabilities (ICAP) III & Multiple Upgrades
- F-15 Tactical Electronic Warfare System (TEWS) including AN/ALQ-135 Band 1.5 Fiber-Optic Towed Decoy
- Integrated Defensive Electronic Countermeasures (IDECM)
- Large Aircraft IRCM (LAIRCM)
- Suite of Integrated Radio Frequency Countermeasures (SIRFC)
- Surface Electronic Warfare Improvement Program (SEWIP)

Command, Control, Communications, and Intelligence Programs:

- Advanced Field Artillery Tactical Data System (AFATDS)/ Army Battle Command System (ABCS)
- Air and Missile Defense Planning and Control System (AMDPCS)
- Air Force Mission Support System (AFMSS)
- All Source Analysis System (ASAS) (ABCS)
- Army Global Command and Contrail System (AGCCS)
- Broad Area Maritime Surveillance (BAMS)
- Business Systems Modernization (BSM)
- Combat Service Support Control System (CSSCS)/ABCS
- Composite Health Care System II (CHCS II)
- Corporate Executive Information System (CEIS)
- Defense Civilian Personnel Data System (DCPDS)
- Defense Integrated Military Human Resources System (DIMHRS)
- Defense Joint Accounting System (DJAS)
- Defense Medical Logistics Standard Support (DMLSS)
- Defense Message System (DMS)
- Defense Procurement Payment System (DPPS)
- DFAS Corporate Database/Warehouse (DCD/DCW)
- Distributed Common Ground System - Air Force (DCGS-AF)
- E-2C Hawkeye Airborne Early Warning

- E-3A Airborne Warning and Control System (AWACS) Radar System Improvement Program (RISP)
- Force XXI Battle Command Brigade and Below (FBCB2)
- Forward Area Air Defense Command Control Communications and Intelligence System (FAAD C3I)/ABCS
- Fuels Automated System (FAS)
- Global Command and Control System (GCCS) – Joint
- Global Command and Control System (GCCS) – Maritime
- Global Command and Control System -Air Force (GCCS-AF)
- Global Command Support System -Air Force (GCSS-AF)
- Global Transportation Network (GTN-21)
- Integrated Logistics System-Supply (ILS-S)
- Integrated Maintenance Data System (IMDS)
- Integrated System Control (ISYSCON)/Tactical Internet Manager (TIMS)
- Joint Computer Aided Acquisition and Logistics Support (JCALS)
- Joint Mission Planning System (JMPS)
- Joint Precision Approach and Landing System (JPALS)
- Joint Simulation System (JSIMS)/Warfighter Simulation (WARSIM)
- Joint Tactical Radio System Cluster 1
- Joint Tactical Radio Waveforms
- Maneuver Control System (MCS)/ABCS
- Multifunctional Information Distribution System (MIDS)
- Multiple Platform - Common Data Link (MP-CDL)
- NAVSTAR GPS User Equipment (UE)
- Navy Marine Corps Intranet (NMCI)
- Navy Standard Integrated Personnel System (NSIPS)
- Public Key Infrastructure (PKI)
- Reserve Component Automation System (RCAS)
- Tactical Aircraft Mission Planning System (TAMPS)
- Theater Medical Information Program (TMIP)
- Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II)
- Warfighter Information Network – Terrestrial (WIN-T)

Strategic Warfare and Space Systems Programs:

- Advanced EHF (AEHF)
- Advanced Wide Band System

- MDA Program
- Evolved Expendable Launch Vehicle (EELV)
- Global Broadcast System (GBS)
- Ground Based Midcourse Defense Segment
- Medium Extended Air Defense System (MEADS)
- Minuteman III Guidance Replacement Program (GRP) Phase I
- Minuteman III Propulsion Replacement Program (PRP)
- Mobile User Objective System (MUOS)
- Multi-Platform Radar Technology Insertion Program (MP-RTIP)
- National Airspace System (NAS)
- National Polar-Orbiting Operational Environment Satellite (NPOESS)
- Navy EHF SATCOM Program (NESP)
- Patriot Advanced Capability-3 (PAC-3) Missile
- Sea Based Midcourse Defense Segment
- Space-Based Infrared System-High (SBIRS-H)
- Space-Based Infrared System-Low (SBIRS-L)
- Space-Based Laser
- Tactical Tomahawk Mission Planning System / Tomahawk Command & Control System (MPS/TCCS)
- Teleport
- Theater High-Altitude Area Defense (THAAD) / GBR
- Titan IV
- Trident II Missile
- Ultra High Frequency (UHF) Follow-on Satellite
- Wideband Gapfiller Satellite (WGS)
- YAL-1 Airborne Laser (ABL)

Information Assurance and Interoperability Evaluations:

- Will continue to execute and expand this effort. Specific goals include execution of enhanced Red Teaming in major exercises for each Service and the Combatant Commands.

Official Travel:

- Will perform official travel to carry out oversight of the OT&E of the DoDs weapons systems.

FY 2005 Plans: Key elements of DOT&E's oversight authority, as described under MISSION ACCOMPLISHMENT AND BUDGET ITEM JUSTIFICATION, will be conducted, as applicable, for the following programs:

Land Warfare Programs:

- Abrams Tank Upgrade
- Advanced Field Artillery Tactical Data System (AFATDS)
- Aerial Common Sensor (ACS)
- AN/TPQ-47 Counterfire Radar
- Army Tactical Missile System Block II / Brilliant Anti-Armor (ATACMS/BAT) and ATACMS Block II / P3I BAT
- Artemis (Chemical Agent Standoff Detection System)
- Battlefield Command Information System (BCIS)
- Bradley Upgrade
- CH-47F Cargo Helicopter Upgrade
- Chemical Biological Defense Program (includes Artemis, JBAIDS, JBPDS, JBSDS, JCAD, JSFDS, JSLNBCR, JSLSCAD, JSSED, JWARN)
- Chemical Demilitarization
- Comanche (RAH-66) (includes 20mm Ammunition)
- Common Missile
- Distributed Common Ground System (DCGS) - ARMY
- Excalibur (155mm Round)
- Family of Medium Tactical Vehicles (FMTV)
- Future Combat System (includes manned and unmanned ground vehicles, unmanned air vehicles)
- Future Scout/Cavalry System
- Guided Multiple Launch Rocket System (GMLRS)
- High Mobility Artillery Rocket System (HIMARS)
- Javelin Anti-tank Missile
- Joint Warning & Reporting Network
- Kiowa Warrior (OH-58D)
- Land Warrior
- Line-of-Sight Anti-Tank Missile (LOSAT)
- Longbow Apache (AH-64D)
- Longbow Hellfire Missile (Upgrades/Modifications)
- Objective Crew Served Weapon System (OCSWS)
- Objective Individual Combat Weapon System (OICWS)
- Precision Guided Mortar Munitions (PGMM)
- Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)

- Sensor Fused Munition
- Single Channel Anti-Jam Man-Portable (SCAMP) (MILSTAR, Block II)
- Stinger Re-programmable Microprocessor Missile (RMP)
- Stryker Armored Vehicle
- Surface-Launched AMRAAM (SLAMRAAM)
- Tow-Fire & Forget Anti-tank Missile
- UH-60M Black Hawk - All Upgrades

Naval Warfare Programs:

- Acoustic Rapid COTS Insertion for SONAR
- Advanced Amphibious Assault Vehicle (AAAV) - Includes 30mm ammunition
- Advanced Seal Delivery System (ASDS)
- Airborne Mine Neutralization System / Rapid Airborne Mine Clearance System (AMNS/RAMICS)
- Amphibious Assasult - Dock (LPD-17) Ship Class - Includes 30mm ammunition
- Amphibious Helicopter - Assault (Replacement) (LHA(R)) Ship Class
- Amphibious Helicopter - Dock (LHD) Ship Class
- AN/SPY-1 B/D (All Versions)
- Auxiliary Cargo / Ammunition Ship Class (T-AKE)
- Cobra Judy Replacement – Ship-based Radar System
- Cooperative Engagement Capability (CEC)
- Cruiser Conversion
- CVN (X) Class
- CVN 68 Nimitz Class
- DD(X) land attack destroyer
- DDG-51 Destroyer (All Variants)
- EA-18G (electronic variant of F/A-18)
- Evolved Sea Sparrow Missile (ESSM)
- Extended Range Active Missile
- Extended Range Guided Munition (ERGM)
- Fixed Distributed System / Advanced Deployable System (FDS/ADS)
- HyFly
- Integrated Surface Ship ASW Combat System (AN/SQQ-89)
- Joint Command and Control Capability (JCC(X)) Ship Class
- Littoral Combat Ship (LCS)

- Maritime Prepositioning Force (Future)
- MH-60R Helicopter
- MH-60S Helicopter
- MK-48 MODS ADCAP Torpedo
- Naval Integrated Fire Control-Counter Air (NIFC-CA)
- Rolling Airframe Missile (RAM)SSGN Trident Class Conversion
- Ship Self Defense System (SSDS)
- SSN-21 Seawolf / AN/BSY-2
- SSN-23 Jimmy Carter
- SSN-774 Virginia CLASS
- Standard Missile-2 (SM-2) (Blocks I/II/III/IV)
- Strategic Sealift Program (SSP) Ship Class
- SUB COMMS (SubECS)
- Surveillance Towed Array Sensor System (SURTASS) / Low Frequency Active (LFA)
- Tactical Control System (TCS)
- Tactical Tomahawk Missile
- T-AOE(X) Triple Product Station Ship

Air Warfare Programs:

- Active Electronically Scanned Array (AESA)
- Advanced Medium Range Air-to-Air Missile (AMRAAM)
- AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)
- AIM-9X Missile
- Air Early Warning (AEW)
- B-1B Lancer Conventional Munitions Upgrade Program (CMUP)
- B-2 Radar Pathfinder Program (B-2 RPP)
- B-2A Spirit Stealth Bomber
- C-130 Avionics Modernization Program (AMP)
- C-130J All Variants (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
- C-17 Aircraft
- C-5 Avionics Modernization Program (AMP)
- C-5 Reliability & Reengineering Program
- Combat Search and Rescue Replacement
- Combat Survivor/Evader Locator

- F/A-18 E/F Hornet
- F-22 Fighter
- Global Hawk High Altitude Endurance UAV (HAEUAV)
- Joint Air-to-Surface Strike Missile (JASSM)
- Joint Direct Attack Munition (JDAM)
- Joint Helmet Mounted Cueing System
- Joint Primary Aircraft Training System (JPATS)
- Joint Standoff Weapon (JSOW) Baseline
- Joint Standoff Weapon (JSOW) BLU-108
- Joint Standoff Weapon (JSOW) Unitary
- Joint Strike Fighter (JSF)
- Joint Surveillance Target Attack Radar System (JSTARS)
- KC-135 Global Air Traffic Management (GATM) Upgrade
- KC-767 Aerial Tanker Aircraft
- Multi-Mission Maritime Aircraft (MMA)
- Predator UAV (RQ/MQ-1, MQ-9)
- Sensor Fuzed Weapon (SFW) P3I (CBU-97/B)
- Small Diameter Bomb
- Standoff Land Attack Missile – Expanded Response (SLAM-ER)
- UCAV (Air Force)
- UCAV (Navy)
- USMC H1 Upgrade
- V-22 Osprey
- Vertical Take-Off UAV (VTUAV)

Electronic Warfare Programs:

- Advanced Threat IR Countermeasure/Common Missile Warning System (ATIRCM/CMWS)
- AN/AAR-47 V2 Upgrade Missile/laser Warning Receiver
- AN/ALR-56 (All Versions) Radar Warning Receiver-All Upgrades
- AN/ALR-67 (All Versions)-includes AN/ALR-67(V)
- AN/ALR-69 Radar Warning Receiver
- AN/APR-39A V2 Radar Warning Receiver
- EA-6B Improved Capabilities (ICAP) III & Multiple Upgrades
- F-15 Tactical Electronic Warfare System (TEWS) including AN/ALQ-135 Band 1.5 Fiber-Optic Towed Decoy

- Integrated Defensive Electronic Countermeasures (IDECM)
- Large Aircraft IRCM (LAIRCM)
- Suite of Integrated Radio Frequency Countermeasures (SIRFC)
- Surface Electronic Warfare Improvement Program (SEWIP)

Command, Control, Communications, and Intelligence Programs:

- Advanced Field Artillery Tactical Data System (AFATDS)/ Army Battle Command System (ABCS)
- Air and Missile Defense Planning and Control System (AMDPCS)
- Air Force Mission Support System (AFMSS)
- All Source Analysis System (ASAS) (ABCS)
- Army Global Command and Contrail System (AGCCS)
- Broad Area Maritime Surveillance (BAMS)
- Business Systems Modernization (BSM)
- Combat Service Support Control System (CSSCS)/ABCS
- Composite Health Care System II (CHCS II)
- Corporate Executive Information System (CEIS)
- Defense Civilian Personnel Data System (DCPDS)
- Defense Integrated Military Human Resources System (DIMHRS)
- Defense Joint Accounting System (DJAS)
- Defense Medical Logistics Standard Support (DMLSS)
- Defense Message System (DMS)
- Defense Procurement Payment System (DPPS)
- DFAS Corporate Database/Warehouse (DCD/DCW)
- Distributed Common Ground System - Air Force (DCGS-AF)
- E-2C Hawkeye Airborne Early Warning
- E-3A Airborne Warning and Control System (AWACS) Radar System Improvement Program (RISP)
- Force XXI Battle Command Brigade and Below (FBCB2)
- Forward Area Air Defense Command Control Communications and Intelligence System (FAAD C3I)/ABCS
- Fuels Automated System (FAS)
- Global Command and Control System (GCCS) – Joint
- Global Command and Control System (GCCS) – Maritime
- Global Command and Control System -Air Force (GCCS-AF)
- Global Command Support System -Air Force (GCSS-AF)
- Global Transportation Network (GTN-21)

- Integrated Logistics System-Supply (ILS-S)
- Integrated Maintenance Data System (IMDS)
- Integrated System Control (ISYSCON)/Tactical Internet Manager (TIMS)
- Joint Computer Aided Acquisition and Logistics Support (JCALS)
- Joint Mission Planning System (JMPS)
- Joint Precision Approach and Landing System (JPALS)
- Joint Simulation System (JSIMS)/Warfighter Simulation (WARSIM)
- Joint Tactical Radio System Cluster 1
- Joint Tactical Radio Waveforms
- Maneuver Control System (MCS)/ABCS
- Multifunctional Information Distribution System (MIDS)
- Multiple Platform - Common Data Link (MP-CDL)
- NAVSTAR GPS User Equipment (UE)
- Navy Marine Corps Intranet (NMCI)
- Navy Standard Integrated Personnel System (NSIPS)
- Public Key Infrastructure (PKI)
- Reserve Component Automation System (RCAS)
- Tactical Aircraft Mission Planning System (TAMPS)
- Theater Medical Information Program (TMIP)
- Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II)
- Warfighter Information Network – Terrestrial (WIN-T)

Strategic Warfare and Space Systems Programs:

- Advanced EHF (AEHF)
- Advanced Wide Band System
- Evolved Expendable Launch Vehicle (EELV)
- Global Broadcast System (GBS)
- Ground Based Midcourse Defense Segment
- MDA Program
- Medium Extended Air Defense System (MEADS)
- Minuteman III Guidance Replacement Program (GRP) Phase I
- Minuteman III Propulsion Replacement Program (PRP)
- Mobile User Objective System (MUOS)
- Multi-Platform Radar Technology Insertion Program (MP-RTIP)

- National Airspace System (NAS)
- National Polar-Orbiting Operational Environment Satellite (NPOESS)
- Navy EHF SATCOM Program (NESP)
- Patriot Advanced Capability-3 (PAC-3) Missile
- Sea Based Midcourse Defense Segment
- Space-Based Infrared System-High (SBIRS-H)
- Space-Based Infrared System-Low (SBIRS-L)
- Space-Based Laser
- Tactical Tomahawk Mission Planning System / Tomahawk Command & Control System (MPS/TCCS)
- Teleport
- Theater High-Altitude Area Defense (THAAD) / GBR
- Titan IV
- Trident II Missile
- Ultra High Frequency (UHF) Follow-on Satellite
- Wideband Gapfiller Satellite (WGS)
- YAL-1 Airborne Laser (ABL)

Information Assurance and Interoperability Evaluations:

- Will continue to execute and expand this effort. Specific goals include execution of enhanced Red Teaming in major exercises for each Service and all of the Combatant Commands.

Official Travel:

- Will perform official travel to carry out oversight of the OT&E of the DoDs weapons systems.

B. (U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2003	FY 2004	FY 2005
FY 2004 President's Budget	26.758	37.323	42.390
Current Budget Submit	27.472	37.006	42.390
Total Adjustments	0.714	(0.317)	
Congressional Program Reductions		(0.317)	
Congressional Rescissions			
Congressional Increases			
Reprogramming	0.714 [1]		

Notes:

1. **Reprogramming from 0605804D to PE 0605118D**

C. (U) OTHER PROGRAM FUNDING NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)				February 2004			
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX				LIVE FIRE TESTING (LFT) PROGRAM ELEMENT (PE) 0605131D8Z			
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PE 0605131D	15.791	11.721	10.209	10.390	10.546	10.759	10.958

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

This PE directly supports the Congressional statutory requirements for oversight of Live Fire Test and Evaluation (LFT&E). The primary objective of LFT&E is to assure that the vulnerability and survivability of Department of Defense (DoD) crew-carrying weapons platforms and the lethality of our conventional munitions are known and acceptable before entering full-rate production. LFT&E encompasses realistic tests involving actual U.S. and threat hardware or, if not available, acceptable surrogate threat hardware. The objective is to identify and correct design deficiencies early in the development process, and is required to be completed before weapons programs proceed beyond low-rate initial production. It also includes realistic modeling and simulation (M&S), to include pretest predictions, to assure the maximum benefit from the testing. The LFT&E program is essential, especially in view of the escalating costs of technologically sophisticated weapons systems.

The LFT PE also supports the DoD's Joint Live Fire (JLF) Program. JLF was begun in 1984 under an OSD charter to test fielded front-line U.S. and threat combat aircraft and armor systems for their vulnerabilities and fielded weapons, both U.S. and threat, for their lethalities against their respective targets. The Congress, seeing the vulnerability and lethality issues raised by the JLF program, decided that there must be legislation to require that this realistic testing be done on new systems before they reach the field. Hence the LFT Legislation, U.S. Code, Title 10, Section 2366 was passed in 1987.

In the FY 1997 DoD Appropriations Act, the Congress appropriated an initial $3.0M for the Live Fire Testing and Training (LFT&T) program, formalizing an important LFT&E program relationship. The funding strengthens the natural relationship between LFT activities and the modeling and simulation technologies being developed to support the Services' testing and training activities. Through FY 2004 Congress added a total of $33.0M to fund projects under the LFT&T initiative. In FY 2003, the Congress added $1.8M to continue the augmented reality based fire fighting trainer program, the concept for which was demonstrated under LFT&T.

This Research Category 6.5 PE supports LFT&E management activities for the oversight of RDT&E of new systems, as well as RDT&E of fielded systems. It also includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, as well as funds to perform official travel in support of its activities.

Program Accomplishments and Plans:

FY 2003 Accomplishments:

Major T&E Programs:

- Worked with Services, providing oversight of Live Fire Test and Evaluation activities on:
  - Advanced Medium Air-to-Air Missile (AMRAAM)
  - Air Force Tanker Replacement Program
  - B-1B Lancer Conventional Mission Upgrade Program (CMUP)
  - C-5 Reliability and Reengineering Program
  - C-17 Globemaster III Advanced Cargo Aircraft
  - C-130 Avionics Modernization Program
  - C-130J Hercules Cargo Aircraft
  - Combat Search and Rescue (CSAR) replacement
  - F/A-22 Raptor
  - Joint Air-Surface Standoff Missile (JASSM)
  - Small Diameter Bomb (SDB)
  - Abrams Tank Upgrade
  - Blackhawk (UH-60M) Upgrade
  - Bradley Fighting Vehicle System Upgrade
  - CH-47F Improved Cargo Helicopter Upgrade
  - RAH-66 Comanche Reconnaissance Attack Helicopter
  - Common Missile
  - Crusader
  - Excalibur (155mm round)
  - Future Combat System
  - Guided Multiple Launch Rocket System
  - Javelin Advanced Anti-tank Weapon System
  - OH-58D Kiowa Warrior

- Line-of-Sight Anti-Tank (LOSAT) Missile
- AH-64D Longbow Apache
- Longbow Hellfire Missile
- M829E3 120mm round
- Objective Crew Served Weapon System (OCSWS), XM307
- Objective Individual Combat Weapon System (OICWS)
- Patriot Advanced Capability 3 (PAC-3)
- Precision Guided Mortar Munitions
- Sensor Fuzed Munition
- Stinger Reprogrammable Microprocessor (RMP) Missile
- Stryker Armored Vehicle
- Surface Launched AMRAAM (SLAMRAAM)
- Advanced Amphibious Assault Vehicle (AAAV)
- Advanced Seal Delivery System (ASDS)
- AIM-9X Sidewinder Upgrade
- Airborne Mine Neutralization System (AMNS)
- Cruiser Conversion
- CVN(X) Next Generations Nuclear Attack Carrier Ship Class
- DDG-51 Guided Missile Destroyer
- DD(X) Future Surface Combatant Program
- E/A-18G
- Evolved Sea Sparrow Missile (ESSM)
- Extended Range Active Missile (ERAM)
- Extended Range Guided Munition (ERGM)
- F/A-18E/F Hornet Naval Strike Fighter
- F 35 Joint Strike Fighter
- Joint Maritime Command and Control Capability (JCC(X)) Ship Class
- Joint Standoff Weapon (JSOW) (Baseline, BLU-108, and Unitary variants)
- KC-130J aircraft
- LHA(R) New Amphibious Assault Ship
- LHD1 Amphibious Assault Ship
- Littoral Combatant Ship

- LPD-17 Amphibious Assault Ship
- MH-60R Multi-mission Helicopter
- MH-60S Utility Helicopters
- MK-48 ADCAP torpedo
- Multi-mission Maritime Aircraft (MMA)
- Maritime Prepositioning Force (Future)
- Naval Integrated Fire Control-Counter Air
- Rapid Airborne Mine Clearance System (RAMICS)
- Rolling Airframe Missile
- Surface Electronic Warfare Improvement Program
- SSGN Trident conversion
- SSN-21 SEAWOLF / AN/BSY-2
- SSN-23 JIMMY CARTER
- SSN-774 VIRGINIA Class
- Standoff Land Attack Missile-Expanded Response (SLAM-ER)
- Strategic Sealift Program (SSP) Ship Class
- T-AKE LEWIS & CLARK Class of Auxiliary Dry Cargo Ships
- T-AOE(X) Triple Product Station Ships
- Tactical Tomahawk Missile
- USMC H-1 Upgrades (4BW/4BN)
- V-22 Osprey Joint Advanced Vertical Lift Aircraft
- VXX Presidential Replacement Helicopter Program
- Ballistic Missile Defense Program

JLF Programs:

- Completed tests of the:
  - CH-47D Main Rotor Blade
  - AH-1 Vulnerability to Rocket Propelled Grenades
  - H-60 Tail Rotor Subsystem Ballistic Vulnerability
  - H-60 Engine Nacelle Ballistic Fire Suppression system
  - CH-53 Vulnerability to AAA
  - Predator wing
  - Vulnerability of externally stored explosives

- Lethality tests against the GEODE target
- Vulnerability of Propellants
- Lethality of Explosive Formed Penetrators against Titanium armor
- Flammability Hazards aboard ships/submarines
- Weapons induced flashover

LFT&T:

- Continued efforts started in prior years on following projects:
  - Special Operations Forces Signals Training and Rehearsal System
  - Moving Weapons Platform Simulator
  - Joint Distributed Integrated Test and Training System
  - Multipurpose Terminal Control and Supporting Arms Trainer
- Initiated following projects:
  - Project Grace
  - Super Fast Assessment Strike Tool—Collateral Damage
  - Advanced Robotics Testbed
  - Objective Individual Combat Weapon Embedded Simulation, Training, and Instrumentation

Reality Fire Fighting / Homeland Security:

- Provided for further development, implementation of training system upgrades, and installation of two augmented reality based damage control and training systems. One system was installed at the Center for Naval Engineering, San Diego, and the other is to be installed at the New Hampshire Fire Academy.

Official Travel:

- Performed official travel to carry out oversight of LFT&E programs.

FY 2004 Plans:

Major T&E Programs:

- Work with Services, providing oversight of Live Fire Test and Evaluation activities on:
  - C-5 Reliability and Reengineering Program
  - C-17 Globemaster III Advanced Cargo Aircraft
  - C-130 Avionics Modernization Program
  - C-130J Hercules Cargo Aircraft
  - F/A-22 Raptor
  - Joint Air-Surface Standoff Missile (JASSM)

- Personnel Recovery Vehicle
- Small Diameter Bomb (SDB)
- Abrams Tank Upgrade
- Army Tactical Missile System-Penetrator
- Army Theater Support Vessel
- Blackhawk (UH-60M) Upgrades
- Bradley Fighting Vehicle System Upgrade
- CH-47F Improved Cargo Helicopter Upgrade
- RAH-66 Comanche Reconnaissance Attack Helicopter
- Excalibur (Family of Precision 155mm projectiles)
- Future Combat System
- Guided Multiple Launch Rocket System
- Joint Common Missile
- OH-58D Kiowa Warrior
- Line-of-Sight Anti-Tank (LOSAT) Missile
- AH-64D Longbow Apache
- Longbow Hellfire Missile
- Medium Extended Air Defense System
- Mid Range Munitions
- Patriot Advanced Capability 3 (PAC-3)
- Precision Guided Mortar Munitions
- Stryker Armored Vehicle
- Surface Launched AMRAAM (SLAMRAAM)
- XM8 Lightweight Modular Weapon System
- XM29 Integrated Air Burst Weapon System
- XM307 Objective Crew Served Weapon System
- Advanced Seal Delivery System (ASDS)
- Affordable Weapon System
- AIM-9X Sidewinder Upgrade
- Airborne Mine Neutralization System (AMNS)
- AN/WSQ-11 Countermeasure Anti-Torpedo
- CH-53X Upgrade Program

- Cruiser Conversion
- CVN-21 Next Generations Nuclear Attack Carrier Ship Class
- DDG-51 Guided Missile Destroyer
- DD(X) Future Surface Combatant
- E/A-18G (electronic variant of F/A-18)
- Expeditionary Fighting Vehicle
- Evolved Sea Sparrow Missile (ESSM)
- Extended Range Active Missile (ERAM)
- Extended Range Guided Munition (ERGM)
- F 35 Joint Strike Fighter
- Joint Standoff Weapon (JSOW) (Baseline, BLU-108, and Unitary variants)
- KC-130J aircraft
- Long Range Land Attack Projectile
- LHA(R) New Amphibious Assault Ship
- LHD 8 Amphibious Assault Ship
- Littoral Combatant Ship
- LPD-17 Amphibious Transport Dock
- MH-60R Multi-mission Helicopter Upgrade
- MH-60S Utility Helicopters
- MK-48 ADCAP torpedo
- Multi-mission Maritime Aircraft (MMA)
- Maritime Prepositioning Force (Future)
- Naval Integrated Fire Control-Counter Air
- Rapid Airborne Mine Clearance System (RAMICS)
- Rolling Airframe Missile
- Surface Electronic Warfare Improvement Program
- SSGN OHIO Class conversion
- SSN-21 SEAWOLF / AN/BSY-2
- SSN-23 JIMMY CARTER
- SSN-774 VIRGINIA Class Submarine
- Strategic Sealift Program (SSP) Ship Class
- T-AKE LEWIS & CLARK Class of Auxiliary Dry Cargo Ships

- T-AOE(X) Triple Product Station Ships
- Tactical Tomahawk Missile
- USMC H-1 Upgrades (4BW/4BN)
- VXX Presidential Replacement Helicopter Program
- Ballistic Missile Defense Program

JLF Programs:

- Conduct tests of the:
  - AH-1 Vulnerability to Rocket Propelled Grenades
  - H-60 Engine Nacelle Ballistic Fire Suppression system
  - CH-53 Vulnerability to AAA
  - Vulnerability of Close Air Support aircraft to 35mm Air Burst Munition
  - Predator Systems Vulnerability
  - Chinook Fuel Feed Plumbing Armor
  - CF-6 Engine Vulnerability to MANPADS
  - UH/MH-60 Dry Bay Foam
  - Run Dry capability/Ballistic Vulnerability of UH/MH-60 Improved Gear Box
  - Joint Common Missile support against the GEODE target
  - Vulnerability of Propellants
  - Vulnerability of Lithium-Ion Battery Packs
  - Blast Effects for Comanche
  - Effects of Low Speed Rod penetration
  - Effects of Large Fragment penetration
  - Effects of High Obliquity Impact penetration
  - Shipboard Fire Hazards
  - Ship Shock testing using smaller charges

LFT&T:

- Provide for the orderly termination of all projects started in prior years due to insufficient funding.

Reality Fire Fighting Training:

- Provide for further improvements, implementation of training system upgrades, and installation of augmented reality based damage control and training systems.

Official Travel:
- Perform official travel to carry out oversight of LFT&E program.

FY 2005 Plans:

Major T&E Programs:
- Complete LFT&E technical assessments for those systems approaching due dates for reporting to Congress
- Continue oversight of continuing lethality and vulnerability efforts on acquisition programs

JLF Programs:
- Conduct tests of fielded systems not previously tested under Air, Land, or Sea Joint Live Fire programs
- Continue tests of foreign systems acquired for exploitation
- Continue to evaluate foreign targets and munitions
- Continue to invest in development of technologies that increase test realism
- Continue to improve data base management tools

Official Travel:
- Perform official travel to carry out oversight of LFT&E program.

B. (U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2003	FY 2004	FY 2005
FY 2004 President's Budget	15.791	10.074	10.209
Current Budget Submit	15.791	11.721	10.209
Total Adjustments		1.647	
Congressional Program Reductions		(0.153)	
Congressional Rescissions			
Congressional Increases			
Reality Fire Fighting		1.800	

C. (U) OTHER PROGRAM FUNDING NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)			February 2004				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX			DEVELOPMENT TEST AND EVALUATION (DT&E) PROGRAM ELEMENT (PE) 0605804D8Z				
$'s in Millions	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
PE 0605804D	63.426	104.381*	112.679*	114.748*	117.325*	119.595*	122.844*

*Includes transfer of funds for JT&E transferred from PE 0605804D8Z in the RDT&E Defense-Wide Appropriation 0400 to PE 0605804D8Z in the OT&E,D Appropriation 0460

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.

The T&E programs are continuing efforts that provide management and oversight of DoD T&E functions and T&E expertise to the DoD. T&E Programs now consist of five activities: Joint Test and Evaluation (JT&E), Threat Systems (TS); Center for Countermeasures (CCM), Joint Technical Coordinating Group on Munitions Effectiveness (JTCG/ME) and Joint Aircraft Survivability Program (JASP). The Department transferred the JT&E program from the Under Secretary of Defense (Acquisition, Technology and Logistics) to the DOT&E effective 9 December 2002. Funding for JT&E remained in Appropriation 0400 through FY 2003 and moved to Appropriation 0460 starting in FY 2004.

JT&E programs are process, rather than product, focused T&E activities conducted in a joint military environment. These multi-Service programs, chartered by OSD and coordinated with the Joint Staff and Services, provide improvements in interoperability of Service systems, improvements in technical and operational concepts, solutions to joint operational issues, development and validation of joint test methodologies, and data for validating models, simulations and test beds. JT&E programs solve relevant warfighter issues in a joint T&E environment, develop and improve Joint Test Capabilities and Methodologies.

TS provides OSD policy and oversight to Component 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 Joint Service Countermeasure (CM) T&E Center, conducts analysis, T&E, and assessment of U.S. and Foreign Electro-Optical (EO), Infrared (IR), and Millimeterwave (MMW) precision guided weapons (PGW) and systems, countermeasures, counter-countermeasures, and warning devices for the Services, T&E Agencies, the Intelligence Community, and Homeland Defense. CCMs staff and the CM knowledge base developed over 30 years provide the DoD acquisition community and the warfighting Combatant Commanders with the information and expertise necessary to ensure the survival of U.S. forces on the increasingly hostile modern battlefield.

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 (JMEMs)) on all US major non-nuclear weapons. The JTCG/ME, under the auspices of the JLCs, authenticates weapons effectiveness data for use in training, systems acquisition, weaponeering, 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. Based on Lessons Learned from recent operations (Southern/Northern Watch, Enduring Freedom, Iraqi Freedom), the Combatant Commands (COCOMs) and Services identified that JMEM data and methodology voids exist due to new weapon systems, evolving target sets and a more stringent operating environment. As a result of Joint Staff J8 review and endorsement, the DoD increased the JTCG/ME budget to correct these deficiencies. The FY 2005-09 plus-up will develop target geometry models (e.g., surface mobile/fixed, air, hard/deeply buried and ship targets) and vulnerability data. These data will be combined with weapons characteristics, delivery accuracies and methodology enhancements to produce effectiveness indices for the specific weapon-target pairings identified by the COCOMs and Services. JASP and JTCG/ME co-chair the Survivability/Vulnerability Information Analysis Center (SURVIAC) Technical Coordinating Group (TCG).

The Joint Logistics Commanders (JLC) originally chartered the JASP in 1971 to serve as DoD's focal point for the joint service community to enhance the non-nuclear combat survivability of aircraft. The Tri-Service Joint Aeronautical Commanders Group (JACG) rechartered this program, which acts as the DoD focal point for aircraft susceptibility and vulnerability reduction research as well as survivability modeling and simulation (M&S) methodology. The JASP is the Executive Agent for the Joint Live Fire

Aircraft Program managed by the Live Fire Test office of the Director, Operational Test & Evaluation (DOT&E). The JASP also develops and standardizes methodologies for the evaluation of aircraft survivability (susceptibility and vulnerability) to threat weapons.

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 test and evaluation policies, infrastructure and resources, including stewardship of the Major Range and Test Facility Base (MRTFB) and transformation of test methods and infrastructure to ensure that future defense systems provide necessary Joint Warfighting capabilities. 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 the DOT&E mission. Especially important are a series of studies and policy efforts, collectively labeled sustainable range management, that address encroachment, use of RF spectrum, compliance with environmental laws and regulations, and unexploded ordnance. The Defense Test and Evaluation Professional Institute (DTEPI) provides computer-based training and on-line web-based training to the DoD T&E community in technical T&E subjects.

Funds are used to perform official travel related to the activities within this program element.

This Research Category 6.5 PE supports management activities for the DOT&E oversight responsibility for T&E and the MRTFB.

Program Accomplishments and Plans:

FY 2003 Accomplishments:

T & E Programs

- JT&E:

  The JT&E discussion of FY 2003 accomplishments is also located in the RDT&E Defense-Wide Appropriation 0400 justification under Developmental Test and Evaluation PE 0605804D8Z.

  - Completed the Joint Close Air Support (JCAS) test which improved the operational effectiveness of joint U.S. forces conducting close air support (CAS). This improvement was accomplished by assessing current equipment, training, and joint employment doctrine for CAS operations. JCAS test products included Joint and Service publications changes and continuing support as a Joint Requirements Oversight Council (JROC) sponsored organization. USAF lead, USA, USN, and USMC participation.
  - Completed the Joint Shipboard Helicopter Integration Process (JSHIP) which developed a process for certification and integration of Army and Air Force helicopters on-board Navy ships to give joint force commanders information to enable

effective, efficient, and safe joint shipboard interoperability. JSHIP test products included the Joint Shipboard Helicopter Integration Planning Guidance and Procedures Document which provides the guidance for certification and integration of Army and Air Force helicopters to safely operate onboard Navy ships. Additionally, JSHIP developed an interactive Web and CD-based reference and training program for Army and Air Force units. USN lead, USA, USAF, and USMC participation.

- Continued the Joint Battle Damage Assessment (JBDA) test, which is developing and testing procedures to improve the accuracy and timeliness of BDA support at key points in the Joint Force Commander's decision making cycle. JBDA's focus is BDA reporting. Test products to the warfighter include C4I enhancements institutionalized in ADOCS and other C4I systems, a Commander's Handbook for joint BDA, and BDA training CDs for distribution to combatant customers. USA lead, USAF, USN, and USMC participation.
- Continued the Joint C2 Intelligence, Surveillance, and Reconnaissance (JC2ISR) test, which is developing products that will improve the Joint Task Force Commander's capability to locate high value, high payoff targets, and conduct combat assessment by improving joint command and control, intelligence, and reconnaissance sensor management tactics, techniques, and procedures; concept of operations; and training. Test products to the warfighter include Risk Analysis Tools & Handbook guidance for combatant command J6 staff and the Services for assessing mission risk. USAF lead, USA, USN, and USMC participation.
- Continued the Joint Cruise Missile Defense (JCMD) test, which is developing improvements to U.S. joint integrated air defense systems (JIADS) that will enhance their effectiveness against the threat of a cruise missile attack. JCMD will quantify the effects of procedural and hardware enhancements to JIADS in a cruise missile defense role and make recommendations for improvements to combatant commanders and the Services. JCMD test products include reference handbooks for combatant commanders and a rigorous testing methodology for cruise missile defense testing. USAF lead, USN, USA, and USMC participation.
- Continued the Joint Global Positioning System Combat Effectiveness (JGPSCE),
- Continued the Joint Logistics/Planning Enhancement (JLOG/PE) test, which is identifying logistics information and process enhancements to improve the accuracy of sustainment planning to in-theater forces. Test products to the warfighter include process improvements to Joint and Service logistics documents as well as training requirements. USA Lead. USMC participation.
- Continued the Joint Methodology to Assess C4ISR Architecture (JMACA) test, which is developing a set of tools to assess the Join Task Force integrated command, control, communications, and computers, intelligence, surveillance, and reconnaissance (C4ISR) architecture. JMACA is working closely with USJFCOM Joint Battle Management Command and Control (JBMC2) office to transition the JMACA Methodology as their standard C4ISR interoperability tool. USN Lead. USA participation.
- Continued the Joint UAV for Time Sensitive Operations (JUAV-TSO) test, which is developing joint, platform independent tactics, techniques, and procedures for unmanned aerial vehicle (UAV) employment to support warfighters

performing time-sensitive air interdiction, fire support, and personnel recovery missions. USN Lead. USAF and USA participation.

- Continued the Joint Data Link Information Combat Execution (JDICE) test, which is developing test solutions to shortfalls in tactical datalink information exchange capabilities across sensor, command and control, and "shooter" datalink capable networks as documented by Combatant commanders' during combat operations in Kosovo and Afghanistan. USAF Lead.
- Initiated the Joint Space Control Operations (Negation) (JSCO(N)) Joint Feasibility Study focused on the "deny" portion of the space control mission area. If chartered, they are planning to test and evaluate the Joint Force Commander's Command and Control (C2) processes and Joint Tactics, Techniques, and Procedures (JTTPs) used to employ space control negation effects against an adversary's space capabilities. Current target planning and assessment capabilities will be baselined to identify potential improvements to these processes for the Joint warfighter. Expected test products, will update Joint Publications and Transformation Change Proposals (TCPs) submitted through USJFCOM with Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF) recommendations. USAF lead.
- Initiated the Joint Integration and Interoperability of Special Operations (JIISO) Joint Feasibility Study proposing to test and improve the integration and interoperability of Special Operations Forces (SOF) and Conventional Forces (CF) mission planning and execution capabilities in support of joint missions. This test will evaluate current and enhanced Joint Tactics, Techniques, and Procedures (JTTPs) and supporting information environments (IE) used to plan and execute these types of tactical missions. Expected test products, if chartered, will update Joint Publications, operational process models, and Transformation Change Proposals (TCPs) submitted through USJFCOM with DOTMLPF recommendations. USSOCOM lead.
- Initiated the Joint Urban Fires and Effects (JUFE) Joint Feasibility Study proposing to analyze current joint doctrine, equipment, organizations, and training to develop more efficient means to prosecute joint fires in urban terrain. The test will evaluate current Joint Tactics, Techniques, and Procedures (JTTPs) and supporting C3I architectures used to plan and execute these tactical missions. Expected test products, if chartered, will update Joint publications and training requirements that focus on curriculum modifications to sufficiently cover urban fires considerations. USJFCOM lead.
- Initiated Joint Survivability (JSURV) as a short-term test to assess potential solutions and make recommendations to reduce tactical vehicle casualties in Operation Iraqi Freedom. JSURV is conducting a rapid analysis of the problem and will produce recommendations on TTP and/or materiel solutions to USCENTCOM and the Services to directly reduce US casualty rates in Iraq. US Army lead, USMC and USAF participation.

- Threat Systems:
  - Simulators
    - Completed initiation of 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

- Completed the design of tool sets, creation of methodologies, and production operational standards for measures of effectiveness and interoperability testing of the test cases
- Completed collaborative efforts to provide support for interoperability testing in a realistic threat environment
- Continued the cooperative technical research and test bed projects to ensure threat representation (e.g., UV Calibration and Verification System Distribution Study, IR MANPADS Endgame Methodology, Dynamic Clutter Modeling for Radar Environment Simulator, and End-to-End Requirements Study (E2E)) adequacy for T&E
- Continued threat support to T&E through investigations of current scientific and technical intelligence information for insertion in Service threat representation modeling programs (e.g., Laser Beam Rider Simulator Integration, IR SAM Design of Experiments, High Fidelity Early Warning Sensor Modeling, and Infrared Missile Plume Signature)
- Continued oversight of Service threat simulators and threat digital models
- Continued to provide the tools to exchange the latest scientific and technological information between T&E and intelligence communities (e.g., Project Lusty - MiG Live Fire Evaluation, and Tests Event Model (TEM))
- Executed the DoD validation program for threat simulators and threat digital models
- Initiated technical investigations to identify solutions for effectively representing asymmetric threats to include Chemical, Biological, Radiological, and Nuclear (CBRN); Information Warfare (IW); and terrorism-related threats to Homeland Defense in testing of U.S. weapons systems
- Provided oversight of Service activities in support of the DoD validation program for Service threat simulators and threat digital models
- Provided threat assessment for DOT&E planning and evaluation
- Updated the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community

- Targets
  - Completed initiation of 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
  - Completed the design of tool sets, creation of methodologies, and production operational standards for measures of effectiveness and interoperability testing of the test cases
  - Completed collaborative efforts to provide support for interoperability testing in a realistic threat environment
  - Continued oversight of Service threat representative target programs
  - Provided OSD seed funds to prototype solutions to highest priority deficiencies in current target systems (e.g., Threat 'D' Study, Interferometric Inverse Synthetic Aperture Radar (IFISAR) --3-D Radar, Low Earth Orbit Satellite Target Control System (LEOS TCS)), and Rocket Assisted Take Off (RATO) Technology

- Provided oversight of the Service activities in support of the DoD validation program for Service threat representative targets
- Supported the implementation of new target modeling and simulation capabilities /tools that meet multi-Service T&E needs within common/DoD standard architectures (e.g., Subscale Aerial Target (SSAT) IR Countermeasures, Mobile Acoustic Source, Advanced Off Board Countermeasures, Subscale Aerial Target (SSAT) IR Signature Augmentation, Derived Radar Altitude Penetration Enhancement (DRAPE), and Decoy and Countermeasures)

- Center for Countermeasures:
  - CCM tested, analyzed, reported, and assessed over 40 US and foreign PGW systems/components, countermeasures, and threat-warning systems and other activities and programs, as listed below:
  - Air Force:
    - HH-60G Self Protection System (SPS), Air National Guard Air Force Reserve Test Center (AATC) Comet, Advanced Strategic and Tactical Expendables (ASTE), A-10/F-16 Force Development Evaluation (FDE), CV-22, LAZARUS, BLADES, and Joint Precision Autonomous Landing System (JPALS)
  - Army:
    - Comanche Defensive Suite, XM-982 Excalibur, Joint Common Missile, Hellfire and Hellfire II, Longbow Apache, and VVR-3 and AVR-2B warning receivers
  - Navy/Marines:
    - Vertical Take-Off Unmanned Aerial Vehicle (VTUAV), Advanced Targeting Forward Looking Infrared (ATFLIR), SHIELDS/IEWS, ERGM, Kinematic Flare development, MV-22, Advanced 6” Expendable (A6E), Shipboard Laser Acquisition System (SBLAS), and Joint Standoff Weapon (JSOW)
  - Foreign:
    - Foreign Rangefinder Exploitation Evaluation (FREE) G series, Night Attack Vision Exploitation(NAVE) G series, Foreign Laser Beamrider (FLBR), Foreign Laser Guided Projectiles(FLGP), WHEAT SPEAR, Foreign Active Protection System (FAPS) II, and Foreign Global Positioning System (FGPS)
  - M&S:

    MV and CV-22
    - Airborne Laser (ABL) platform study
    - Laser beamrider digital simulation development
    - US and Foreign additions to flare simulation data base
  - Other:
    - Operation Iraqi Freedom support to multiple Services
    - The Technical Cooperation Program (TTCP), NATO Trial EMBOW

- Provided CM inputs for evolving programs, identified by the Service Acquisition PEOs/PMs
- CM Warfare Initiative:
  - Coordinated CM Warfare support at the Combatant Command and MAJCOM levels
  - Marine Aviation Weapons and Tactics (MAWTS)-1 training support
  - Provided inputs on EO/IR CM training and equipment and Joint Interoperability Tasks to establish requirements and objectives for operational exercises and simulations
  - Developed software modifications to simulations to reflect EO/IR countermeasures scenarios at the Joint and Component Service level (JCATS, JSIMS, and CASTFOREM)
  - Participated in operational warfighting exercise of the STRYKER Brigade
- Continued to provide technical and analytical expertise in support of DOT&E
- Provided significant contributions to the Joint Man Portable Air Defense Systems (MANPADS) study
- Began measurement and assessment support of the Navy-led Joint Air Transport Measurement (ATM)

- JTCG/ME:
  - Completed conversion/updates of existing JMEMs to CD-ROM format for JMEM Air-to-Surface Weaponeering System (JAWS) v.2.2.3 and v.2.3, Joint Antiair Combat Effectiveness – Air Superiority (J-ACE: AS) v2.1, and JMEM/Surface-to-Surface Weapons Effectiveness System (JWES), v.2.1
  - Developed JMEM data for the most critical Combatant Command identified systems
  - Continued conversion/updates of existing JMEMs to CD-ROM format for Joint Antiair Combat Effectiveness – Air Defense (J-ACE: AD) v2.0
  - Reduced CD-ROM update cycles to a maximum of 14 months, and continued development of a strategy for target-oriented JMEMs
  - Distributed products and incremental updates via the classified internet with the Joint Product and Information Access System (JPIAS) (Books-on-line, Automated products, Models, Tri-Service Data, and Support service)
  - Reduced major methodology shortcomings (vulnerability/lethality, lethal areas/effectiveness indices, etc.)
  - Continued 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, bridges, buildings, multiple weapon types, real time delivery accuracy/Target Location Error (TLE), and dual stage warheads, helicopter-delivered munitions, and small boat weaponeering)
  - Conducted Configuration Management/Validation, Verification & Accreditation (VV&A) efforts on specific JTCG/ME models (i.e., Joint Services Endgame Model (JSEM), Advanced Joint Effectiveness Model (AJEM), Modular Effectiveness Vulnerability Assessments-Ground Fixed (MEVA-GF), Joint Mean Area Effects (JMAE), Operational Requirements-Based Casualty Assessment (ORCA), Modular UNIX TM-Based Vulnerability Estimation Suite (MUVES), and Advanced Survivability Assessment Program (ASAP)

- Released the Advanced Joint Effectiveness Model (AJEM) v2.1 (BRL-CAD 6.0, Updated GUI, improved penetration equations, New Encounter-V/L Interface, Improved Man-Portable Air Defense Systems (MANPADS), and LINUX port, ground-mobile documentation
- Conducted an Ad-hoc Working Group to develop a JMEM strategy/plan in support of the DoD High Energy Laser (HEL) program and the Joint Technology Office (JTO)
- Continued to work on red-on-blue effectiveness data and methodology with focus on STRATCOM requirements
- Continued to develop/sanitize JMEM products for foreign customers and coalition operations
- Continued execution and technical coordination efforts to address Target Vulnerability data generation (e.g., Special Operations) and methodology improvements (e.g., counter proliferation, fragment penetration, information operations, non-lethal weapons, blast effects, personnel casualty/ORCA extension, and target model generation)
- Continued Combatant Command data calls in support of FY 2004 program build requirements
- Continued to expand pilot programs for compliance with near-term acquisition programs to support JMEM production at system Initial Operational Capability (IOC)
- Maintained JTCG/ME intelligence requirements account through Defense Intelligence Agency COLISEUM system
- Assessed ability of JTCG/ME Program to support training requirements of operational users for weaponeering applications
- Initiated conversion/updates of existing JMEMs to CD-ROM format for Joint Antiair Combat Effectiveness – Air Superiority (J-ACE: AS) v3.0, and initiated configuration management for Target Vulnerability Data Management System (TVDMS) v2.3

- JASP:
  - Completed the bonded wing survivability project
  - Completed the dynamic loading methodology project
  - Completed the Improved Air Countermeasure with Ultra-fine Aluminum project
  - Completed the Man Portable Air Defense Weapon System (MANPADS) Impact Point assessment project
  - Completed the Advanced Low Altitude Radar Model (ALARM) Maintenance Project
  - Completed the Engine Damage Detection project
  - Completed the proof of concept for weapons bay protection process
  - Completed the Instant Firewalls project
  - Completed the Joint Service Surrogate seeker project
  - Completed the miniaturized countermeasures for Unmanned Air Vehicles (UAVs)
  - Completed the Tier II/III laser susceptibility project
  - Completed the Solid State Laser Pointer project
  - Completed the Susceptibility/Vulnerability to anti-helicopter mines project

- Completed the WINFIRE/ULLEX project
- Completed Advanced Joint Effectiveness Model (AJEM) Model Maintenance
- Completed the Component Vulnerability AnalysisArchive Project
- Completed the Aerogels for retrofitted increases in aircraft survivability project
- Completed the Extended Survivable Engine Control Demonstration (SECAD) Project
- Continued to support the SURVIAC Model Manager and Model Accreditation activities
- Continued to participate on the COVART/FASTGEN and air-to-air (BRAWLER) Configuration Control Boards (CCBs)
- Continued projects to advance and promote aircraft survivability within the Services
- Continued projects to gather and maintain survivability test data and actual combat damage data
- Continued the Ionomer Fuel Containment project
- Continued the Unmanned Air Vehicle (UAV) Active Acoustic Cancellation project
- Continued the Imaging Seeker Aim Point project
- Continued the Dry Bay Fire Model (DBFM) Ignition Phase Validation Data Assessment
- Continued the advanced survivable Rotorcraft Validation project
- Initiated and completed Armor Attachment Techniques Project
- Initiated and completed Simple Passive Extinguisher (SPEX) Project
- Initiated and completed Simulink Air Defense Artillery (ADA) Model Requirements Identification
- Initiated and completed Surface-to-Air Counter Tactics effort
- Initiated and completed the Fire & Explosion Calibration Project
- Initiated and completed Vulnerability – Predator Analysis
- Initiated Aircraft Battle Damage Repair (ABDR) Effectiveness & Durability project
- Initiated Directed Energy Assessment Model (DREAM) V & V activity
- Initiated High Power Wideband Array Project
- Initiated Laser-Focal Plane Array Effects Modeling for Laser Countermeasures Optimization
- Initiated Man Portable Air Defense Systems (MANPADS) Damage Effects Modeling
- Initiated Special Material Urban Decoy
- Initiated the Imaging Infrared (IIR) Sensor and Laser Effects Model Development
- Initiated the Integrated Survivability Analysis project

T&E Independent Activities

- Analysis and oversight of the Department's Test and Evaluation policy, resources and infrastructure, including the Major Range and Test Facility Base (MRTFB) and other key T&E centers, ranges, and capabilities:
  - Developed an OSD twenty-year plan for modernization of test infrastructure and integrated it with existing Component plans

- Analyzed T&E institutional and customer data in support of policy decisions regarding the composition and management of the MRTFBs
- Monitored and evaluated T&E infrastructure capacity and capability to ensure adequacy to meet requirements for both developmental testing and operational testing
- Developed and issued a summary and database of MRTFB capabilities in coordination with the Military Departments for use in assessing future test capability requirements
- Analyzed MRTFB operations and investment data and proposed issues for the Annual MRTFB Review
- Prepared a Summary Report of financial trends for MRTFB installations and evaluated the results for consistency with current policy and directives
- Analyzed T&E PPBE information for identification and resolution of potential shortfalls during Program and Budget Reviews
- Performed analyses to support budget issue resolution, Congressional responses, etc
- Spectrum Support:
  - Analyzed and reported on alternative options for telemetry operations in higher frequency bands
  - Developed technical alternatives on issues affecting T&E infrastructure
  - Provided technical support to Range Spectrum Requirements Working Group on spectrum issues
- Telemetry Support:
  - Continued to support DOT&E participation in International Consortium for Telemetry Secretary
  - Continued to develop technical approach for Integrated Network Enhanced Telemetry (INET)
  - Performed and conducted special studies on MRTFB radio spectrum issues
- Support to the Test Resource Management Center (TRMC)
  - Assisted in development of policies and organizational structures to implement the TRMC
  - Assisted in the initial operations of the Congressionally-directed Defense Test Resource Management Center
  - Participated in the development of the initial Strategic Plan
  - Developed analytic methodology for certification of the adequacy of T&E budgets
- Special Studies (Examples):
  - Developed a demographic profile of the T&E workforce as part of a Workforce Improvement Plan
  - Performed analyses of the cost and schedule implications of testing
  - Performed a study of the impact of early programmatic decisions on the ultimate execution of long-term test programs
  - Analyzed the effectiveness of selected inter-agency T&E facility agreements to determine whether the agreements provided DoD with necessary access to needed test capabilities

- Participated in the analyses of the National Aerospace Initiative (NAI) and in the NASA-DoD strategic planning activity for range instrumentation and space launch capabilities

- DTEPI:
  - Completed Live Fire Video Narrative for Defense Acquisition University Course TST-202's Update of Live Fire Block
  - Supported T&E Functional Integrated Product Team
  - Supported Army T&E Basic Course Front End
  - Updated Probability & Statistics Course to insure TST-202 Equivalence
  - Updated Security and reformatted the look of the DTEPI Website
  - Initiated the T&E Primer Course with the Stanford Research Institute
- Official Travel and Administrative Support:
  - Performed official travel in support of the DOT&E oversight of T&E infrastructure
  - Procured administrative support to carry out oversight of DOT&E programs
- Accounting and Financial Management Support:
  - Provided accounting and financial management support to the DOT&E

FY 2004 Plans:

T & E Programs:

JT&E:

- Complete the JGPSCE test, conduct out briefings, distribute the final reports, and transition test products
- Continue the JCMD test
- Continue the JBDA test
- Continue the JC2ISR test
- Continue the JUAV-TSO test
- Continue the JMACA test
- Continue the JLOG-PE test
- Continue the JDICE test
- Continue the JSCO (N), JIISO, and JUFE Joint Feasibility Studies
- Charter one to three DoD Representative Committee-prioritized FY 2004 Joint Feasibility Studies as Joint Tests and commences testing activities
- Conduct JT&E annual review of nominations for potential feasibility studies for conduct in FY 2005
- Determine through DoD Representative Committee prioritization the three or four FY 2004 Feasibility Studies

- Threat Systems:
  - Simulators
    - Continue to provide the tools to exchange the latest scientific and technological information between T&E and intelligence communities (e.g., Joint Service Surrogate, and IR SAM MATLAB/Simulink)
    - Continue oversight of Service threat simulators and threat digital models
    - Continue technical investigations to identify solutions for effectively representing asymmetric threats to include Chemical, Biological, Radiological, and Nuclear (CBRN); Information Warfare (IW); and terrorism-related threats to Homeland Defense in testing of U.S. weapons systems
    - Continue threat support to T&E through investigations of current scientific and technical intelligence information for insertion in Service threat representation modeling programs (e.g., IR SAM Design of Experiments, IR Air-to-Air Missile Engineering Analysis, Infrared Missile Plume Signature, Hybrid Simulator and Threat 3D Assessment Tool)
    - Continue the cooperative technical research and test bed projects to ensure threat representation (e.g., Seeker Aided Ground Guidance (SAGG) SAM ECM Operational Testing Capability, End-to-End Requirements Study (E2E), Multi-Camera Systems, Threat IR Imagery Commutative Multiplex and Test Events Model Analysis) adequacy for T&E
    - Update the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community
    - Provide threat assessment for DOT&E planning and evaluation
    - Provide oversight of Service activities in support of the DoD validation program for Service threat simulators and threat digital models
    - Execute the DoD validation program for threat simulators and threat digital models
  - Targets
    - Provide oversight of the Service activities in support of the DoD validation program for Service threat representative targets
    - Provide OSD seed funds to prototype solution to highest priority deficiencies in current target systems (e.g., Low Earth Orbit Satellite Target Control System Test Report, Underwater NBC Sensor Scoring System, ECM Miniaturization, Air Superiority Target Design Effort and UAV Threat Test Report)

- Support the implementation of new target modeling and simulation capabilities/tools that meet multi-Service T&E needs within common/DoD standard architectures (e.g., Subscale IR Countermeasures, Torpedo Threat Emulation Target, Subscale IR Signature Augmentation, Advanced Threat Receiver, Airborne Electronically Steered Antenna (AESA), IR Signature Validation Study, Subscale IR Hardbody Coating, BQM-167A CDA Implementation, Matrix Round Locator, and Advanced Offboard Countermeasures)
- Continue oversight of Service threat representative targets

- Center for Countermeasures:
  - CCM will test, analyze, report, assess and/or otherwise support over 30 US and foreign PGW systems/components, countermeasures, and threat-warning systems and other activities and programs, as listed below:
  - Air Force:
    - JPALS, AATC Comet, ASTE, Small Diameter Bomb, CV-22, BLADES, LITENING II Pod, and the KC-130J
  - Army:
    - Future Combat Systems, Tactical UAV, Comanche Defensive Suite, XM-982 Excalibur, Joint Common Missile, Longbow Hellfire, Longbow Apache, and Precision Guided Mortar Munition (PGMM)
  - Navy/Marines:
    - VTUAV, ATFLIR, SHIELDS/IEWS, TADIRCM, Kinematic Flare development, Advanced Amphibious Assault Vehicle, AN/AAR-47 Upgrade Missile/Laser Warning, MV-22, JSOW, SBLAS, and Starlight
  - Foreign:
    - Foreign Hand-Held Thermal Sight, and Foreign Laser Adjunct Program B series, FAPS-II, NAVE-G, FREE-G, FGPS, and GD-1 grenade
  - M&S:
    - MV and CV-22, Incorporated IR flare and IR threat missiles and M&S support of several countermeasures field tests
  - Other:
    - Continue TTCP (Trials KANTO and Blackbear), NATO Trial EMBOW
    - Continue providing technical and analytical expertise in support of DOT&E assessment tasks
      Provide CM inputs for evolving programs, identified by the Service Acquisition PEOs/PMs
      - Air Transport Measurements
      - CM Warfare Initiative:
        - Coordinate CM Warfare support at the Combatant Command and MAJCOM levels
        - Plan for participation in operational warfighting exercises and simulations (NTC, JRTC Rotations,), Desert Talon-1, and JTFEX 2004

- Continue to provide inputs to Joint Interoperability Tasks and operational exercises and simulations
- Continue development of software modifications to warfighting models and simulations to reflect EO/IR countermeasures scenarios at the Joint and Component Service level (JCATS, JSIMS, and CASTFOREM)

- Provide DARPA test, analysis, and assessment support

- JTCG/ME:
  - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., JSEM, AJEM, MEVA, MUVES, and ASAP)
  - Continue Combatant Commander data calls in support of FY 2005 program build requirements
  - Continue conversion/updates of existing JMEMs to CD-ROM format for JMEM Air-to-Surface Weaponeering System (JAWS) v2.4, Joint Anti-air Combat Effectiveness – Air Defense (J-ACE-AD) v2.0, Joint Anti-Air Combat Effectiveness - Air Superiority (J-ACE: AS) v3.0, JMEM/Surface-to-Surface Weaponeering Effectiveness System (JWES) v3.0, and continue configuration management for Target Vulnerability Data Management System (TVDMS) v2.3)
  - 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 expansion of existing databases to incorporate data for newly fielded weapons
  - 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, mean area of effectiveness (MAE) and dual stage warheads)
  - Continue to develop/sanitize JMEM products for foreign customers and coalition operations
  - Continue to expand pilot programs for compliance with near-term acquisition programs to support JMEM production at system IOC
  - Continue to reduce CD-ROM update cycles
  - Continue to work National Disclosure Policy issues relative to JMEM product release for foreign customers and coalition operations
  - Develop JMEM data for the most critical Combatant Commander identified systems Begin to ramp up to support the increased rate of data production that will be possible as a result of increased FY 2005 funding
  - Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) (Books-on-line, Automated products, Models, Tri-Service Data, and Support service)

- Investigate tri-service data, methodology and evaluate standards required to assess Information Operations/Computer Network Attack (IO/CNA)
- Plan development of tri-service vulnerability/lethality methodology for the HEL program
- Reduce major methodology shortcomings
- Release AJEM v2.2 (Integration of improved FATEPEN, Supporting ASP documentation on CD, Common AJEM/MUVES GUI)
- Convene the Model Review Committee to make a recommendation of AJEM accreditation

- JASP:
  - Complete Advanced Survivable Rotorcraft Validation Project
  - Complete UAV Active Acoustic Cancellation Project
  - Complete Imaging Seeker Aim Point Project
  - Complete the MANPADS Impact Point Assessment Project
  - Complete the Bonded Wing Survivability Demonstration
  - Complete ALARM Model Maintenance and Upgrades
  - Complete the Imaging Seeker Countermeasures Susceptibility Study
  - Complete the DBFM Ignition Phase Validation Data Assessment Project
  - Complete the Advanced Survivable Rotorcraft Validation Project
  - Complete the Special Material Urban Decoy Project
  - Complete the DREAM V&V into SURVIAC Project
  - Complete the Imaging Infrared (IIR) Sensor and Laser Effects Model
  - Continue projects to advance and promote aircraft survivability within the Services
  - Continue projects to gather and maintain survivability test data and actual combat damage data
  - Continue the DBFM/WINFIRE Enhancements Project
  - Continue the IIR Sensor and Laser Effects Model Development Project
  - Continue ALARM Model Upgrades
  - Continue participation on COVART/FASTGEN CCB
  - Continue SURVIAC Model Verification and Validation and Model Accreditation
  - Continue projects to advance and promote aircraft survivability within the Services
  - Continue projects to gather and maintain survivability test data and actual combat damage data
  - Continue SURVIAC Model Manager Support
  - Continue the COVART/FASTGEN CCB Project
  - Continue Support for Air to Air Simulations
  - Continue Laser-Focal Plane Array Effects Modeling for Laser Countermeasures Optimization

- Continue MANPADS Damage Effects Modeling
- Continue High Power Wideband Array Project
- Continue Integrated Survivability Analysis Project
- Continue the Rotary Wing (Battle Damage and Repair (BDAR) Project
- Conduct an Integrated Survivability Assessment demonstration for the Multi-Mission Aircraft
- Initiate Simulink Environment And Tools for Advanced IR Seeker Susceptibility Analysis
- Initiate and complete the Update and Pedigree Gun and Missile Books Project
- Initiate and complete the COVART modularization Project
- Initiate the Common Service Exciter Project
- Initiate the Countermeasure Susceptibility of New Foreign Threat IR Seekers Project
- Initiate the Reactive IR Suppressor Project
- Initiate the impact of electronic limiting on imaging seeker countermeasures project
- Initiate the Low Cost Helo IRCM components for advanced threats project
- Initiate the affordable visible missile warning system project
- Initiate the derivative Soviet MANPADS IRCM project
- Initiate the high resolution IRCM measurements project
- Initiate the MMW EW receiver for stand-in jammer project
- Initiate the miniaturized countermeasures for UAVs project
- Initiate the susceptibility reduction strategic planning project
- Initiate the RPG M&S Dytran/LS DYNA 3D hydrocode modeling using JLF RPG testing results project
- Initiate the joint resistance to RAM project
- Initiate the MANPADS Damage Effects on a large aircraft engine project
- Initiate the SECAD TS/HBR project
- Initiate the complex comp0osite rotorcraft structures survivability project
- Initiate the aircraft structure/flare buckets project
- Initiate the UAV survivability enhancement techniques project
- Initiate and complete the Intumescent “Instant Firewall” project
- Initiate and complete the assessment of tank wall pressures for ERAM validation project
- Initiate and complete the follow-on issues for weapons bays project

T&E Independent Activities

- Continue analysis and oversight of the Department’s Test and Evaluation policy, resources and infrastructure, including the Major Range and Test Facility Base (MRTFB) and other key T&E centers, ranges, and capabilities:

- Analyze the T&E infrastructure capabilities needed to support force transformation and provide data to support policy decisions regarding the composition and management of the MRTFB
- Analyze T&E financial operations and investment data and propose issues for the Annual Test and Evaluation Review Prepare a Summary Report and follow-up to ensure implementation of DOT&E solutions to issues
- Analyze test facility and range user cost practices and provide data and policy recommendations to support the Congressionally directed development of a single financial management and accounting system for T&E ranges
- Analyze T&E PPBE information for identification and resolution of potential shortfalls during FY2006-2011 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:
  - Develop technical approach for Real Time Telemetry Network (RTTN)
  - Perform and conduct special studies on MRTFB radio spectrum issues
  - Continue to support DOT&E participation in International Consortium for Telemetry Secretary
- Special Studies (Examples):
  - Review and revise MRTFB composition and funding policy directives
  - Refine Hypersonics and Directed Energy test capabilities modernization plans
  - Develop Roadmaps to implement testing in a Joint Force environment

- DTEPI:
  - Develop and update 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:
      - Range Safety Training Course
      - T&E Overview
- 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:
  - Provide accounting and financial management support to the DOT&E

FY 2005 Plans:

T & E Programs:

- JT&E
  - Complete JCMD, JBDA, JC2ISR, JUAV-TSO, and JMACA Tests. Conduct out briefings, distribute the final reports, and transition test products
  - Continue JLOG-PE, JDICE, and DoD Representative Committee-prioritized FY 2004 joint tests
  - Charter the one to three DoD Representative Committee-prioritized FY 2005 Joint Feasibility Studies as Joint Tests and commence testing activities
  - Conduct JT&E annual review of nominations for potential feasibility studies for conduct in FY 2006
  - Determine through DoD Representative Committee prioritization the three or four FY 2005 Feasibility Studies
- Threat Systems:
  - Simulators
    - Provide oversight of Service activities in support of the DoD validation program for Service threat simulators and threat digital models
    - Execute the DoD validation program for threat simulators and threat digital models
    - Provide threat assessment for DOT&E planning and evaluation
    - Update the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community
    - Implement common threat missile fly-out models used for test and evaluation
    - Conduct technical investigations and identify improvements to threat representations to ensure threat adequacy for multi-spectral sensor fusion T&E environments
    - Continue improvements to threat missile representations used in end-to-end testing of missile warning and countermeasures effectiveness
    - Continue oversight of Service threat simulators and threat digital models
    - Continue technical investigations to identify solutions for effectively representing asymmetric threats to include Chemical, Biological, Radiological, and Nuclear (CBRN); Information Warfare (IW); and terrorism-related threats to Homeland Defense in testing of U.S. weapons systems
    - Continue threat support to T&E through investigations of current scientific and technical intelligence information for insertion in Service threat representation modeling programs (e.g., IR Air-to-Air Missile Engineering Analysis, Hybrid Simulator and Threat 3D Assessment Tool)
    - Continue the cooperative technical research and test bed projects to ensure threat representation adequacy in T&E

- Continue to provide the tools to exchange the latest scientific and technological information between T&E and intelligence communities (e.g., IR SAM MATLAB/Simulink)

- Targets
  - Provide oversight of the Service activities in support of the DoD validation program for Service threat representative targets
  - Provide OSD seed funds to prototype solution to highest priority deficiencies in current target systems (e.g., Underwater Tracking System, Subscale Target Electronic Countermeasures (ECM) / Infrared (IR) Threat Realism, and Electronic Control Countermeasures (ECM) Miniaturization)
  - Support the implementation of new target modeling and simulation capabilities/tools that meet multi-Service T&E needs within common/DoD standard architectures (e.g., Subscale IR Countermeasures, and Advanced Off-Board Countermeasures)
  - Continue oversight of Service threat representative targets

- Center for Countermeasures:
  - CCM will test, analyze, report, and otherwise support over 30 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat-warning systems and other activities and programs, as listed below:
  - Air Force:
    - F-22 Raptor, JASSM, HH-60G SPS, AATC Comet, ASTE, A-10/F-16 FDE, Small Diameter Bomb, CV-22, LITENING-II Pod, and Powered-Low Cost Autonomous Acquisition System (P-LOCAAS)

    Army:
    - Comanche, Future Combat Systems, Tactical UAV, Wide Area Munition, Comanche Defensive Suite, Excalibur XM-982, Joint Common Missile, FCS, Longbow Hellfire, Longbow Apache, and AN/AVR-2B
  - Navy/Marines:
    - VTUAV, ATFLIR, SHIELDS/IEWS, ERGM, TADIRCM, Kinematic Flare development, Advanced Amphibious Assault Vehicle, Advanced Land Attack Missile, AN/AAR-47 Upgrade Missile/Laser Warning, Starlight, SBLAS, and MV-22
  - Foreign:
    - WHEAT SPEAR, Foreign Hand-Held Thermal Sight, FAPS-II, FLBR Live-Fire, FGPS Munition B series, Foreign False Target Generator, Foreign Laser Guided Projectile, and FGPS
  - M&S:
    - MV and CV-22
      - Incorporate IR flare and IR threat missiles

- Other:
  - TTCP
    - Air Transport Measurements continuing measurement and assessment
    - Provide CM inputs for evolving programs, identified by the Service Acquisition PEOs/PMs
    - CM Warfare Initiative:
      - Coordinate CM Warfare support at the Combatant Command and MAJCOM levels
      - Plan for participation in operational warfighting exercises and simulations
      - Continue to provide inputs for EO/IR CM training and equipment and Joint Interoperability
      - Continue to develop software modifications to Joint and Component Service level simulations (JCATS, JSIMS, and CASTFOREM)
  - Continue to provide technical and analytical expertise to DOT&E assessment tasks
- JTCG/ME:
  - Release AJEM v2.x
  - Develop JMEM data for most critical Combatant Commander identified systems. Continue updates of existing JMEMs CD-ROMs (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v3.x, Joint Anti-air Combat Effectiveness – Air Defense (J-ACE-AD) v3.x, Joint Anti-Air Combat Effectiveness - Air Superiority (J-ACE: AS) v4.0, JMEM/Surface-to-Surface Weaponeering Effectiveness System (JWES) v4.0, and Target Vulnerability Data Management System (TVDMS) v3.0). Continue to reduce CD-ROM update cycles through incremental updates. Continue transition to a Target Oriented JMEM
  - Develop tri-service vulnerability/lethality methodology for the IO/CNA program
  - Develop tri-service vulnerability/lethality methodology for the Directed Energy Weapons (DEW) program
  - Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) (Books-on-line, Automated products, Models, Tri-Service Data, and Support service)
  - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models
  - Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Anti-Air effectiveness calculations
  - Continue expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface, Surface-to-Surface Direct/Indirect Fire and Anti-Air)
  - Continue execution and technical coordination efforts to address Target Vulnerability data generation and methodology improvements)
  - Continue Combatant Commander data calls in support of FY 2006 program build requirements
  - Continue to engage near-term acquisition programs to support JMEM production at system IOC (i.e., bring critical developmental systems into the JMEM process)

- Continue to work National Disclosure Policy issues relative to JMEM product release for foreign customers and coalition operations

With the additional DoD funding plus up the following projects will be initiated to address critical COCOM and Service requirements:

- Develop the target geometry model (TGM), generate vulnerability data, and produce JMEM data for approximately 50 high-priority Combatant Command targets (e.g., surface mobile/fixed, air, hard/deeply buried and ship targets) producing approximately 3000 weapon-target pairings
- Enhance collateral damage and hardened target methodologies (Fast Assessment Strike Tool-Collateral Damage (FAST-CD) and Integrated Munitions Effectiveness Assessment (IMEA))
- Accelerate the move to a capabilities based JMEM, accounting for newly fielded systems employing other than traditional kinetic damage mechanisms
- Advance efforts to provide connectivity to real time planning systems assessing time sensitive targets

- JASP:
  - Complete Laser-Focal Plane Array (FPA) Effects Modeling for Laser Countermeasures Optimization
  - Complete High Power Wideband Array Project
  - Complete Integrated Survivability Analysis Project
  - Continue projects to advance and promote aircraft survivability within the Services
  - Continue projects to gather and maintain survivability test data and actual combat damage data
  - Continue SURVIAC Model Verification and Validation and Model Accreditation
  - Continue SURVIAC Model Manager Support
  - Continue ALARM Model Maintenance
  - Continue the Common Service Exciter Project
  - Continue the Countermeasure Susceptibility of New Foreign Threat IR Seekers Project
  - Continue the Reactive IR Suppressor Project
  - Continue the impact of electronic limiting on imaging seeker countermeasures project
  - Continue the Low Cost Helo IRCM components for advanced threats project
  - Continue the affordable visible missile warning system project
  - Continue and complete the derivative Soviet MANPADS IRCM project
  - Continue the high resolution IRCM measurements project
  - Continue the MMW EW receiver for stand-in jammer project
  - Continue and complete the miniaturized countermeasures for UAVs project
  - Continue the susceptibility reduction strategic planning project
  - Continue the RPG M&S Dytran/LS DYNA 3D hydrocode modeling using JLF RPG testing results project

- Continue and complete the joint resistance to RAM project
- Continue the MANPADS Damage Effects on a large aircraft engine project
- Continue the SECAD TS/HBR project
- Continue and complete the complex composite rotorcraft structures survivability project
- Continue and complete the aircraft structure/flare buckets project
- Continue the UAV survivability enhancement techniques project
- Continue Simulink Env. And Tools for Advanced IR Seeker Susceptibility Analysis
- Continue Air to Air CCB for ASPEM and BRAWLER
- Continue MANPADS Damage Effects Modeling
- Initiate projects to counter advanced threats
- Initiate projects to develop survivability enhancements in fire & explosion protection
- Initiate projects to develop survivability enhancements in flight systems
- Initiate projects to develop survivability enhancements in platform & crew protection
- Initiate projects to develop survivability enhancements in propulsion systems
- Initiate projects to develop survivability enhancements in structural design
- Initiate projects to improve survivability analysis and design tools for Model management
- Initiate projects to improve survivability analysis and design tools for M&S credibility
- Initiate projects to reduce the MANPADS threat to aircraft

T&E Independent Activities

- Continue analysis and oversight of the Department's Test and Evaluation policy, resources and infrastructure, including the Major Range and Test Facility Base (MRTFB) and other key T&E centers, ranges, and capabilities:
  - Monitor and evaluate the T&E infrastructure and resources to ensure adequacy to provide capabilities associated with Test transformation to provide testing in a joint force environment
  - Develop and issue a summary and database of test and evaluation capabilities in coordination with the Military Departments for use in assessing future capability requirements
  - Analyze T&E institutional and customer data in support of policy decisions regarding the composition and management of the MRTFBs
  - Analyze T&E financial and manpower data and propose issues for the Annual T&E Review. Prepare a Summary Report and follow-up to ensure implementation of DOT&E solutions to issues
  - Analyze T&E PPBE information for identification and resolution of potential shortfalls during FY2007-11 combined (off-year) program/budget review
  - 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):
  - Develop process for and initiate T&E infrastructure modernization planning with industry
  - Conduct T&E shortfalls survey to support revision of the 15 to 20 year modernization plan
  - Develop integrated test and training range plan and develop methodologies to better integrate testing in the training process
- DTEPI:
  - Develop and update 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:
    - A Guide to Targets and their Capabilities
- 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:
  - Provide accounting and financial management support to the DOT&E

(U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2003	FY 2004	FY 2005
FY 2004 President's Budget	64.140	103.245 [1]	104.679 [1]
Current Budget Submit	63.426	104.381	112.679
Total Adjustments	(0.714)	1.136	8.000
Congressional Program Reductions		(1.364)	
Congressional Rescissions			
Congressional Increases		2.500	
GYPSY DELTA Program Transfer [2]		2.500	
Reprogramming	(0.714) [3]		
Program Adjustment			8.000

Notes:

1. **Reflects the transfer of the JT&E program from USD(AT&L) Appropriation 0400 to DOT&E and Appropriation 0460**
2. **Reflects the Congressionally mandated transfer of the GYPSY DELTA program from USD(AT&L) Appropriation 0400 to DOT&E and Appropriation 0460**
3. **Reprogramming from PE 0605804D to PE 0605118D**

C. (U) OTHER PROGRAM FUNDING SUMMARY: NA

OFFICE OF THE SECRETARY OF DEFENSE

OEPRATIONAL TEST AND EVALUATION, DEFENSE (0460)

SUMMARY OF FY 2005 BUDGET ESTIMATES
(In Thousands of Dollars)

Appropriation Account Title	Direct Budget Plan (TOA)			Budget Authority			Outlays		
CIS Account Title	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate
RDT&E (DoD): 0460	239.579	302.080	305.135	239.579	302.080	305.135	243.083	299.091	304.922

Operational Test and Evaluation, Defense

OFFICE OF THE SECRETARY OF DEFENSE

OPERATIONAL TEST AND EVALUATION, DEFENSE (0460)

ADVISORY AND ASSISTANCE SERVICES

(Dollars In Thousands)

OPERATIONAL TEST AND EVALUATION, DEFENSE APPROPRIATION (0460)	FY 2003 Actuals	FY 2004 Estimate	FY 2005 Estimate
I. Management & Professional Support Services			
FFRDC Work	0	0	
Non-FFRDC Work	2,354	2,799	2,550
Subtotal	2,354	2,799	2,550
II. Studies, Analysis & Evaluations			
FFRDC Work	5,554	7,133	7,839
Non-FFRDC Work	0	0	
Subtotal	5,554	7,133	7,839
III. Engineering & Technical Services			
FFRDC Work	23,331	23,331	24,078
Non-FFRDC Work	9,510	8,130	8,664
Subtotal	32,841	31,461	
TOTAL	40,749	41,393	43,111
FFRDC Work	28,885	30,464	31,917
Non-FFRDC Work	11,864	10,930	11,194

Exhibit PB-15, Advisory and Assistance Services
(Exhibit PB-15, Page 1 of 1)

OFFICE OF THE SECRETARY OF DEFENSE

OPERATIONAL TEST AND EVALUATION, DEFENSE (0460)

COMPETITIVE AND STRATEGIC SOURCING

Negative Report

OFFICE OF THE SECRETARY OF DEFENSE

OPERATIONAL TEST AND EVALUATION, DEFENSE (0460)

Document Declassification
FY 2005 President's Budget
(Dollars in Thousands)

Appropriation	FY2003 Actual	FY 2004 Estimate	FY 2005 Estimate
0460	0	0	0
Total	0	0	0

Declassification