RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)				February 2002					
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 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	COST TO COMPLETE	TOTAL COST
PE 0603941D		7.944	6.010	5.974	5.912	5.900	5.842	Continuing	Continuing

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

This is a new start program in FY 2002. For the first time, there is a structured program that fosters a robust Test and Evaluation and Science and Technology (T&E/S&T) planning process. This program will allow test technologies to pace evolving weapons technology, and is absolutely critical to ensuring that we have the capability to fully and completely test the advanced systems that will be fielded in the future. The operational demands under which the DoD conducts Test and Evaluation (T&E) of increasingly sophisticated weapon systems have grown exponentially. Weapon technology is quickly outdistancing our ability to adequately test systems as they develop. 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/exploits commercial equipment and networking innovations to support the T&E community.

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

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

(U) PROGRAM PLANS:

FY 2002 Plans:

Spectrum Efficient Technology: Specific goals in the spectrum area include increasing bandwidth efficiency by a factor of three over the next five years, increase use of available frequencies by 100% over the next ten years, and increase information capacity of range telemetry data systems by a factor of seven over the next 15 years. T&E/S&T program will initiate projects that develop advanced technologies that address these goals. Specifically, in FY 2002 projects will be initiated that increase spectral efficiencies by orders of magnitude and investigate alternative frequencies and the technical obstacles that must be overcome, including transmitter power, antennas, Doppler effects, channel characteristics, and atmospheric attenuation. Technology investigations in this area directly supports the increasing data rates that advanced weapon systems require.

Multi-Spectral Sensors Test and Evaluation: Investigate and evaluate test technologies required to test complex multi-spectral sensor arrays and to provide multi-spectral test environments (that simulate battlefield environments) that stimulate the advanced weapon systems currently under development. Specific challenges to the test community are data fusion requirements, visualization techniques, and information assurance. Advances are sought in remote sensing systems; detector algorithms; human-machine interface development (e.g. heads-up displays); computational tools (e.g. signature models); sensor system target detection, acquisition, and identification and targeting assessments; countermeasure survivability and countermeasure enhancements; multi-spectral sensor fusion, networking, and sensor integration component testing; innovative approaches to test facilities and test instrumentation platforms (all weather sensor suites); land combat sensor analysis; target-background/foreground interactions; both human and materiel performance metrics development and testing; integrated multi-spectral sensor information development; fire-and-forget, and hit-to-kill sensor T&E concepts.

Hypersonic Testing Technologies: Investigate technologies needed for test and evaluation of hypersonic (MACH 10+) ground test capabilities. Areas of research that require advances in test and evaluation technologies are those associated with: ramjets, scramjets, hypersonic combustors, hypersonic weapon lethality and survivability assessment, high temperature engine components, infrared and radio-frequency materials for hypersonic weapons systems, stability and control, guidance and control, innovative flight test technologies for hypersonic vehicles, integrated propulsion and airframe testing, computational T&E tools, hypersonic flow diagnostics, plasma dynamics and electromagnetic-flow field interactions or other drag reduction technologies, and hypersonics aerothermodynamics.

Embedded Instrumentation: Investigate and develop requirements for, and benefits of, embedded, non-intrusive test instrumentation employing microelectronic, microelectromechanical (MEMS), and nano-size technologies. Initial investigations will focus on micro-miniaturization of instrumentation components such as inertial measurement units, multi axis stress/strain gauges, field-programmable gate

arrays with embedded analog/digital converters, wireless sensors, and power supplies. Embedded test instrumentation will be crucial to testing systems such as low observable, multi spectral stealth, and hypersonic weapons.

T&E/S&T Master Plan: This plan will document the near and long term test capability shortfalls in a test technology roadmap. This plan will be consistent with the Department's other planning documents such as Joint Vision 2020, the Defense Science and Technology plans, and the Defense Planning Guidance to insure that the projects funded by this office meet future needs.

Official Travel : Perform official travel to carry out oversight of T&E/S&T program.

FY 2003 Plans:

Funding levels preclude new starts in FY 2003, however a limited subset of the most critical and promising technology developments for FY 2002 will be continued to complete their transition to the T&E community.

B. (U) PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2001 Appropriation	FY 2002 Amended President's Budget Request	FY 2003 Clinton Budget
FY 2002 President's Budget		16.000	6.000
Congressional Reduction		(8.000)	
Appropriated Value		8.000	
Adjustments to Program Value			
Congressional Reduction (Sec 8123, PL 107-117)		(0.056)	
Inflation Adjustment			(0.080)
Program Adjustment			0.090
Current Budget Submit		7.944	6.010

C. (U) OTHER PROGRAM FUNDING NA