RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)			July 2001		
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY THREE			TEST AND EVALUATION SCIENCE AND TECHNOLOGY PE 0603941D8Z		
$'s in Millions	FY 2000	FY 2001	FY 2002	COST TO COMPLETE	TOTAL COST
PE 0603941D			16.000	Continuing	Continuing

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

This program, for the first time, provides the DoD with a structured program that fosters a robust Test and Evaluation/Science and Technology (T&E/S&T) integrated 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 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 weapons 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 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 Program Element also includes funds to perform official travel in support of its activities.

This program is Budget Activity 3, Advanced Technology Development, since it develops and demonstrates high payoff technologies for current and future DoD test capabilities.

(U) PROGRAM PLANS:

FY 2002 Plans:

Embedded Instrumentation: Establish a series of advanced technology demonstration projects to evaluate the use of embedded sensors and processors employing microelectronic, microelectromechanical (MEMS), and nano-size technologies to reduce the developmental test and operational test equipment impacts on systems in test, training or operational deployment. Initial projects 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. Products from this effort will be crucial to testing systems that demand non-intrusive test instrumentation such as low observable, multi spectral stealth, and hypersonic weapons.

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 FY02 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.

Information Systems Technology: Investigate and evaluate test technologies required to test complex multi-spectral sensor arrays and to provide multi-spectral test environments (that simulate battlefield environments), to stimulate the network centric warfare systems currently under development. Specific challenges to the test community are data fusion requirements, visualization techniques, and information assurance. Initiate projects to investigate modeling and simulation technologies required to aid in the evaluation and analysis of advanced weapons system. Areas of investigation in support of live fire test and evaluation area may include technologies to evaluate the survivability of fielded weapons systems and planned weapon system concepts to single or multiple hits from threat weapon systems, or projects to accurately predict the full 3-D time dependent structural damage processes, including high strain rate effects, that occur when a complex structure is impacted by a threat weapon. Investigate the development and integration of advanced information management/information transfer (IM/IT) techniques for use in the test network infrastructure.

Hypersonic Testing Technologies: Investigate technologies needed for test and evaluation of hypersonic (MACH 10+) ground test capabilities. Areas of research include energy sources required to be “dumped” into high-speed air streams to create the correct similitude for sustained environmental simulations on the ground.

Space-Based Test Range: Investigate the technical architecture requirements and associated technology requirements for a comprehensive space-based test range, to include hit-to-kill end game scoring requirements, capacitive blankets, and small baseline interferometers.

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.

(U) B. PROGRAM CHANGE SUMMARY

($ in Millions)	FY 2000	FY 2001	FY 2002
FY 2001 President's Budget	0	0	0
Appropriated Value	0	0	0
Adjustments to Appropriated Value			
Current Budget Submit			16.000[1]

[1] $3.000 of the funds for this PE were transferred from PE 0605940D Central Test and Evaluation Investment Program (CTEIP)