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Note: This Administration has not addressed FY 2003 - 2007 requirements. All FY 2003 - 2007 budget estimates included in this book are notional only and subject to change.

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1							R-1 ITEM NOMENCLATURE In-House Laboratory Independent Research (ILIR) **PE 0601101D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	2.019	1.989	2.097						Continuing	Continuing
ILIR/P503	2.019	1.989	2.097						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)This program element supports basic medical research at the Uniformed Services University of the Health Sciences (USUHS) and provides the only programmed research funds received by the University. In addition, this program facilitates the recruitment and retention of faculty; supports unique research training for military medical students and resident fellows; and allows the University`s faculty researchers to collect pilot data in order to secure research funds from extramural sources (estimated $25-$30 million annually). Eighty to 100 intramural research projects are active each year, including 20-25 new starts. Projects are funded on a peer-reviewed, competitive basis. Results from these studies contribute to the fund of knowledge intended to enable technical approaches and investment strategies within Defense Science and Technology (S&T) programs.

(U)The ILIR program at USUHS is designed to answer fundamental questions of importance to the military medical mission of the Department of Defense in the areas of Combat Casualty Care (CCC), Infectious Diseases (ID), and Military Operational Medicine (MOM). The portfolio of research projects will vary annually because this research is investigator-initiated. Examples of typical research efforts are:

Combat Casualty Care: Ischemia and reperfusion injury, traumatic brain and peripheral nerve injury, neural control of pain, endotoxic shock, malignant hyperthermia, inflammation and wound healing.

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Infectious Diseases: Immunology and molecular biology of bacterial, viral and parasitic disease threats to military operations. These threats include E. coli and their shiga toxins, HIV, HTLV-1, strongyloides, gonorrhea, streptococcus, hepatitis A, typhoid, influenza A, Venezuelan equine encephalitis (VEE), malaria, and bartonellosis.

Military Operational Medicine: Sustainment of individual performance, deployment and operational stressors, cognitive enhancement, military & medical training readiness.

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COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	2.019	1.989	2.097						Continuing	Continuing
ILIR/P503	2.019	1.989	2.097						Continuing	Continuing

(U) Project Number and Title: P503 ILIR

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Combat Casualty Care: This program provides support for 16 projects that investigate various aspects of wounding and wound healing. Emphasis currently falls on the roles that inflammatory mediators play in these processes. Investigation of endotoxin sensitivity at the cellular level has characterized the cascade of activation and influx of inflammatory cells in gram-negative sepsis in response to LPS, an important step in identifying targets for controlling sepsis-based inflammation. Work toward mapping the activation mechanism of opioid receptors led to identification of specific G proteins responsible for diminishing the ability of opioids to relive pain. Investigation of transcriptional control of differentiation in neural cells established that Myt-1 proteins may facilitate repair in the central nervous system. ($ 0.370 million)

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(U) Infectious Diseases: As in previous years, infectious disease research was one of the most active fields at USUHS, with 27 projects underway during FY00. Militarily relevant biological threat agents such as E. coli and its toxins, influenza A, typhoid and HIV all garnered significant resources. A study comparing neutralizing antibody responses to HIV and VEE completed its first phase, where in vivo safety tests elicited no adverse reactions to intracerebral administration of the replicon vaccine. Results from an ongoing investigation of lactobacillus as a possible pro- biotic agent against gonorrhea suggested that, during infection, N. Gonorrhea generates high amounts of an enzyme that can combat the H2O2 produced by lactobacilli. Work on a family of protocols investigating the transmission of Bartonellosis in Peru expanded to include a newly discovered epidemic population, a useful model for the experience of a military population entering an infectious region. A protocol to develop a candidate vaccine for HIV-1, new in FY00, generated HIV-1 envelope glycoproteins for in vivo testing in a mouse model during FY01.
($ 0.653 million)

(U) Military Operational Medicine: The forty-one projects in the MOM program included on-going work on identifying the causes of stress fractures, particularly among active women, and the response of endocrine function to (1) emotional stress and (2) strenuous physical exertion. A study of the role of melanopsin in regulating circadian rhythm showed that polarized and non-polarized light are equally effective in controlling acute pineal melatonin suppression. Investigation of the role of neuromodulators in the amygdala in rats with elevated basal level of endogen-ous norepinephrine suggested that beta-blockers can help diminish formation of traumatic emotional memories. A cultured-cell study of glutaminergic processes found preliminary indications that NMDA protects against neuronal cell death. Investigation of pituitary responses to dexamethasone and disulfiram in vivo found that the regulation of PHM`s expression and catalytic efficiency serve as coordinated physiological mechanisms for maintaining appropriate levels of alpha-amidating activity, although the response to the two drugs occurs via different mechanisms.
($ 0.996 million)

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(U) FY 2001 Plans:

(U) Infectious Diseases: Work continues toward development of vaccines for HIV, gonorrhea, and other STDs; understanding of the pathogenesis of VEE, HTLV-1, and influenza A; and effective management of infections by H. pylori and Bartonellosis. New studies include the next stage of an investigation of shiga-like toxins of E. coli; neutralizing antibody response to VEE and HIV replicons; and identification of a new possible transmission vector for Bartonellosis. ($ 0.725 million)

(U) Military Operational Medicine: New projects supported in FY00 include analysis of the circadian photoentrainment pathway in a murine model; regulation of peptide amidation; and immediate early gene requirements for long-term potentiation and learning. Studies of stress in relation to eating disorders, nicotine use, physical exertion, and immunosuppression will all continue, as will investigation of transcriptional control of neural cell differentiation, the role of AP-1 proteins in synergistic signaling, and the role of neuromodulators in neuroplasticity in the amygdala. ($ 0.841 million)

(U) Combat Casualty Care: Ongoing projects include a family of studies of malignant hyperthermia, aimed primarily at developing a reliable genetic marker; investigation of signal transduction; and endotoxins. New projects in FY01 will pursue a noninvasive diagnostic test for malignant hyperthermia and investigate the mechanism of liver failure in a disulfiram-based model.
($ 0.423 million)

(U) FY 2002 Plans:

(U) Efforts will continue in all of USUHS`s major research areas (CCC, ID, and MOM) in FY01. Since specific, investigator-initiated projects compete for funding each year, no detailed description of the research is possible at this time. ($ 2.097 million)

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(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	2.029	2.007	2.086	Continuing
Appropriated Value		2.007		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.018	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.010	0.000	0.011	
c. Other	0.000	0.000	0.000	
Current President's Budget	2.019	1.989	2.097	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding changes are due to reprogramming adjustments. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical:

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(U) C. OTHER PROGRAM FUNDING SUMMARY COST: N/A

(U) D. ACQUISITION STRATEGY: N/A

(U) E. SCHEDULE PROFILE: N/A

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	223.366	292.286	240.374						Continuing	Continuing
URI/P103	201.853	292.286	240.374						Continuing	Continuing
DEPSCoR/P104	21.513	0.000	0.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT:

(U) P103, University Research Initiative (URI). The URI has three primary objectives: (1) to support basic research in a wide range of scientific and engineering disciplines pertinent to maintaining the U.S. military technology superiority; (2) to contribute to the education of scientists and engineers in disciplines critical to defense needs; and (3) to help build and maintain the infrastructure needed to improve the quality of defense research performed at universities. Paralleling these objectives, this project competitively supports programs at universities nationwide in three interrelated categories:

- Research. The main thrust of the URI is multidisciplinary research. Multidisciplinary efforts involve teams of researchers investigating high-priority topics that intersect more than one traditional technical discipline; for many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. Two multidisciplinary thrusts beginning in FY2001 are university research for the National Nanotechnology Initiative and for critical military infrastructure protection. The URI also supports the Presidential Early Career Awards for Scientists and Engineers (PECASE), single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers.

- Education. The URI promotes graduate education in science and engineering for U.S. citizens through the National Defense Science and Engineering Graduate Fellowship Program.

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- Infrastructure. Through the Defense University Research Instrumentation Program (DURIP), the URI contributes to the university research infrastructure that is essential for the performance of cutting-edge defense research. The DURIP allows researchers to purchase more costly items of research equipment than typically can be acquired under single-investigator awards. Through FY 2001, the URI also includes the URI Support Program (URISP), which broadens the base of academic institutions participating in defense research by involving institutions that historically have not received much defense funding. These programs complement the infrastructure building of the Defense Experimental Program to Stimulate Competitive Research that was in project P104 of this program element through FY 2000.

(U) P 104, Defense Experimental Program to Stimulate Competitive Research (DEPSCoR). The DEPSCoR helps build research infrastructure at academic institutions in states that historically have not received much Federal research funding. In FY 2001, the DEPSCoR moved from project 104 within this URI program element into a new program element (PE 0601114D8Z).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY2000 Accomplishments:

(U) Programmatic accomplishments:

- Research. The FY 2000 multidisciplinary research competition conducted by the Services resulted in 20 new awards in high-priority basic research areas of multi-Service interest related to: data fusion in microsensor arrays; adaptive learning technology; decision making in the presence of uncertain information; battlespace visualization; real-time, fault-tolerant network protocols; solitonic information processing; quantum communications and memory; mobile wireless networks; electronics and optoelectronics; ultracold atom optics; functional materials; and prime reliant coatings. New knowledge and understanding resulting from basic research related to these technology areas will lead to applications relevant to a broad range of future military systems. The multidisciplinary nature of these areas, and their multi-Service relevance, make them ideally suited for inclusion under the multidisciplinary element of the URI. In addition to the new multidisciplinary research efforts, multidisciplinary and PECASE programs begun in prior years continued, with new competitive awards for PECASE programs. ($139.574 million)

- Education. Under the National Defense Science and Engineering Graduate Fellowship program, 108 new graduate fellowships were competitively awarded for study leading to advanced degrees in science and engineering fields of importance to national defense. ($13.848 million)

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- Infrastructure. More than 220 new awards were made under the FY 2000 DURIP competition, enabling the purchase of research instrumentation needed to sustain universities' capabilities to perform cutting-edge defense research. Under the URI Support Program, efforts initiated in prior years continued in areas such as electronic and magnetic materials, image analysis, micromanufacturing, and neurodynamics. The FY 2000 competition under the DEPSCoR program resulted in 81 new awards. ($69.944 million)

(U) Selected technical accomplishments:

- Researchers at the State University of New York at Stony Brook, in partnership with Rennselaer Polytechnic Institute, Boston University, Iowa State University, Arizona State University, and Manhattan College, developed a comprehensive computer model to simulate and improve understanding of crystal growth processes. The model is unique in that it covers globally the entire system involved in crystal growth (e.g., the heat transfer from the various heaters, the dynamics of the liquid phase from which the crystal grows, the growing solid phase and its interface with the liquid phase). The increased understanding permits growth of crystals with fewer defects, leading to increased yields and usable crystals of larger diameters. One advance concerns indium phosphide (InP) crystals needed for high frequency satellite-to-ground and satellite-to-satellite links. For InP, the team used simulations, crystal growth experiments (in collaboration with the Air Force Research Laboratory, Sensors Directorate) and characterizations of resulting materials to understand how the density of crystal defects—twins and dislocations—are linked to material stress and thereby to growth conditions (e.g., temperature, temperature gradient, pressure, and rotation rate of the sample during growth). Using this knowledge, they controlled growth conditions to reduce twins and dislocations, producing usable crystals with twice the diameter (4", rather than 2") and 25% greater yields. Another advance is for silicon carbide (SiC) crystals used in solid-state devices for high-power microwave applications, particularly where higher operating temperatures are needed. By simulating the vapor growth of SiC and using the new understanding to improve control of the process, the researchers reduced the size of "micropipes," microscopic holes that make the crystal surface unusable for electronic devices, and reduced their density from over 1000 to as little as 2-3 per square centimeter. With this reduction in micropipe density, 75% more chips can be placed on a wafer of a given size. In a third area, the researchers developed the first model of the hydrothermal synthesis process that is used to grow high-quality quartz crystals for timing in the Global Positioning System and other space-based applications. Resulting improvements in that process can enable 30-40% higher growth rates for advanced nonlinear optical materials, such as bismuth silicate and zinc oxide that are used to process and store information.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

- Scientists and engineers at the University of California at Los Angeles and University of Southern California (USC) synthesized a new electro-optic polymer with an exceptionally high electro-optic (E-O) coefficient. The new material enabled USC researchers to demonstrate an E-O modulator for optical communications that has lower optical loss than lithium niobate and operates at high frequencies with significantly lower applied voltages. The high E-O coefficient in the polymer stems from inclusion of highly polarizable molecules called chromophores. Based on their theoretical analysis, the scientists modified the chromophores' shape in a way that allowed the molecules to better align with each other, thereby yielding E-O coefficients comparable to those observed in an inorganic modulator material like lithium niobate. With the polymer, however, the light wave that is being modulated moves at a speed that more closely matches the speed of the applied, radio-frequency (RF) voltage that does the modulating, allowing the modulation to occur over a longer interaction region within the polymeric material than it would in the inorganic material. Consequently, the polymer needs less RF driving voltage at any given modulation frequency and can operate at higher frequencies before the gain of the link falls off or the noise level becomes too large. The researchers have demonstrated a modulator at about 100 gigaherz with good thermal stability to temperatures near 100 degrees Farenheit, drive voltage near one volt, and low insertion loss (less than 8 decibels from the input to output optical fiber). This advance is important to high-bandwidth data transmission for the digitized battlefield, network-centric warfare (e.g., using a secure, internet-based, common tactical picture), and many other military applications.

- A team of aerospace engineers and materials scientists at the Massachusetts Institute of Technology made a number of strides toward developing piezoelectric actuators capable of larger mechanical displacements, or strokes. Longer-stroke actuators are important for military applications such as twisting helicopter rotor blades or rotating their trailing edge flaps, to reduce harmful blade vibrations and blade-vortex interaction noise. The team grew for the first time single-crystal fibers of high-strain piezoelectric oxides (e.g., sodium bismuth titanate, or NBT), using an edge-defined film-fed growth method. The NBT's maximum strain is larger than the maximum strain for what is now the leading piezoelectric ceramic material, lead zirconate titanate (PZT). With the added advantage of the single crystal fibers, as opposed to polycrystalline PZT fibers, the researchers demonstrated actuators with eight times the stroke of conventional PZT actuators. Switching to crystalline oxides from PZT, which contains lead, also will reduce toxicity. Another accomplishment was the development of a micro-molding technique to form interconnected mats of polycrystalline fibers. This technique offers two advantages over current methods. It produces higher quality fibers, with fewer voids or other defects, to increase the length of the stroke obtainable with polycrystalline materials. More importantly, it produces interconnected mats of fibers—current methods generate single fibers of 130 micron diameter and building an actuator is a labor-intensive process that requires alignment of hundreds of fibers, one by one, into a sheet. This is an important step toward increasing production and reducing the cost of an actuator from about $1,000 currently, with the goal being to reduce it to $20-25. In parallel with these efforts, the team developed a mathematical model to gain an understanding of the transient behavior, under slow loading conditions, of active fiber composites and other highly insulating devices; this understanding is needed to help optimize piezoelectric actuators for defense applications.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

- Researchers at the University of Texas at Austin developed a new approach for detecting low concentrations of chemical and biological warfare agents. The approach identifies specific agents and does so quickly, allowing personnel to protect themselves or take medical countermeasures. The new system is a major advance over current methods for detecting low concentrations of biological agents because it is compatible with a portable device that troops could use in the field; current methods require bulkier laboratory equipment not always readily accessible to troops in combat situations. In their new approach, the researchers developed multiple types of sensors and achieved rapid production of them in quantity (hundreds of uniquely responsive detectors can be fabricated within a week). The sensors include: solutions that change color in the presence of specific disease-causing organisms; highly specific proteins that produce a measurable signal in response to toxins in the environment; nucleic acids that read the DNA of organisms and are able to detect unique genetic markers for anthrax bacilli and other biological agents; and antibody sensors that detect specific components of the spore coats of bacterial agents. The extremely sensitive sensors can detect concentrations of agents in the range of parts per million to parts per billion. The researchers attach the sensors to beads that they put into discretely separated wells that can be micromachined in large numbers in a silicon substrate. Because the sensors are in wells, rather than on a chip surface, the approach can use solution-phase reactions to detect agents. Troops would use the combined responses of different types of sensors in a single, portable microarray to recognize a wide range of known agents and to detect previously unknown threats.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

(U) FY 2001 Plans:

- Research. The Services are making 84 new awards as a result of three FY 2001 competitions for new multidisciplinary research efforts. The first competition, resulting in 48 new awards, was for basic research underpinning high-priority technology areas such as: infrared detection; wideband communication systems; networked and distributed systems; microchemical systems; biological and chemical sensing concepts; smart and adaptive structures; visualization of multi-source information; space weather effects; self-configuring surveillance networks; machine language translation; low-noise, solid state electronics; high-temperature superconductors; nano-engineered coatings; and polymeric, smart skin materials. The second competition was under the Department of Defense portion of the National Nanotechnology Initiative. As a result of that competition, the Services are making 16 new awards focused on defense-relevant electronics, materials and biotechnology at the nanoscale, in areas such as machines and motors; energetic materials; electronic and magnetic structures; quantum computing; carbon nanotubes; and deformation, fatigue, and fracture of interfacial materials. The third competition was for an initiative in the area of critical infrastructure protection. Following that competition, the Services are making 20 new awards focused on information assurance and high-confidence adaptable software, including novel network architectures, network surveillance and software protection, high-confidence embedded systems, mobile codes, distributed computing, dynamic network management, and software quality assurance. Multidisciplinary and PECASE programs begun in prior years are continuing, with new competitive awards under the PECASE program. ($193.803
- million)

- Education. As a result of the FY 2001 competition under the National Defense Science and Engineering Graduate Fellowship program, 285 new graduate fellowships were awarded for study leading to advanced degrees in science and engineering fields of importance to national defense. Another competition, part of the FY 2001 initiative in critical infrastructure protection, led to 12 postdoctoral fellowship awards. ($43.667 million)

- Infrastructure. FY 2001 competitions resulted in more than 240 new awards for research instrumentation under the DURIP program and National Nanotechnology Initiative. Efforts begun in prior years under the URI Support Program are being completed. ($54.806 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

(U) FY2002 Plans:

- Research. The Services are conducting a competition for new multidisciplinary research efforts in nineteen high-priority basic research areas related to the following broad themes: energetics; multifunction materials; sensing; nanotechnology; control of adaptive and cooperative systems; and interoperable, adaptive, and scalable networks. Multidisciplinary and PECASE programs begun in prior years will continue, with new competitive awards under the PECASE program. ($149.756 million)

- Education. A FY 2002 competition will be conducted to award approximately 285 graduate fellowships under the National Defense Science and Engineering Graduate Fellowship Program. ($40.920 million)

- Infrastructure. A FY 2002 competition will be conducted for new awards under the DURIP program. ($49.698 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

(U) **ACQUISITION STRATEGY:** Not Applicable

(U) B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	224.016	253.627	217.549	Continuing
Appropriated Value		295.077		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	-0.650	-2.135	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	-0.656	0.000	
c. Other	0.000	0.000	22.825	
Current President's Budget	223.366	292.286	240.374	Continuing

Change Summary Explanation:

(U) **Funding:** FY 2000 and FY 2001 adjustments reflect Congressional undistributed reductions and a reprogramming action included in the FY2000 omnibus reprogramming request

(U) **Schedule:** Not applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	R-1 ITEM NOMENCLATURE UNIVERSITY RESEARCH INITIATIVE PE 0601103D8Z

(U) **Technical:** Not applicable.

(U) **C. Other Program Funding Summary Cost** Not applicable.

(U) **D. Schedule Profile** Not applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1							R-1 ITEM NOMENCLATURE Force Health Protection Research **PE 0601105D8Z**			
COST *(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	24.645	29.366	26.952						Continuing	Continuing
Gulf War Illnesses Research/P105	24.645	29.366	26.952						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) This program of Force Health Protection Research addresses topics relevant to identifying the etiology and treatment of Gulf War illnesses (GWI), increasing our understanding of issues pertinent to Force Health Protection, and enhancing the protection of Service members against deployment-related health threats in future deployments. This program is conducted in coordination with the Research Working Group of the interagency Military and Veterans Health Coordinating Board.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Force Health Protection Research **PE 0601105D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	24.645	29.366	26.952						Continuing	Continuing
Gulf War Illnesses Research/P105	24.645	29.366	26.952						Continuing	Continuing

(U) Project Number and Title: P105 Gulf War Illnesses Research

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Continued projects in neurobiology of stress, deployment toxicology methods, operational interactions of medical materiel, and force health protection epidemiology. Competitively funded new projects to address issues raised by emerging finding from existing research and other discoveries. Specific findings are summarized for more than 100 DoD-sponsored projects in the Annual Report to Congress. ($ 11.967 million)

(U) Provided program management, contract servicing, and supplemental funding to previously funded GWI research studies. ($ 6.196 million)

(U) Initiated a 2-year Medical Follow-up Agency (Institute of Medicine) study of prewar healthcare-seeking behaviors of Gulf War veterans and subsequent health outcomes($ 1.232 million)

(U) Continued development of diagnostic methods and treatments for Leishmania. Successfully demonstrated the feasibility of serological diagnostic tests in a program conducted by Army and Navy infectious disease research laboratories. ($ 1.500 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Force Health Protection Research **PE 0601105D8Z**

(U) Continued a tri-Service epidemiological research effort at the Naval Health Research Center involving deployment health assessments, and completed a comprehensive scientific peer review of the program.($ 1.750 million)

(U) Initiated an effort (reported as a Defense Technology Objective) on health behavior interventions research intended to develop and demonstrate efficacy of programs to enhance deployment readiness. That effort included successful testing of a program to reduce unintended pregnancy and STDs in Marine Corps recruits.($ 2.000 million)

(U) FY 2001 Plans:

(U) Initiate new projects in neurobiology of stress, deployment toxicology methods, health risks of heavy metals that may be used in munitions and armor, and force health protection epidemiology. Competitively fund new projects to address issues raised by emerging findings from existing research and other discoveries. ($ 9.804 million)

(U) Congressional add for research($ 12.712 million)

(U) Continue program on Health Behaviors Interventions Research with multi-Service studies on weight management. ($ 2.000 million)

(U) Continue development and complete milestone zero decisions on Leishmania diagnostics and treatments. ($ 1.500 million)

(U) Continue an expanded Tri-Service epidemiological research effort at the Naval Health Research Center involving deployment health assessments including initiation of the Millenium Cohort Study.($ 1.750 million)

(U) Provide program management, contract servicing, and supplemental funding to previously funded GWI research studies. ($ 1.600 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Force Health Protection Research **PE 0601105D8Z**

(U) FY 2002 Plans:

(U) Continue projects in neurobiology of stress, deployment toxicology methods, health risks of heavy metals that may be used in munitions and armor, and force health protection epidemiology.($ 12.000 million)

(U) Continue program on Health Behaviors Interventions Research with multi-Service studies on weight management. ($ 7.000 million)

(U) Continue an expanded Tri-Service epidemiological research effort at the Naval Health Research Center involving deployment health assessments, including continuation of the Millenium Cohort Study.($ 1.750 million)

(U) Continue development of Leishmania treatments.($ 1.500 million)

(U) Provide program management, contract servicing, and supplemental funding to previously funded GWI research studies. ($ 4.702 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Force Health Protection Research **PE 0601105D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	24.543	16.978	16.856	Continuing
Appropriated Value	0.000	27.978	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.196	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.694	0.000	0.000	
c. Other	0.000	0.000	0.000	
President's Budget Submission	24.645	29.366	26.952	Continuing

Change Summary Explanation

(U) **Funding**: FY 2000 reductions are due to inflation adjustments and government-wide rescission. FY 2001 reductions reflect Section 8086 adjustments. FY 2002 reflects increases in the Amended President's Budget for force health protection research.

(U) **Schedule**: N/A

(U) **Technical**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Force Health Protection Research **PE 0601105D8Z**

(U) C. OTHER PROGRAM FUNDING SUMMARY COST: N/A

(U) D. ACQUISITION STRATEGY: N/A

(U) E. SCHEDULE PROFILE: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1							R-1 ITEM NOMENCLATURE High Energy Laser Initiative **PE 0601108D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	11.877						Continuing	Continuing
High Energy Laser/P108	0.000	0.000	11.877						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) This program element funds basic research aimed at developing fundamental scientific knowledge to support future DOD high-energy-laser (HEL) systems. HEL weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, nearly unlimited magazine depth, low cost per kill, and reduced logistics requirements because of no need for stocks of munitions or warheads. As a result, HELs have the potential to perform a wide variety of military missions, including some that are impossible, or nearly so, for conventional weapons. These include interception of ballistic missiles in boost phase, defeat of high-speed, maneuvering anti-ship and anti-aircraft missiles, and the ultra-precision negation of targets in urban environments with no collateral damage. Research conducted under this program element develops the technology necessary to enable these and other HEL missions.

(U) This program element is part of an overall DOD initiative in HEL science and technology being conducted by the recently formed HEL Joint Technology Office (JTO). The goals of this HEL JTO funded research are to provide the technology to make HEL systems more effective and also to make them lighter, smaller, cheaper, and more easily supportable on the battlefield. In general, efforts funded under this program element are chosen for their potential to have major impact on multiple HEL systems and on multiple Service missions. As a result of this focus and of close coordination with the military departments and defense agencies, this program element complements other DOD HEL programs that are directed at more specific Service and agency needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

(U) A broad range of technology is addressed in key areas such as chemical lasers, solid-state lasers, beam control, optics, propagation, and free-electron lasers. Research is conducted principally by universities, but also by Government laboratories and industry. The program element funds theoretical, computational, and experimental investigations. In many cases, these three types of investigations are combined under a single effort, thereby creating synergistic effects between various scientific approaches, and greatly enhancing the potential for making important breakthroughs in HEL-related technologies. DOD intends to translate the knowledge developed under this program element into proof-of-concept solutions to broadly defined HEL-related military problems as part of further laboratory experiments and field-testing.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	11.877						Continuing	Continuing
High Energy Laser /P108	0.000	0.000	11.877						Continuing	Continuing

(U) Project Number and Title: P108 High Energy Laser

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Accomplishments:

(U) None; this program element is a new initiative as of FY 2002.

(U) FY 2002 Plans:

(U) Funds will be used to support university-led multidisciplinary basic research in areas applicable to DOD's HEL program. Each research topic will be investigated by one or more teams of researchers representing different academic disciplines. The projects will be closely monitored by the military departments and defense agencies for breakthrough advances that can be rapidly transitioned to DOD HEL applied-research and advanced-technology-development programs. Using a competitive process designed to select only the highest payoff proposals, DOD intends to fund six topic areas:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

- (U) Fundamental research in solid-state lasers. This research will seek to develop the scientific knowledge needed for revolutionary advances in fieldable high-brightness and high-power diode-pumped solid-state lasers. Over the long term, solid state lasers, because they run on electricity, promise to greatly simplify logistics requirements. Achieving this promise, however, requires that cost, power, and efficiency barriers be breached. To enable these developments, research areas of interest include laser materials with large fluorescence lifetime and cross-section and the ability to operate at high temperatures, athermal laser gain media, modular and scalable architectures for laser power scaling, means of increasing efficiency to in excess of 20%, operation in harsh environments, and corrections for thermally induced distortions in gain media.
- (U) Fundamental research in affordable HEL fiber-laser modules. This research will examine the scientific concerns involved in developing and producing low-cost, manufacturable modules in the 100 Watt to kilowatt range and in developing methods to combine modules to achieve the weapons power levels. The focus on affordability could lead to drastic reductions in acquisition cost for future HEL systems. Areas of interest include laser materials and devices, nonlinear optical phenomena at high power levels, reliable and low-cost design techniques, and integrated optics and beam/pulse forming.
- (U) Fundamental research in modeling, design, and simulation of beam-control systems for military HEL applications. This research will examine the scientific concerns associated with atmospheric beam control, to include characterization efforts in aerial, battlefield, and maritime-like environments. These efforts could lead to substantial increases in the lethality of HEL systems without the need for ever-higher power levels. Areas of interest include improved theoretical and computer-based analysis of propagation effects, advanced wavefront sensing and reconstruction (especially in the presence of thermal blooming), the effects of extended reference sources used for wavefront correction, and new concepts for effective wavefront sensing and correction, especially under high-scintillation conditions.
- (U) Fundamental research in high power, lightweight optics. This research will attempt to establish a multidisciplinary program that addresses advanced technological elements and concepts relevant to the development of lightweight optics for HEL systems. This research will be aimed at greatly reducing weight while simultaneously improving performance and reducing cost, issues of importance to all potential military HEL systems, particularly space-based systems. Areas of interest include basic materials and fabrication techniques, large optics lightweight structure and deployment concepts, HEL optical coatings, multipurpose materials (e.g., wavefront correction combined with aperture adjustment), and control mechanisms.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

- (U) Fundamental research in chemical lasers. This research will focus on improved understanding of the processes necessary for the realization of truly closed cycle, lightweight, high-power, continuously operating chemical lasers. A completely closed cycle chemical-laser HEL weapon would require only electrical power and not expensive, heavy exhaust systems or chemical supplies, thereby capitalizing on the high efficiencies inherent in the chemical-laser process, while enhancing supportability. Areas of interest include studies of chemical processes and reactions for a closed-cycle chemical-laser system, new sources of the high-energy chemical species needed to produce the lasing event, and novel recovery systems for regeneration of the laser fuels.
- (U) Fundamental research in high-average-power ultra-short-pulse free-electron lasers (FELs). This research will advance the average power obtainable by ultra-short-pulse FELs significantly over the current state-of-the-art, while increasing efficiency and lethality and decreasing relative size and cost, thus enhancing opportunities for eventual weaponization of FELs for military applications. Areas of interest include high-current devices and control methods, higher damage threshold resonator optics, advanced optical cavity designs for high power and compact spaces, design methods for scaling FELs to reach multi-megawatt class average power levels.

(U) Funds from this program element will also support research on specific HEL-related problems for which fundamental scientific research promises to offer innovative and revolutionary solutions, and which are amenable to solution by a small team from a single academic discipline. The areas of interest include, but are not limited to: beam-control theory, propagation analysis and measurement, chemical-laser mixing and diagnostics, solid-state-laser materials and design concepts, modeling and simulation of HELs, and education and training of HEL scientists and engineers for public and private-sector service.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**						**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000						
Appropriated Value	0.000	0.000	0.000						Continuing
Adjustments to Appropriated Value									
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000						
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000						
c. Other	0.000	0.000	11.877						
Current President's Budget	0.000	0.000	11.877						Continuing

Change Summary Explanation

(U) **Funding**: PE 0601108D8Z is a new PE established for FY 2000-2007 to better balance research in new revolutionary laser technology with large demonstration programs.

(U) **Schedule**:

(U) **Technical**:

(U) C. OTHER PROGRAM FUNDING SUMMARY COST:

(U) D. ACQUISITION STRATEGY:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** High Energy Laser Initiative **PE 0601108D8Z**

(U) E. SCHEDULE PROFILE:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1							R-1 ITEM NOMENCLATURE Government/Industry Co-sponsorship of University R **PE 0601111D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	6.142	6.654	3.421						Continuing	Continuing
GICUR/P111	6.142	6.654	3.421						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) A shared commitment between industry and Government continues to be created via the Government/Industry Co-sponsorship of University Research (GICUR) program. It will capitalize on university based research, education and training in technologies of strategic importance to national defense and also to industry. It provides an emphasis on ground-breaking research with a long-term horizon, and education and training in selected research areas which are vital to advancement of technologies. The ommitment is a jointly formed pool of funding and a shared management structure for sponsoring this sort of long term basic research at universities. This will provide the military with leading-edge technologies as well as reducing vulnerabilities of industries involved, increase long-term technical growth in these areas, infuse new ideas and approaches, all of which are important for national security. Industry and government share responsibility for research focus area selection and overall direction. This program will also employ advances in information technologies and telecommunications to provide extensive connectivity among the partners and research performers from the outset. Thus, strengths of individual investigators can be effectively linked, taking advantage of geographically disbursed national resources. Mechanisms will be established for personnel exchange and interactions to provide for continuing education of highly qualified researchers already working in leading edge and emerging S&T. One program area implemented is on Complex Adaptive Networks. It meets the program criteria and is vital to DoD needs. The high priority thrust in this area is providing powerful mathematical and computer modeling methods to steer technology such that cascading effects and rapid, catastrophic failure of networks (e.g., battlefield communications, electrically powered ships, multisensor surveillanc/integration) are avoided. The results are of extreme importance for the Critical Infrastructures Protection national need. The second area implemented very strongly

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Government/Industry Co-sponsorship of University R **PE 0601111D8Z**

(U) emphasizes basic concepts for DoD needs in high frequency applications such as radars, millimeter/microwave communications and radiometry, with special attention to devices fabricated from compound semiconductors, such as gallium arsenide. This thrust is unique to DoD. The thrust is by no means limited to silicon-based CMOS (complementary metal oxide silicon) digital topics. Research here is aimed at breakthroughs to enable rapid, correct, verifiable, implementable designs of complex circuits. Interconnect research will include causes of delays and performance limits as features become smaller (for higher speed). Higher conductivity metals and very low dielectric constant materials will be investigated, as will non-conventional, innovative fabrication processes beyond present vision. These areas require truly innovative research.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Government/Industry Co-sponsorship of University R **PE 0601111D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	6.142	6.654	3.421						Continuing	Continuing
GICUR/P111	6.142	6.654	3.421						Continuing	Continuing

(U) Project Number and Title: P111 GICUR

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Continue research through the Semic onductor Focus Research Initiative and the Complex Interactive Network/ Systems projects. For complex adaptive networks, mathematical and computer modeling methods developed will be tested against real world data and situations. For complex circuits, advance design concepts and interconnect schemes will be expressed in prototype devices. For smart structures and smart materials, opportunities will be identified to take concepts and methods achieved and use them in environments which could provide indicators for reliability advances. ($ 6.142 million)

(U) FY 2001 Plans: (U) Continue research in semiconductor. Theoretical and experimental achievements will be fully documented. Research will continue along lines both needs and opportunity driven, dependent upon success to date.($ 6.654 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Government/Industry Co-sponsorship of University R **PE 0601111D8Z**

(U) FY 2002 Plans:

(U) In cooperation with the Microelectronics Advanced Research Corporation (MARCO) the Semiconductor Electronics Microelectronics project funds two university research centers. The University of California at Berkley leading a team of eight other universities performing research into "Design and Test" technologies for the Giga-scale semiconductor integrated circuit. Georgia Tech leads a team of seven universities for research into "Interconnect" technologies to solve the impending materials, processes, and architecture challenges in connecting billions of devices. Under MARCO the electronics Industry provides at least three dollars for each dollar provided by DoD.($ 3.421 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Government/Industry Co-sponsorship of University R **PE 0601111D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	6.175	6.715	6.838	Continuing
Appropriated Value	0.000	6.715	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.033	-0.061	0.000	
c. Other	0.000	0.000	-3.417	
Current President's Budget	6.142	6.654	3.421	Continuing

Change Summary Explanation

(U) **Funding**: FY 2000 reductions are due to reprogramming adjustments. FY 2001 reductions reflect Section 8086 adjustments.

(U) **Schedule**: N/A

(U) **Technical**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Government/Industry Co-sponsorship of University R **PE 0601111D8Z**

(U) C. OTHER PROGRAM FUNDING SUMMARY COST: N/A

(U) D. ACQUISITION STRATEGY: N/A

(U) E. SCHEDULE PROFILE: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1							R-1 ITEM NOMENCLATURE Defense Experimental Program to Stimulate Competit **PE 0601114D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	21.797	9.901						Continuing	Continuing
DEPSCoR/P104	0.000	21.797	9.901						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) Defense Experimental Program to Stimulate Competitive Research (DEPSCoR). The DEPSCoR is a legislated program that helps build national infrastructure for research and education by funding research activities in science and engineering fields important to national defense. Participation in this program is limited to states that meet eligibility criteria as set forth in the authorizing language. The program is intended to improve the capabilities of institutions of higher education (IHE) to develop, plan and execute science and engineering research that is competitive under the peer-review system. IHEs in eligible states are invited, through their NSF State EPSCoR Committee, to compete for research/infrastructure awards in areas identified by the department in broad agency announcements regularly published by the Services.
(U)DEPSCoR was previously funded in the University Research Initiative Program (PE 0601103D8Z).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Defense Experimental Program to Stimulate Competit **PE 0601114D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	21.797	9.901						Continuing	Continuing
DEPSCoR/P104	0.000	21.797	9.901						Continuing	Continuing

(U) Project Number and Title: P104 DEPSCoR

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) • Reported under PE 0601103D8Z

(U) FY 2001 Plans:

(U) Research. This is a congressionally mandated program that will continue to be conducted in a manner that is consistent with the goals established in the authorizing legislation and at a level of performance directly proportional to the funding that is annually adjusted by Congress. Research proposals from eligible states will be competitively selected for funding.($ 21.797 million)

(U) FY 2002 Plans:

(U)Research. This is a congressionally mandated program that will continue to be conducted in a manner that is consistent with the goals established in the authorizing legislation and at a level of performance directly proportional to the funding that is annually adjusted by Congress. Research proposals from eligible states will be competitively selected for funding.($ 9.901 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Defense Experimental Program to Stimulate Competit **PE 0601114D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	0.000	9.859	9.845	Continuing
Appropriated Value	0.000	22.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	-0.203	0.056	
c. Other	0.000	0.000	0.000	
Current President's Budget	0.000	21.797	9.901	Continuing

Change Summary Explanation

(U) Funding: DEPSCoR was previously funded in the University Research Initiative (PE 0601103D8Z). FY 2001 reductions reflect Section 8086 adjustments.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 1	**R-1 ITEM NOMENCLATURE** Defense Experimental Program to Stimulate Competit **PE 0601114D8Z**

(U) **Schedule**: N/A

(U) **Technical**:

(U) **C.** **OTHER PROGRAM FUNDING SUMMARY COST**: N/A

(U) **D.** **ACQUISITION STRATEGY**: N/A

(U) **E.** **SCHEDULE PROFILE**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2							R-1 ITEM NOMENCLATURE Medical Free Electron Laser **PE 0602227D8Z**			
COST *(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	11.556	19.845	14.660						Continuing	Continuing
MFEL/P483	11.556	19.845	14.660						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) The MFEL program seeks to develop advanced, laser-based applications for military medicine and electronic materials research. Free electron lasers (FELs) provide unique pulse features and tunable wavelength characteristics that are unavailable in other laser devices. Thus, FELs broaden the experimental options for the development of new laser-based medical technologies.
(U) The majority of this program is focused on developing advanced procedures for rapid diagnosis and treatment of battlefield-related medical problems. Specific applications under investigation include soft tissue repair, hard tissue surgery, therapies for thermal and chemical burns, warfighter vision correction, and enhanced medical imaging. Laser applications will be clinically tested in unique program medical centers, leading to Food and Drug Administration (FDA) approval. There is high potential dual use for civilian medicine. Thus far, more than 30 clinical procedures have been developed in several medical specialties, including ophthalmology, orthopedics, thermal and chemical burn repair, and neurosurgery.
(U) A small part of this program is focused on electronic materials research. In this research, the high energy FEL beam is exploited for improved processing applications including more effective microstructure, surface cleaning and modification of transport properties of microelectronic substrates

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2	**R-1 ITEM NOMENCLATURE** Medical Free Electron Laser **PE 0602227D8Z**

(U) The program is executed primarily extramurally, but a small amount of funding is awarded to DOD medical centers to facilitate technology transfer. Performers include 5 major university medical centers and approximately 10 applications groups. Awards are made competitively, following solicitation and peer review, for performance periods of up to 3 years. The program emphasizes the use of interdisciplinary teams of physicians, physicists, biologists, and engineers and collaborative interactions among the major MFEL centers.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2	**R-1 ITEM NOMENCLATURE** Medical Free Electron Laser **PE 0602227D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	11.556	19.845	14.660						Continuing	Continuing
MFEL/P483	11.556	19.845	14.660						Continuing	Continuing

(U) Project Number and Title: P483 MFEL

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) A competition for medical center awards was conducted during 1999 for awards beginning in FY 2000. Increased emphasis is being placed upon transition of research products for combat casualty care and military trauma centers by establishing collaborative projects between military medical sites and research centers funded under the program. Specific studies have included work to develop Optical Doppler Tomography to image in vivo blood flow, the development of two photon microscopy and OCT birefringence for cellular imaging of wounds and wound repair dynamics, successful use of an FEL for surgery on a lesion in a human brain, the development of methods for the specific photoinactivation of bacteria in wounds, new wound closure methods for delicate tissues such as those of the eye using photosensitive dye crosslinking, and development of a system based on Compton scattering for generation of monochromatic, tunable x-rays for use in medical imaging.($ 11.556 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2	**R-1 ITEM NOMENCLATURE** Medical Free Electron Laser **PE 0602227D8Z**

(U) FY 2001 Plans:

(U) Newly completed center awards will be in place for their first full year of funding. Emphasis will continue to be on military relevant laser medicine with increasing focus on endoscopic imaging for rapid battlefield diagnostics and wound diagnostics and treatment. Studies of the special problems associated with laser vision correction, exacerbated by a variety of the special demands of military operations, will be enhanced, as will means to alleviate such problems. Military relevant medical procedures introduced under this program will continue to be evaluated by, and transferred to, military medical centers, and the special capabilities and facilities available at such centers will be used extensively. ($ 19.845 million)

(U) FY 2002 Plans:

(U) Center awards funded during the previous year will continue, with their primary focus continuing to be on militarily relevant laser medicine applications. Procedures developed under this program will continue to be evaluated for transfer to clinical application in the various military medical centers. Collaborative efforts with military combat casualty care research facilities will continue to be used to facilitate transfer of new methodologies. New research efforts will expand center programs with new applications for combat casualty care using innovative laser technologies not previously used. ($ 14.660 million).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2	**R-1 ITEM NOMENCLATURE** Medical Free Electron Laser **PE 0602227D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	11.525	15.029	9.660	Continuing
Appropriated Value	0.000	20.029	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.140	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.031	-0.044	0.000	
c. Other	0.000	0.000	5.000	
Current President's Budget	11.556	19.845	14.660	Continuing

Change Summary Explanation.

(U) Funding: FY 2000 reflects adjustments for reprogrammings. FY 2001 reductions reflect Section 8086 adjustments. FY 2002 increase to fund new technologies in combat casualty care.

(U) Schedule: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA2	**R-1 ITEM NOMENCLATURE** Medical Free Electron Laser **PE 0602227D8Z**

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2							R-1 ITEM NOMENCLATURE Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	15.743	22.031	14.484						Continuing	Continuing
HBCU/P489	15.743	22.031	14.484						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) P2228D, Historically Black Colleges and Universities and Minority Institutions (HBCU/MI). The HBCU/MI program provides infrastructure support in fields of science and engineering that are important to national defense. The DoD Infrastructure Support Program is the only program that encourages participation of small minority schools as well as research institutions. This competitive program provides support through grants or contracts for research, collaborative research, education assistance, instrumentation purchases, and technical assistance. This project competitively supports programs at minority institutions nationwide in the following areas:

- Research. The research grants are to further the knowledge in the basic scientific disciplines through theoretical and empirical activities. Collaborative research allows university professors to work directly with military laboratories or other universities.

- Education. Education assistance funds are used by the selected institutions to strengthen their academic programs in science, mathematics, and engineering thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields. These grants provide equipment, scholarships, cooperative work/study opportunities, visiting faculty programs, summer programs, and a variety of other enhancements designed to support students and to encourage them to pursue careers in science, mathematics, and engineering.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2	**R-1 ITEM NOMENCLATURE** Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**

- Infrastructure. Funds for instrumentation allow institutions to increase their capability to perform research of interest to the Department. This program allows the university to purchase from basic laboratory equipment for education program enhancements to highly sophisticated research instruments, such as lasers and spectrometers.

- Technical assistance. These funds are used to design programs to enhance the ability of minority institutions to successfully compete for future Defense funding. The objective is to assist the HBCU/MI community in areas such as proposal writing and administration of grants and contracts.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2	**R-1 ITEM NOMENCLATURE** Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	15.743	22.031	14.484						Continuing	Continuing
HBCU/P489	15.743	22.031	14.484						Continuing	Continuing

(U) Project Number and Title: P489 HBCU

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Continue evaluation of the awards made with the prior year funds. In FY 2000 the HB CU/MI program made 31 awards using the program funds. These 31 awards include twenty-six instrumentation grants and five research grants related to: infrared cameral system for solar physics research, detection of incipient metal corrosion and cracking beneath paints using near infrared ultrafast photonic techniques; low loss, low intermodulation distortion materials, devices, and circuits for use in frequency agile microwave systems; visualization, modeling and simulation instrumentation; greenhouse equipment for teaching and research; composite isogrid structure for space applications; and hands-on environmental education using modern analytical equipment. Among the awardees were thirteen historically black colleges and universities, thirteen Hispanic-Serving Institutions, and five other minority institutions. These awards were a combination of new starts, and continuations of some grants and other efforts started under previous fiscal years depending on technical progress. The Services selected the competitive awards from proposals submitted under the Infrastructure Support Program for HBCU/MIs: FY 2000 broad agency announcement distributed in September 1999. To date, 7 competitions have resulted in 211 Instrumentation grants, 27 research grants, 20 education awards, 9 education centers and 2 technical assistance awards. ($ 15.743 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2	**R-1 ITEM NOMENCLATURE** Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**

(U) FY 2001 Plans:

(U) Continue evaluation of the awards made with prior year funds. FY 2001 competitions for new minority research, education, infrastructure efforts are being conducted. In FY 2001, the HBCU/MI program will make additional awards using the program funds. These awards will be a combination of new starts, and continuations of some grants and other efforts started under previous fiscal years depending on technical progress. The Services will select the competitive awards from proposals submitted under the Infrastructure Support Program for HBCU/MIs: FY 2001 broad agency announcement distributed in October 2000. FY 2001 program also contains two congressional adds ($3.000 Million) for Tribal Colleges and Universities and ($5.000 Million) for Hispanic Service Institutions, which resulted in two additional/new broad agency announcements. These awards will be made for instrumentation for research and education programs, research, undergraduate scholarships and graduate fellowships.
($ 22.031 million)

(U) FY 2002 Plans:

(U)Continue evaluation of the awards made with prior year funds. In FY 2002, the HBCU/MI program will make additional awards using the program funds. These awards will be a combination of new starts, and continuations of some grants and other efforts started under previous fiscal years depending on technical progress. The Services will select the competitive awards.($ 14.484 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2	**R-1 ITEM NOMENCLATURE** Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	15.747	14.236	14.402	Continuing
Appropriated Value	0.000	22.236	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.205	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.004	0.000	0.082	
c. Other	0.000	0.000	0.000	
Current President's Budget	15.743	22.031	14.484	Continuing

Change Summary Explanation

(U) Funding: FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA2	**R-1 ITEM NOMENCLATURE** Historically Black Colleges and Universities (HBCU) **PE 0602228D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE JUNE 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2							R-1 ITEM NOMENCLATURE Lincoln Laboratory **PE 0602234D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	20.081	19.917	21.969						Continuing	Continuing
Lincoln Laboratory/P534	20.081	19.917	21.969						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)The Lincoln Laboratory (LL) program is a high technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). LL is operated as a FFRDC administered by the DoD, and is unique among DoD FFRDCs. It has no funding sources other than the Line for its innovative research and development efforts. This is due to the fact that LL is operated by MIT at no fee and may not charge for IR&D (under A-21). Other DoD FFRDCs do charge a fee with which they may support research efforts.

(U)The LL Line funds research activities that directly lead to the development of new system concepts, new technologies, and new components and materials. Historically, the Line funding supported many development and demonstration programs which have led to such significant DoD systems as JSTARS, MILSTAR, GEODSS, as well as to solid-state devices and processes of major importance to the military industrial base. In addition to being the foundation for many new LL programs, the Line also supports other ongoing Laboratory programs with state-of-the-art technology developments. The program has the following 4 research elements:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

- Target surveillance and recognition, with emphasis on (1) revolutionary sensing techniques and algorithms for detecting and recognizing battlefield targets both in the clear and in difficult deployments, (2) supporting data collection and phenomenology, (3) fundamental target-recognition bounds and their implications for sensor and algorithm design, and (4) revolutionary new approaches for automated passive sonar target classification of submarine targets and discrimination of submarines from surface ship clutter.
- High-connectivity, low-cost military global defense network and communications systems, with emphasis on new antennas, RF technology, network protocols (including for mobile users with lightweight transceivers), high-rate fiber and free-space optical communications systems, and the interconnection of these very disparate modalities into a global defense network that can truly realize the vision of a `from sensor to shooter` communications infrastructure which will greatly enhance force effectiveness by providing the right information at the right time anywhere in the world;
- Advanced combat support technologies for active hyperspectral sensing systems and compact biological agent detection systems. The focus in biological agent detection is in developing technology for compact, lightweight, real-time biological-agent sensors with extremely high sensitivity (< 1 agent containing particle per liter of air) and with strong background clutter rejection for extremely low false-alarm rate (< 1 per week). The primary objective for the active hyperspectral sensing system development is to demonstrate the feasibility and utility of combining active illumination with hyperspectral imaging for a range of military applications including CID.
- Revolutionary, advanced electronic/optical technology, with specific emphasis on optical sampling for direct analog-to-digital conversion on the microwave carrier in digital receivers for radar and electronic intercept, 3-D imaging and high sensitivity IR focal-plane arrays for advanced missile seekers, mid-infrared semiconductor lasers to counter advanced heat-seeking missiles, new miniature fluorescent and microfluidic sensors for rapidly detecting and identifying low concentrations of biowarfare agents, solid state low-light imagers for improved night vision under starlight illumination, and high-speed, radiation hard, ultra-low power analog and digital circuits for ubiquitous DoD applications.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	17.081	19.917	21.969						Continuing	Continuing
Lincoln Laboratory/P534	17.081	19.917	21.969						Continuing	Continuing

(U) Project Number and Title: P534 Lincoln Laboratory

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Target Surveillance and Recognition:

(U) Surface Surveillance:

(U) Extend fundamental target-recognition bounds to multi-look, multi-frequency and polarimetric sensing. Initiate formulation and analysis of multi-sensor concepts for high-performance, resource-efficient wide-area battlefield target recognition. Continue theoretical and experimental investigation of sparse-array techniques for active seismic imaging of underground facilities. In addition to being directly applicable to ongoing R&D efforts such as DARPA`s MTE, MSTAR and underground-facilities programs, these activities will have considerable significance for organizations, such as NIMA, NRO and the Services, that are planning and developing next-generation sensing and exploitation systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Space Surveillance

(U) Continue 3-D laser radar technology development with the final hybridization of 32 x 32 avalanche photo-diode (APD) arrays with arrays of CMOS timing electronics. These arrays will be incorporated into the brassboard system for the demonstration of single-photon-sensitivity 3-D imaging for advanced BMD and tactical seekers. Begin the development of APD arrays, which are sensitive at 1.5-micron wavelengths, for use with eyesafe laser transmitters. This will include the development of single-element and small arrays of diffusion-bonded structures utilizing an InGaAs absorption region and a silicon avalanche region. These APD arrays will be compatible with the co-developed CMOS timing circuitry and will enable 3-D laser radar systems for use in combat-identification and vehicle-navigation applications as well as tactical seekers in urban environments where laser eyesafety is a requirement. Begin the development of a laser-transmitter system that incorporates the multi-functional capability of 3-D laser radar and laser-vibration sensing. This system would incorporate APD arrays for the 3-D imaging along with a long-coherence-time mode-locked laser transmitter, which would allow coherent detection for vibration measurements and has applications in combat identification.

(U) Sonar Target Classification Continue to investigate the benefit of improved front end beamforming techniques but focus more on the impact of improved features on classifier and overall system performance. Explore and demonstrate adaptive techniques for array calibration to improve sonar performance during ownship maneuvers. Strong interfering surface ships can serve as sources of opportunity that can be used to automatically calibrate or estimate array shape. The estimated shape will then be used directly within the beamformer to improve target SNR.($ 4.172 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Military Communications:

(U) Continue to investigate technology for global high-rate military communications and networking at rates from tens of megabits to tens of gigabits per second, including optical communications and tactical theater communications (particularly to Army forces on the move). Global ultra-high-rate networking: Initial implementation of ultra-high-rate optical network from Lincoln Laboratory to Washington, DC under funded programs; will be available for demonstrations of line-funded fiber optic communications techniques. Demonstrate 100 Gbps packet assembly, transmission and reception over optical fiber in laboratory testbed. Develop novel applications using high-speed optical backbones such as cooperative processing of radar data and other applications. Tactical Satellite Terminals: Complete transfer of technology of optically controlled phased array antennas into funded radar and communication programs.

(U) Defensive Information Warfare: Bottleneck Verification System will be further refined and evaluated, then will be extended beyond looking for illegal user-to-root transitions to other attack classes and mechanisms. This technology will be transferred to AFWIC for deployment over a wide range of Air Force base computer networks. The set of information assurance components in the yearly product evaluation will be extended to encompass protection (e.g. firewalls) and reaction (e.g. security service desks) subsystems in addition to ID subsystems. Begin development of systems that can identify and not merely detect intrusion attacks. ($ 3.656 million)

(U) Combat Support Technology:

(U) Active Hyperspectral Sensing Systems: Extend the operating spectral region of both the white light `laser` and the spectral imaging systems from VIS/NIR to encompass 3 to 5 micron bands. Continue processing algorithm development in order to identify key features for target recognition and visualization using the extended sensing capability. This system will continue to be tested in both laboratory and field environments on a variety of targets and scenarios of military interest. Design of a full-spectral system, spanning the visible through infrared bands will be initiated and the factors affecting fusion with other sensing systems, such as synthetic-aperture radar and other EO sensors, will be examined.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Biological Agent Detection Systems: The work will begin to focus on a miniature, low-power sensor incorporating a UV fluorescence sensor at the front end, a B-cell-based identifying sensor at the back end, and stages of intelligent particle sampling and sample purification in the middle. For the UV sensor, work will continue on reducing the laser power requirements, and work will begin on aggressively miniaturizing the sensor. Development will begin on a fully intelligent, integrated particle sampler and on the microfluidic sample-purification sub-system. Modeling and sisimulation efforts will continue with emphasis on how the integrated sensor would perform in urban environments. In addition, work will continue on cartridge-based soil measurements and on background measurements. These technology efforts will flow into the Joint Biological Point Detection System (JBPDS) and into the Joint Biological Remote Early Warning System (JBREWS) ACTD.($ 4.536 million)

(U) Advanced Electronics Technology: Extend direct RF optical sampling to bandwidths beyond 100 MHz by demonstrating scalable methods for parallelizing quantizers: Begin system demonstration of utility of optical sampling for digital receivers at radar field site. Improve materials and spectral combining techniques enabling higher-brightness and higher-operating-temperature optically pumped mid-IR semiconductor lasers for IRCM applications. Reduce dark current levels and develop CMOS-based versions of visible, UV and IR focal planes in support of AF, DARPA, and other DoD programs. Continue development of advanced silicon process technology with extensions of CMOS to sub-100-nm feature sizes, with emphasis on development of technologies for on-focal-plane processing, radiation-hard technologies, and integrated sensors. Continue development of tunable superconductive RF filters for frequency-agile receivers. Demonstrate 4-GHz bandwidth ELINT receiver incorporating superconductive chirp filters and CMOS/SOI data processor. Continue development of bio-detector technology based on integration of living biological cells with microfluids and microelectronics with emphasis on discrimination and identification methodologies. Demonstrate 3-D radar subsystem incorporating a 32x32 array of geiger-mode avalanche photodiodes (APD), integrated timing electronics, and compact laser illuminator. Demonstrate APD arrays for use at eye-safe wavelengths applications. Demonstrate microelectromechanical (MEM) RF tuning structures for electronically reconfigurable microwave receivers and antennas. Initiate development of AlGaN UV detectors for solar- blind applications.($ 4.717 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) FY 2001 Plans:

(U) Target Surveillance and Recognition:

(U) Surface Surveillance:

(U) Develop and apply absolute (vs. relative, between two sensor designs) fundamental ATR performance bounds. Apply multi-sensor ATR concepts to development of practical multi-sensor ATR architectures for high-performance, resource-efficient, wide-area battlefield target recognition. Design field experiments to demonstrate such architectures. Refine techniques for sparse-array active seismic imaging and demonstrate an existing underground facility. In addition to being directly applicable to ongoing R&FD efforts such as DARPA`s MTE and MSTAR programs, these activities will have considerable significance for organizations, such as NIMA, NRO and the Services, that are planning and developing next-generation sensing and exploitation systems.

(U) Space Surveillance:

(U) Continue 3-D laser radar technology development with the scaling of the array sizes to greater than 32 x 32 pixels. These larger arrays will have applications for advanced BMD and tactical seekers and ground mapping and foliage penetration. Continue the development of 1.5-micron-sensitive APD arrays with the scaling of the single-element and small arrays to 32 x 32, or larger, array sizes. These devices will enable the single-photon-sensitive 3-D laser radar technologies to be used in the eyesafe regime for applications such as combat identification and tactical seeker homing in urban environments. Continue the development of multi-function laser transmitters, which are capable of 3-D imaging and laser-vibration sensing, for applications of combat identification and underground-structure sensing.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Sonar Target Classification Expand application of IPAC classification approach beyond submarine towed array sonars to the fixed (SOSUS) and mobile (SURTASS) surveillance problems. Develop techniques for operator in-situ training and test with field data. Develop dynamic databases to permit sonar to exploit knowledge of environment, intelligence information, external sensor data on surface ship clutter.($ 4.078 million)

(U) Military Communications:

(U) Continue to develop technology for global high-rate military communications and networking, including optical communications in space and fiber. Continue demonstration and extension of networking techniques and protocols for interworking among disparate networks including Milsatcom. Complete testing of ultra-fast optical testbed with 100 Gbps transmissions between Lincoln Laboratory and Washington, DC (application to surveillance data processing). Investigate novel application areas for optical technology such as ultra-fast data encryption and processing.

(U) Defensive Information Warfare: Development and evaluation of advanced techniques for network intrusion detection will continue. Focus will shift towards detection of insider attacks (i.e. attacks from users who have authorized access to the system). Build systems that process complementary data from an ensemble of cooperating intrusion detection systems, for improved aggregate performance. Develop systems that can determine an attacker`s intent.($ 3.404 million)

(U) Combat Support Technology:

(U) Active Hyperspectral Sensing System: Develop a full-spectral active HSI system, using select, discrete-frequency laser wavelengths throughout the visible through mid-wave IR spectral regions, broadband illumination in discreet segments of those regions, and passive long-wave IR imaging. The system will be adaptable, where both the sensing wavebands and target-recognition algorithms will be specified by the applications. For some applications, visible APD arrays will be incorporated that permit range-resolved imaging as well as the standard spatial and spectral imaging that the active HSI system affords. Effort will also be expended in developing real-time processing and visualization schemes for either direct relay to user or transmission to a control station for fusion of multiple sensing assets.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Begin to explore how to adapt B-cell-based sensor for integrated package. This technology development may feed into an integrated, miniature low-power sensor at a later date.($ 2.014 million)

(U) Advanced Electronics Technology:

(U) Investigate highly scaled CMOS/SOI digital circuits using mixed electron-beam and optical lithography at 25-nm feature sizes for ultradense circuits. Explore integration of ICs in the third dimension as a means to significantly improve functional density. Demonstrate compact and power efficient version of optically sampled A/D with multi-GHz bandwidth for radar and electronic intelligence use. Extend highly integrated CCD/CMOS imager to include noiseless jitter compensation of platform motion. Continue development of UV, visible, IR and hyperspectral imaging devices with on-focal-plane processing for `smart` multimode sensors. Transfer advanced mid-IR semiconductor laser technology to industry for dual-wavelength IRCM. Continue development of combined biochemical, micromechanical, electronic systems. Continue development of solid-state devices, materials and processing subsystems in support of DoD programs.($ 5.195 million)

(U) Congressional add($ 5.226 million)

(U) FY 2002 Plans:

(U) Target Surveillance and Recognition

Surface Surveillance:

(U) Extend integrated capability to automatic detection and identification of high value targets like Surface-to-Air Missiles. This capability will build upon the trainable search agents an use terrain features as contextual information to help the target recognition process. Focus will center on the automatic target recognition of SA-6s from overhead data and reducing the processing latencies associated with these time-critical targets.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Collect data with airborne sensor to support development of advanced operational concepts and ECCM and ATR algorithms.

(U) Analyze the requirements for a system that will use the algorithms developed to image underground facilities. Consider sensors, processing, calibration and communications requirements. Continue relevant measurement to understand phenomenology and tune and validate imaging algorithms.

(U) Sonar Target Classification

(U) Develop dynamic database concepts to permit sonar to better exploit knowledge of environment, intelligence information, and external sensor data on surface ship clutter. Extend Interactive Passive Acoustic Classifier (IPAC) methodology to sonar classification with multiple sensors, using the hill, sphere, and towed arrays of a typical submarine as an example. Continue (OMI) Operator-Machine Interface development. Explore benefit to classification of distributed sensor systems.
($ 4.017 million)

(U) Military Communications:

(U) Global Networks: Continue to develop technology for global high-rate military communications and networking, including optical communications in space and fiber. Continue demonstration and extension of networking techniques and protocols for interworking among disparate networks including Milsatcom. Demonstrate networked applications over MILSTAR II to facilitate ability to transfer C4ISR data in the tactical theater. Utilize high-speed fiber network between Lincoln Laboratory and Washington, DC to demonstrate movement of radar data from sensor to remote processing site for fusion with other radar data. Investigate novel application areas for optical technology such as ultra-fast data encryption and processing.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Defensive Information Warfare: Research, development and evaluation of systems that can determine an attacker`s intent will be carried out. Research on combined detection and reaction will be extended to mobile, wireless networks. Technology transfer of detection and reaction systems to military users will continue. Methodology for evaluation of intrusion detection and reaction systems will be transferred to other government organizations.
($ 4.489 million)

(U) Combat Support Technology:

(U) Active Hyperspectral Sensing System: Develop a compact system consisting of passive HSI/MSI with select, discrete-frequency laser wavelengths. The system will be adaptable, where both the sensing wavebands and target-recognition algorithms will be specified by the applications. For some applications, visible APD arrays will be incorporated that permit range-resolved imaging as well as the standard spatial and spectral imaging that the active system affords. Effort will also be expanded in developing real-time processing and visualization schemes for a number of operational concepts.

(U) Biological Agent Detection Systems: Field testing of the integrated BAWS/B-cell sensor will be conducted and non-living analogs to the B-cells investigated to enhance sensor operability. Network architectures of miniature warning/ID sensors will be tested in combined modeling and validation measurements. Sensor architectures will be considered that fuse biological with chemical sensors and appropriate response strategies. Applications for the cartridge-based nucleic-acid testing will be expanded to include real-time, in-the-field DNA analysis, and confirmation sensing.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) Continue the development of laser-radar technologies for applications of advanced ballistic and tactical seekers and combat identification. This includes the development of visible and near-infrared-sensitive Geiger-mode APD arrays with bonded timing circuitry for 3-D laser radars. Upgrade the 3-D imaging brassboard system to operate at the 1.5-micron eyesafe wavelength. This will allow the functional test and demonstration of the InGaAs APD arrays. Examine the issues related to integrating these systems into lightweight, low power, packages consistent with advanced seeker applications, which will provide single-photon-sensitivity and high-precision range resolution for generating detailed 3-D imagery of targets. Continue the development of multi-function laser-radar systems, which combine 3-D imaging and range-Doppler/vibration sensing for applications of BMD interceptors, combat identification and foliage penetration. These systems will use the same laser transmitter for incoherent 3-D laser radar, utilizing the APD arrays, and coherent laser radar for target-vibration sensing. This development will involve the integration of a multi-function laser radar testbed, which will enable the collection of 3-D and range-Doppler image data on a variety of BMD-seeker related targets.
($ 6.170 million)

(U) Advanced Electronics Technology:
(U) Address improvement of CMOS/SOI yield and radiation hardness. Explore limits of optical lithography using phase-shift masking at 157-nm wavelength. Complete the 3-D stacked megapixel imager with on-chip digital image processing. Demonstrate optically sampled A/D at 1-GHz bandwidth in field radar site. Continue development of UV, visible, IR and hyperspectral imaging devices with on-focal-plane processing for “smart“ multimode sensors. Demonstrate near-IR/electronically shuttered 4-megapixel CCD imager for airborne reconnaissance. Build beam-combined high-brightness IRCM demonstration package. Develop high-power laser systems using beam-combined fiber sources and/or cooled Yb:YAG. Develop optimized super-wideband compressive receiver for airborne ELINT. Continue development of combined biochemical, micromechanical, electronic systems. Continue development of solid-state devices, materials and processing subsystems in support of DoD programs.
($ 7.293 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	20.189	18.602	18.845	Continuing
Appropriated Value		20.102		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.108	-0.131	0.000	
c. Other	0.000	0.000	3.124	
Current President's Budget	20.081	19.917	21.969	Continuing

Change Summary Explanation

(U) Funding: FY 2000 increase was the result of a below threshold reprogramming. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Lincoln Laboratory **PE 0602234D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2							R-1 ITEM NOMENCLATURE Medical Technology **PE 0602787D8Z**			
COST *(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	8.829	8.600	8.971						Continuing	Continuing
Radiation Injury Assessment and Therapeutic Approach/P505	8.829	8.600	8.971						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)This program supports applied research to investigate new approaches that will lead to advancements in biomedical strategies for preventing, treating, assessing and predicting the health effects of ionizing radiation, either alone or in combination with other biological warfare (BW)/chemical warfare (CW) toxicants. The premise is that DoD must be ready to conduct tactical, humanitarian or counter terrorism missions within radiation environments. Development of protective and therapeutic strategies will enable military forces to operate, when required, in nuclear or radioactive combat environments, while minimizing both short- and long-term risks of adverse health consequences. Advancements in tools to measure radiation exposure to military personnel will be used in triage, treatment decisions and risk assessment. Accurate models to predict casualties, particularly in combined nuclear-biological-chemical NBC environments, will promote effective command decisions and force structure planning to ensure mission success.
(U)The program has four primary goals: (1) to understand the pathological consequences of radiation injury and radiological hazards in order to provide a rational basis for prophylactic and therapeutic drug development; (2) to develop novel biological markers and delivery platforms for rapid, field-based individual dose assessment; (3) to define the toxicity of depleted uranium (DU); (4) to define any interactions between radiation and BW or CW agents that cause more severe injury and the drugs used to protect against them -- with the goal of developing new models to predict casualties.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) The Armed Forces Radiobiology Research Institute (AFRRI), because of its multidisciplinary staff and facility resources, is uniquely qualified to execute the program prescribed by its mission. AFRRI`s radiation sources allow the simulation of any radiological environment that might be encountered. AFRRI is currently the sole laboratory with the combined capabilities needed to conduct this research.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	8.829	8.600	8.971						Continuing	Continuing
Radiation Injury Assessment and Therapeutic Approach/P505	8.829	8.600	8.971						Continuing	Continuing

(U) Project Number and Title: P505 Radiation Injury Assessment and Therapeutic Approach

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Demonstrated therapeutic efficacy of keratinocyte growth factor (KGF) for treating radiation-induced gastrointestinal injury.($ 0.500 million)

(U) Established a cDNA screening assay for monitoring variable gene expression, and refined other experimental processes needed for rational discovery and development of preventive strategies based on fundamental mechanisms of cellular and molecular injury and repair of blood-forming (hematopoietic) and gastrointestinal organ systems. ($ 1.000 million)

(U) Extended gene-based drug screening protocols to assess efficacy of an aminothiol-based radioprotectant being developed to mitigate the adverse genomic consequences caused by acute or chronic radiation exposures and that lead to long-term health consequences.($ 0.500 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) Identified and partially characterized radioprotective qualities of a class of nutritional supplements (isoflavones) that are non-toxic by oral administration. Demonstrated efficacy of radioprotectant compounds such as androstene steroids in reducing the frequency of neoplastic transformation and related long-term adverse health effects. ($ 1.819 million)

(U) Completed and published refinements of the Premature Chromosome Condensation (PCC) interphase-chromosome aberration bioassay used for radiation dose assessment across a broad dose range from biological samples such as blood. Further refined the PCC assay by developing a cytogenetic staining technique, making the assay amenable to automated image analysis and scoring of chromosomal aberrations. ($ 1.121 million)

(U) Further demonstrated predictable dose responses of selected molecular-based biological markers of radiation exposure that can be measured by rapid field-based polymerase chain reaction (PCR) techniques. Using an in vitro human peripheral blood model, identified messenger-RNA, DNA and protein species that yield measureable reproducible responses to ionizing radiation. Confirmed utility of a fluorogenic nuclease PCR procedure to effectively measure radiation-induced altered gene expression and DNA mutations.($ 0.357 million)

(U) Continued assessing the effects of combined radiation and B. anthracis exposures on status of protective immunity. Continued to collect and analyze data to quantify the biological interactions of radiation and non-lethal, incapacitating bacterial agents. Completed initial mortality studies on combined exposure to radiation and viral agents (e.g. VEE). Continued animal model studies to collect and analyze experimental data to improve and expand the predictive value of casualty prediction models and to provide information to improve clinical management of combined injuries. ($ 1.462 million)

(U) Completed animal model experimentation to assess treatment strategies for endemic shigellosis in irradiated animals. Continued assessment of the combined effects of radiation exposure and sleep deprivation on brain wave patterns and sleep-wake cycle alterations ($ 1.118 million).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) Continued work on the carcinogenic potential of DU and other militarily relevant heavy metals by measuring transformat ion potential and genotoxicity in in vitro cell culture systems. Completed pilot studies on immune system effects resulting from long-term DU exposure. Completed cell culture pilot study to assess tungsten toxicity. ($ 0.952 million)

(U) FY 2001 Plans:

(U) Develop simplified drug delivery systems for new drug prototypes. Commence initial design and testing of vehicles for oral and subcutaneous administration of metabolite- and nutritional-based radioprotectants (androstendiol, vitamin E, isoflavones).($ 1.430 million)

(U) Initiate use of molecular biomarker and other functional assays to assess host immune defense response to combined radiation/virus-bacteria exposures. Complete studies on the interaction of radiation and sleep deprivation on seizure incidence, brain waves and sleep-wake cycles.($ 0.689 million)

(U) Continue to identify promising new radioprotectants and therapeutics using newly established drug screening assays. Continue to refine and test preventive teatment strategies based on fundamental mechanisms of cellular and molecular injury and repair of blood-forming (hematopoietic) and gastointestinal organ systems. ($ 1.043 million)

(U) Continue to extend and refine high-throughput, gene-based drug screening protocols to assess effi cacy of newly identified radioprotectants, therapeutics, or combinations for both early- and late-arising injuries. ($ 0.796 million)

(U) Test efficacy of second-generation, slow-release radioprotectant implants under chronic irradiation exposure.($ 0.74 6 million)

(U) Continue development of a clinical cytogenetic-based bioassay system by extending improvements in sample preparation, imaging and data analysis, and by broadening the operating range of dose measurement.($ 0.844 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) Continue development of molecular biomarker systems for field use. Continue to assess dose-ranges and time-window characteristics for gene expression and protein radiation biomarkers. Continue building a library of gene expression, DNA mutation and protein biomarkers that can be rapidly measured in mutiplex arrays to give enhanced precision and accuracy of radiation dose assessment. Incorporate the use of automated data analysis systems to more efficiently evaluate promising candidate molecular biomarkers.($ 0.539 million)

(U) Complete the assessment of prophylactic efficacy of the anthrax vaccine to provide protection from infection following a combined radiation/B.anthracis exposure. Continue studies with other vaccines (e.g. for VEE) to assess effectiveness in combined radiation/infectious agent exposures. Continue to quantify the biological interactions of radiation and non-lethal, incapacitating bacterial agents. Extend mortality studies of radiation/BW agent interactions with viral threats. Continue to collect and analyze animal model data to improve and expand the predictive value of casualty prediction models.($ 1.020 million)

(U) Complete assessment of treatment strategies for endemic shigellosis in irradiated animals. Initiate evaluation of therapeutic age nts for B. anthracis and other potential BW agents for combined radiation-infectious agent exposures.($ 0.596 million)

(U) Initiate rodent life-span study of cancer risk of embedded DU and tungsten alloys. Continue studies in cultured cells of cancer risk of heavy metal exposure. Initiate full study of effects of DU exposure on the immune system. Initiate studies of DU neurotoxicity. Initiate studies of female reproductive effects of DU. ($ 0.897 million)

(U) FY 2002 Plans:

(U) Incorporate newly developed gene response and microsatellite-based genetic assays into analytical strategies for assessing radioprotectant and therapeutic drug efficacies.
($ 2.178 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) Initiate studies to determine the therapeutic benefit of combining selected pretreatments (androstenediol, vitamin E, amifostine) with post-exposure cytokine treatments (IL-11, G-CSF). Initiate studies using recombinant KGF to further characterize the efficacy of natural KGF as a pretreatment for gastrointestinal injury.($ 1.506 million)

(U) Complete sample preparation, imaging, data analysis, and operating dose range system improvements for the clinical cytogenetic-based (PCC) bioassay. Conduct tests to determine laboratory testbed performance specifications (sample throughput, accuracy, precision)($ 0.906 million)

(U) Continue to refine and optimize system characteristics and operating range performance for a molecular biomarker bioassay capable of field use. Continue to explore use of automated data analysis systems to efficiently evaluate candidate biomarkers.($ 0.757 million)

(U) Complete assessment of efficacy of VEE vaccines for combined radiation/BW agent exposures. Continue to assess efficacy of other vaccines for combined exposure. Continue to collect and analyze data to quantify biological interactions of combined exposures. Complete first phase of mortality studies with combined radiation/viral agent exposures. Continue to collect and analyze animal model data to improve and expand the predictive value of casualty prediction models.($ 1.406 million)

(U) Continue efficacy assessment of therapeutic drugs for combined radiation/infectious agent exposures. Initiate studies of combining treatments of immunomodulators with antimicrobials for combined exposures. Initiate studies to determine therapeutic effectiveness of isoflavones for combined injury. Initiate studies to determine effectiveness of vaccines to manage endemic disease of the gastrointestinal system after radiation exposure.($ 0.806 million)

(U) Continue use of molecular biomarker and other functional assays to assess host immune response to combined radiation/bacteria-virus exposures.($ 0.406 million)

(U) Complete studies of female reproductive effects of DU. Continue studies in cultured cells and rodents of cancer risk of DU and the long-term effects on the immune and nervous systems.($ 1.006 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	8.875	8.680	8.921	Continuing
Appropriated Value				Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.080	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.046	0.000	0.050	
c. Other	0.000	0.000	0.000	
President's Budget Submission	8.829	8.600	8.971	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding changes are due to the result of a below threshold reprogrammings. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** Medical Technology **PE 0602787D8Z**

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2							R-1 ITEM NOMENCLATURE High Energy Laser Research **PE 0602890D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	29.767	36.005						Continuing	Continuing
High Energy Laser/P890	0.000	29.767	36.005							

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) This program element funds High Energy Laser (HEL) applied research aimed at translating fundamental scientific knowledge into proof-of-concept solutions relevant to HEL systems. HEL weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, nearly unlimited magazine depth, low cost per kill, and reduced logistics requirements because of no need for stocks of munitions or warheads. As a result, HELs have the potential to perform a wide variety of military missions, including some that are impossible, or nearly so, for conventional weapons. These include interception of ballistic missiles in boost phase, defeat of high-speed, maneuvering anti-ship and anti-aircraft missiles, and the ultra-precision negation of targets in urban environments with no collateral damage. Research conducted under this program element develops the technology necessary to enable these and other HEL missions.

(U) This program element is part of an overall DOD initiative in HEL science and technology being conducted by the recently formed HEL Joint Technology Office (JTO). The goals of this HEL JTO funded research are to provide the technology to make HEL systems more effective and also to make them lighter, smaller, cheaper, and more easily supportable on the battlefield. In general, efforts funded under this program element are chosen for their potential to have major impact on multiple HEL systems and on multiple Service missions. As a result of this focus and of close coordination with the military departments and defense agencies, this program element complements other DOD HEL programs that are directed at more specific Service and agency needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) A broad range of technology is addressed in key areas such as chemical lasers, solid-state lasers, beam control, optics, propagation, and free-electron lasers. Research is conducted by Government laboratories, industry, and universities. The program element funds theoretical, computational, and experimental investigations. In many cases, these three types of investigations are combined under a single effort, thereby creating synergistic effects between various scientific approaches, and greatly enhancing the potential for breaking through the technology barriers that currently prevent HELs from being fielded as viable weapon systems. DOD intends to transition successful systems concepts developed under this program element into advanced technology demonstrations for particular mission needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	29.767	36.005						Continuing	Continuing
High Energy Laser/P890	0.000	29.767	36.005							

(U) Project Number and Title: P890 High Energy Laser

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Accomplishments:

(U) FY 2001 this program element funded 30 different competitively selected technical efforts, totaling $29.770 million, divided into the following areas:

- Solid State Lasers ($8.800 million)
- Beam Control ($7.530 million)
- Chemical Lasers ($6.300 million)
- Mission and Systems Analysis Studies and Program Management ($3.484 million)
- Novel and Innovative Technologies ($2.050 million)
- Lethality ($1.350 million)
- Free Electron Lasers ($0.250 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) Solid-state lasers have potential as future HEL weapon laser devices because they require only electrical energy in order to run, thereby greatly simplifying systems engineering and supportability. These devices have the potential to eliminate the need for munitions resupply on the battlefield in key mission areas such as tactical strike and air defense. Solid-state-laser technology development emphasizes combining fiber-laser modules, scaling up power in diode-pumped lasers, and testing new systems concepts. Results of these activities are key to developing solid-state lasers with weapons-class power levels. Examples of FY 2001 solid-state-laser technology-development activities include the following:

- Developing 1 kilowatt-class fiber-laser amplifiers and designing and experimentally testing methods for coherently phasing groups of fiber-laser amplifiers to increase total output power to the 10 to 100 kilowatts level
- Developing new high-power, high-reliability diode-pumped laser power supplies for fiber lasers and amplifiers, to withstand the thermal and material stresses of sustained high-power operation at powers in excess of 1 kilowatt, thereby providing a cornerstone for the development of future lighter, more lethal, more affordable, and more supportable solid-state-laser HEL weapon systems
- Developing, fabricating, and demonstrating a design for a thin-disk (as opposed to bar-like) solid-state laser at a 300 to 500 Watt power level, as a step toward the future development of 8 kilowatt disk-based laser devices, thereby potentially easing thermal-management problems on future high-power solid-state lasers
- Developing, fabricating, and demonstrating amplifiers and correcting mirrors as a means of mitigating the thermal distortions on 300 Watt average power/5 kilowatt peak power solid state lasers, thereby taking an initial step towards scaling the technology to 100 kilowatt and enabling extremely high-power solid-state lasers

(U) Beam-control technology development centers on those technologies directly applicable to surface, air, and space mission areas, as well as development of supporting technologies. Results of these activities will be transitioned to near-term HEL systems and will also serve to enhance the HEL-related technology base and industrial capability. Examples of FY 2001 beam-control technology development activities include the following:

- Developing high-power coatings and substrates, thus reducing the weight and increasing the affordability of HEL subsystems
- Conducting ground-to-space compensated laser beam propagation from a weapons-class aperture (e.g., several meters), thereby demonstrating key Ground Based Laser technologies for future space and missile-defense applications
- Developing advanced adaptive-optics component-level and subsystem-level technologies and control methodologies, thereby contributing to increasing the effective range of future HEL weapons

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

- Designing, fabricating, and testing novel concepts for adaptive optics, which promise to greatly decrease complexity and weight and increase affordability while still allowing HEL weapons to compensate for atmospheric turbulence
- Designing and fabricating new optical wavefront sensing devices that operate even in conditions of extremely high turbulence, thereby allowing beam-control subsystems to operate effectively even at low altitudes (e.g., for tactical laser systems)

(U) Chemical-laser technology efforts concentrate on developing improved predictive and design capabilities, new chemical-laser concepts, and higher performance and more supportable chemical-laser technologies. Despite the fact that chemical lasers are the most mature of the HEL laser device technologies, further technology development has the potential to greatly enhance their viability as weapon systems. Results of these activities will result in chemical lasers that are lighter and more affordable. Examples of FY 2001 chemical-laser technology-development activities include the following:

- Developing more sophisticated computational models for accurate performance prediction, thereby greatly improving design capabilities for future Hydrogen Fluoride/Deuterium Fluoride (HF/DF) and Chemical Oxygen Iodine (COIL) chemical lasers, particularly in the critical area of mixing nozzle design
- Designing, testing, and fabricating advanced mixing nozzles on HF/DF laser devices, thereby improving performance, reducing weight, and increasing effective magazine size on future space-based and ground-based HEL weapon systems
- Installing and testing a 20 kilowatt closed-cycle (sealed exhaust) COIL device as a means of assessing closed cycle COIL performance and supporting design of future closed-cycle chemical lasers, thereby offering the potential for chemical lasers that can reuse their chemical supplies, which greatly improves their supportability
- Designing, fabricating, and testing a novel means of delivering iodine chemicals to a COIL laser system in a way that eliminates the need for complex chemical tanks, thereby reducing weight and increasing reliability of future airborne chemical-laser-based HEL weapon systems, as well as simplifying iodine-associated logistics requirements

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) This program element funds two detailed studies that examine potential military missions for which HELs present unique solutions because of their inherent characteristics (i.e., speed-of-light, possibility of graduated effects, precise target selectability, nearly unlimited magazine size, reduced logistics requirements, etc.) as compared to today's conventional weapons. These studies are being used to focus the investment strategy for technology development. Additional activities of a programmatic nature that are funded by this program element include the operation of the Joint Technology Office (JTO), moving the JTO to Albuquerque, New Mexico, and funding several workshops designed to bring together experts for exchanges of ideas and gathering input for investment strategy development.

(U) Novel and innovative efforts are aimed at cross-cutting and revolutionary topics. Examples of FY 2001 novel and innovative efforts include the following:

- Developing and testing laser thermal-management concepts using a new two-phase, mist-cooling technique, which promises to greatly increase capabilities for removing waste heat from laser systems, thereby removing a technology barrier to extremely high-power lasers
- Developing the theory behind gamma-ray lasers, which could potentially offer different means of damaging targets using non-optical (i.e., gamma-ray) beams of energy generated via nuclear excitation as opposed to electronic excitation, which is the traditional method for creating laser light
- Providing support to the educational community for the specific purpose of sponsoring HEL-related science fairs, funding undergraduate and graduate programs in HELs, and including HEL topics in high-school and college curricular, thereby building the future HEL workforce

(U) Lethality technology development concentrates on developing a strong scientifically based understanding of laser kill mechanisms so that HEL systems can to optimized to produce the maximum kill probability for the minimum system size and cost. Examples of FY 2001 Lethality activities include the following:

- Developing theory and conducting experiments to improve the capability to model the interaction between extremely short laser pulses and various classes of electronic and structural materials, thereby enhancing lethality and damage assessment and countermeasures of targets when struck by HEL pulses

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

- Developing and validating a three-dimensional, time-dependent, particle-based computer code that will more accurately predict damage levels at much lower computational costs, thereby ultimately reducing the cost of HEL systems design

(U) Free electron laser (FEL) development concentrates on building the FEL technology base with the overall objective of making the FELs more lethal, smaller, and lighter. Specifically, the FY 2001 FEL activities included the following:

- Designing and testing new technology for using permanent magnets on FELs, which simplify FEL design and increase affordability because permanent magnets eliminate the need for costly electromagnets

(U) FY 2002 Plans:

(U) Pursuant to Congressional direction the DOD is developing a comprehensive, prioritized investment plan for HEL science and technology. This investment plan is being developed by the HEL JTO, in coordination with the military departments and the defense agencies. The plan, which will be completed by the end of FY 2001, will form the basis for the expanded work to be conducted under this program element in FY 2002 and beyond. Although the plan is not yet completed, the broad outlines of plan are becoming clear. Work will be conducted in solid-state lasers, free-electron lasers, chemical lasers, lethality, atmospheric propagation and compensation, lightweight deployable optics, beam control, chemical lasers, optical components, and modeling and simulation.

(U) Solid-state-laser work will focus on phasing of fiber lasers, the design and manufacture of reliable diode lasers as pump sources, and the thermal control of laser media.

(U) Free-electron-laser (FEL) work will focus on technologies to scale to high power and technologies to permit FELs to be fielded on military platforms.

(U) Chemical-laser research will include efforts to develop COIL lasers appropriate for space-based and tactical applications and efforts to improve the wavefront quality of HF/DF lasers.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) Lethality work will develop a firm scientific understanding of the relative advantages of repetitively pulsed and continuous-wave lasers for defeating different targets of interest.

(U) Atmospheric propagation and compensation will concentrate on understanding atmospheric limitations in low-altitude tactical scenarios and on developing advanced adaptive-optics technology to increase lethal range in these scenarios.

(U) A new effort will be initiated in lightweight, high-power deployable optics to reduce system weight while increasing laser intensity on target for space-based and other HEL systems.

(U) Beam-control efforts will focus on developing novel techniques, such as phased-array beam control and electronic beam steering, to reduce system size and weight and enable new system configurations (e.g., a conformal configuration on an aircraft).

(U) Advanced components—detectors for tracking systems, high-power coatings, optical substrates, wavefront sensors, deformable mirrors—will be developed to improve HEL system performance and to help protect and enhance the fragile manufacturing base in this critical area.

(U) Modeling and simulation efforts will be increased with the goal of providing a fully realistic model of end-to-end system performance, from birth of photons in the laser to their death at the target, thereby improving the design of HEL systems and reducing the need for expensive field testing.

(U) It is expected that many of the 30 projects begun in FY 2001 will continue in FY 2002, as will mission-analyze efforts. Continuation a project will be contingent on the project’s success in FY 2001 and on its relevance to the goals of the investment strategy.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**						**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000						
Appropriated Value	0.000	30.000	0.000						Continuing
Adjustments to Appropriated Value									
a. Congressionally Directed Undistributed Reduction	0.000	-0.233	0.000						
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000						
c. Other	0.000	0.000	36.005						
Total Program Element (PE) Cost	0.000	29.767	36.005						Continuing
President's Budget Submission	0.000	29.767	36.005						

Change Summary Explanation

(U) Funding: PE 06020890D8Z was established to address the imbalance in enabling science and technology and large demonstration programs for high-energy laser technology. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule:

(U) Technical:

(U) C. Other Program Funding Summary Cost

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 2	**R-1 ITEM NOMENCLATURE** High Energy Laser Research **PE 0602890D8Z**

(U) D. Acquisition Strategy:

(U) E. Schedule Profile:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Medical Advanced Technology Program **PE 0603002D8Z**			
COST *(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.986	2.025	2.086						Continuing	Continuing
Risk Assessment and Biamedical Applications/P506	1.986	2.025	2.086						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)This program supports efforts in advanced technology development to provide biomedical strategies for preventing, treating, assessing and predicting casualties from ionizing radiation, either alone or in combination with biological warfare (BW)/chemical warfare (CW) agents. It is directed at the need for the Department of Defense (DoD) to be prepared to execute military missions within radiation environments, to manage radiation crises associated with terrorist activities, and for consequence management in the event of nuclear weapons detonation. The DoD is ethically committed to protection of Service members from the adverse health effects of ionizing radiation to the fullest extent consistent with operational requirements. The program incorporates findings from basic and applied research into highly integrated and focused advanced technology development studies to produce: (1) protective and therapeutic strategies, (2) tools to measure radiation and depleted uranium (DU) exposure to military personnel, and (3) accurate models to predict casualties, particularly in combined nuclear-biological-chemical (NBC) environments. The Armed Forces Radiobiology Research Institute (AFRRI), because of its multidisciplinary staff and exceptional laboratory and radiation facilities, is uniquely qualified to executes the program prescribed by its mission. Because national laboratories operated by the Department of Energy no longer support advanced research relevant to military medical radiobiology, AFRRI is currently the sole laboratory in existence with the combined capabilities needed to conduct this research.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Medical Advanced Technology Program **PE 0603002D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.986	2.025	2.086						Continuing	Continuing
Risk Assessment and Biamedical Applications/P506	1.986	2.025	2.086						Continuing	Continuing

(U) Project Number and Title: P506 Risk Assessment and Biamedical Applications

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Demonstrated efficacy of combined cytokine (IL-11 and G-CSF) treatment for chronic radiation exposure of the hematopoietic system.($ 0.165 million)

(U) Distributed pre-beta version of the biodosimetry assessment tool (BAT) software program to selected laboratories and clinical colleagues for initial review and comments.($ 0.100 million)

(U) Demonstrated safety of 5-androstenediol in preclinical trial using the canine animal model. Initiated pharmacokinetic studies of 5-androstenediol in canine animal model.($ 0.300 million)

(U) Determined correlation between pharmacokinetic response and radioprotection of a second-generation aminothiol radioprotectant using a slow-release implant delivery system and measuring tissue injury, survival, and animal performance metrics. Completed study on toxicity (nausea) reduction to aminothiol prophylaxis by supplemental treatment with anti-emetics.($ 0.147 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	R-1 ITEM NOMENCLATURE Medical Advanced Technology Program **PE 0603002D8Z**

(U) Continued in vivo studies validating cytogenetic-based (interphase-cell chromosome-aberration) biodosimetry system over a broad dose range and partial-body exposure situation. Tested improved cytological analysis platforms using simple and easy-to-perform sample preparation protocols. ($ 0.800 million)

(U) Demonstrated elevation of gene-expression at the messenger-RNA and protein levels using an in vivo irradiated mouse model system. Completed initial-phase optimization of PCR-based assays for measuring gene expression of a single target molecular biomarker using an existing field deployable analytical platform. ($ 0.174 million)

(U) Coordinated assembly of experimental data from B. anthracis/radiation animal studies and delivered to the Defense Threat Reduction Agency`s Human Response Program for incorporation into the Consequences Assessment Tool Set (CATS) program to model casualty predictions. ($ 0.100 million)

(U) Completed development of a method to measure uranium in urine of military personnel; generated protocol to application centers for assessment as a fieldable methodology. Completed development of protocols for a rapid, simple method to identify DU fragments and initiated patent application. ($ 0.200 million)

(U) FY 2001 Plans:

(U) Complete preclinical safety assessment of 5-androstenediol using a canine animal model. Initiate safety assessment of an injectable vitamin E-based radioprotectant in the canine model. ($ 0.509 million)

(U) Initiate preclinical safety and efficacy studies of the therapeutic cytokine combination, IL-11 plus G-CS F, in the canine animal model. ($ 0.082 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	R-1 ITEM NOMENCLATURE Medical Advanced Technology Program **PE 0603002D8Z**

(U) Complete 1st phase in vivo test and evaluation of the cytogenetic-based biodosimetry system encompassing dose-range and partial body exposure studies in radiation therapy patients. Collect exposure data to validate performance charactristics involving prior radiation exposures.($ 0.888 million)

(U) Continue optimization studies using a single analytical platform for a field-based biodosimetry system including the development of sample preparation protocols and the development of protocols to allow measurement of multiple radiation-responsive gene-expression biomarkers. ($ 0.099 million)

(U) Provide initial assessment of aberrations in B. anthracis vaccine efficacy as a consequence of exposure to ionizing radiation. Initiate efforts to incorporate performance-degrading consequences from combined radiation/BW agent exposures into the CATS casualty prediction models. ($ 0.248 million)

(U) Initiate in vivo cancer studies with embedded DU. Complete patent application for rapid, simple analysis method to identify DU fragments. Generate protocol available to application centers for assessment as a potential fieldable methodology. Use DU research results to continue contributions to assess fragment removal policies. ($ 0.199 million)

(U) FY 2002 Plans:

(U) Complete preclinical safety and efficacy study of 5-androstenediol in the canine. Initiate efficacy studies of the injectable vitamin E-based radioprotectant in the canine. Initiate safety assessment of a slow-release aminothiol-based radioprotectant in the canine.($ 0.502 million)

(U) Continue safety and efficacy studies of the combined cytokine treatment, IL-11 and G-CSF, in the canine.($ 0.102 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Medical Advanced Technology Program **PE 0603002D8Z**

(U) Continue test and evaluation of the cytogenetic-based biodosimetry system using samples from radiotherapy patients and by defining performance specifications for low-dose rate gamma and fission neutron radiation using the previously developed automated imaging platform.($ 0.702 million)

(U) Continue validation of a field-based biodosimetry system using multiple biomarkers for dose assessment.($ 0.102 million)

(U) Provide completed data set demonstrating the effect on mortality and morbidity of combied radiation/B. anthracis exposure as a function of vaccine efficacy to the CATS model. Provide data demonstrating the effect on mortality and morbidity of combined exposure to radiation and VEE as a function of vaccine efficacy to the CATS model.($ 0.376 million)

(U)Continue in vivo cancer studies for embedded DU.($ 0.302 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Medical Advanced Technology Program **PE 0603002D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	2.007	2.043	2.075	Continuing
Appropriated Value	0.000	2.043	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.018	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.011	
c. Other	-0.021	0.000	0.000	
President's Budget Submission	1.986	2.025	2.086	Continuing

Change Summary Explanation

(U) **Funding**: FY 2000 adjustments were the result of a below threshold reprogramming. FY 2001 reductions reflect Section 8086 adjustments.

(U) **Schedule**: N/A

(U) **Technical**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Medical Advanced Technology Program **PE 0603002D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Explosives Demilitarization Technology **PE 0603104D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	24.017	29.886	8.815						Continuing	Continuing
JDTP/P486	24.017	29.886	8.815						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) The Explosive Demilitarization Technology Program is a cooperative interservice, interagency effort focused as the sole Department of Defense (DoD) program dedicated to the development of safe, efficient and environmentally acceptable processes for the resource recovery and recycling (R3) or disposition of strategic, tactical, and conventional munitions including explosives, and rocket motors. Efforts in this program emphasize environmentally compliant technologies to enhance existing methods for munitions R3 and treatment and seeks alternatives over that of open burning/open detonation (OB/OD). There are currently over 500,000 tons of these materials requiring disposition with a forecast of over 1,450,000 tons to flow through the stockpile by 2005. This is funded under Advanced Technology Development based upon its supports to the development and exploration of new munitions concepts and technology preceding system engineering development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

(U) The effort employs the highly developed technology base in the DoD Service Laboratories and Technical Centers, the Department of Energy (DoE) National Laboratories, industry, and academia. The program is integrated through the leadership of the Joint Ordnance Commanders Demilitarization Subgroup and seeks to leverage support from the Deapartment`s Environmental Security Technology Certification Program (ESTCP), the Strategic Environmental Research and Development Program (SERDP), the Joint DoD/DOE Munitions Program, and complementary Service science and technology programs. Each project is required to include a federal laboratory sponsor and is provided peer review by the Joint Working Group. The Demilitarization Users Group is utilized to assess and review ongoing and emergent demilitarization requirements for use in planning future investments for this program. The program supports an annual Global Demilitarization Symposium, which focuses on technology transfer opportunities and the technical review and data evaluation from ongoing projects and advanced demonstrations. This program was established pursuant to Section 226 of the National Defense Authorization Act Fiscal Year 1996 (Public Law 104-106) and Section 227 of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201). The program provides an annual report to the Congress, which provides a detailed plan update on technology investments, accomplishments, and future planned investment areas. Recent annual reports; FY 1998-Department of Defense Joint Demilitarization Technology Program (March 1999) and the FY 1999-Department of Defense Joint Demilitarization Technology Program (February 2000).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	24.017	29.886	8.815						Continuing	Continuing
JDTP/P486	24.017	29.886	8.815						Continuing	Continuing

(U) Project Number and Title: P486 JDTP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Completed engineering design and initiated fabrication for a hot gas decontamination system to address explosive residue contamination on munition components generated during the demilitarization process. Initiated procurement, fabrication of prototype equipment at Hawthorne Army Depot.($ 3.000 million)

U) The Nevada Test Site Demonstration Program continued in FY 2000. Tunnel Detonation data reduction and analyses were conducted to benchmark the events. Noise mitigation techniques were performed. Completed installation of the contained burn chamber and demonstrated destruction of 70 shillelagh rocket motors. Began system modifications to accommodate a variety of tactical systems. Initiated transition of improved molten salt oxidation system. Designed advanced molten salt reactor, feed preparation system, pollution control system and salt removal systems. Joint Program integration continued.($ 6.828 million)

(U) Design of a hydrothermal oxidation demilitarization waste treatment system with the capability to treat 6,000 gallons per week at 1.2 gallons per minute was completed. Fabrication and assemblage of equipment and pads, erection of components and initial prove out was initiated.($ 3.000 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

(U) Improvements and enhancements to the liquid ammonia reduction process were initiated . Engineering design and procurement of the improved flash evaporator, filter system, glycol heater system, replacement of ammonia compressor and modular construction of the chemical processing tower were successfully demonstrated.($ 2.114 million)

(U) Initiated advanced cutting development using femto second laser cutting technology. Explored beam spatial profile, power, pulse repetitive rate and vacuum level to determine the optimal cutting parameters for HE material. Abrasive waterjet technology for cutting 40mm HE projectiles was demonstrated. Optimization and integration into flexible work cell and induction heating to melt out TNT from waterjet sectioned projectiles was initiated. Development of automated flexible workcell continued. Explosion proof robotic end of arm tooling and workcell hardware were successfully completed. Force and vision control capability development initiated.($ 3.912 million)

(U) Near Infra-red portable propellant analyzer was demonstrated in the field and verification of data generated was accomplished. The thin layer chromatography propellant analyzer kit has been refined by improving computer software for analyzing propellant samples and utilizing environmentally benign chemicals to process samples. Completed design engineering and fabrication of transportable modular unit for a propellant conversion to fertilizer system capable of converting 2,000 to 4,000 pounds of propellant per batch. Completed design and initiated procurement of a 500 pound per day prototype system for recovery of RDX form Comp A-3. Demonstrated pilot scale capability to recover HMX from Class 1.1 propellants.($ 2.824 million)

(U) Successfully completed laboratory and bench scale process to convert explosive D conversion to picric acid through catalytic hydrotreating and nitric acid reduction. Design and fabrication of a 500 pound per day conversion process system completed. ($ 2.339 million)

(U) FY 2001 Plans:

(U)Congressional adds:
Advanced cutting technology $0.8 million

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

Contained Detonation $7.0 million
Hydrothermal Oxidation $3.0 million
Thin Layered Chromotography $4.0 million
Hot Gas Decontamination $1.5 million
Explosives Demilitarization Technology $1.5 million
Other $3.4 million($ 21.200 million)

(U) The Nevada Test Site Demonstration Program will continue to focus on demonstrating improved field detonation operations. Detonation events will be designed and executed based on data gathered from previous experiments. Facility fragment and noise containment designs will be tested and measured against EPA standards. Testing and modification for a variety of tactical missiles for the contained burn chamber will continue. Advanced molten salt oxidation technology will be installed with demonstration/validation initiated. ($ 5.486 million)

(U) Advanced removal/conversion efforts will continue. Explosive D conversion to picric acid will be demonstrated in the 500 pound per day pilot facility. Demonstration of a 2,000 to 4,000 pound per batch transportable modular unit to convert propellant to fertilizer will be completed. Demonstration of a 500 pound per day prototype system for recovery of RDX from Comp A-3 will be performed.($ 1.100 million)

(U) Improved liquid ammonia reduction pilot process will be demonstrated on tactical missiles.($ 0.350 million)

(U) Advanced cutting technology will continue with the femto second laser pursued and optimized for munition applications. Flexible workcell with waterjet cutting capability for 40mm cartridges will be completed. Force and vision control capability will be demonstrated. Work will be initiated to adapt the workcell to process other munitions such as the 155mm M483 ICM.($ 1.100 million)

(U) Analytical tools for explosive and propellant evaluation will continue to be optimized for recovered items. ($ 0.650 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

(U) FY 2002 Plans:

(U) The Nevada Test Site Demonstration Program will continue to focus on demonstrating improved field detonation operations. Detonation events will be designed and implemented based on data gathered from previous experiments. Noise and emission mitigation techniques will be investigated. Stand off monitoring techniques and technologies will be initiated. Testing and modification for a variety of tactical missiles for the contained burn chamber will continue. Advanced molten salt oxidation technology will be demonstrated/validated. Joint program integration will continue.($ 5.065 million)

(U) Advanced removal/conversion efforts will continue. Explosive D conversion to picric acid and RDX recovery system will be transitioned to operational activities. Process development will begin on inductively coupled plasma conversion process.($ 1.000 million)

(U) Complete demonstration and transition of improved liquid ammonia reduction pilot process to operational activities.($ 0.750 million)

(U)) Advanced cutting technology will be integrated into the flexible work cell. Work will continue to adapt the workcell to process other munitions.($ 0.750 million)

(U) Continue analytical tools development for optimizing recovered items and demilitarization process for munitions. These tools will focus on explosive and propellant recovery.($ 0.650 million)

(U) Initiate efforts to enhance and optimize cryofracture technology for munitions.($ 0.500 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	23.635	8.964	9.265	Continuing
Appropriated Value	0.000	30.164	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.278	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	0.382	0.000	-0.450	
Current President's Budget	24.017	29.886	8.815	Continuing

Change Summary Explanation

(U) Funding: FY 2000 reductions were identified on the FY 00 OMNIBUS reprogramming. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Explosives Demilitarization Technology **PE 0603104D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									JUNE 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	8.543	8.799						Continuing	Continuing
Explosive Ordnance Disposal/Low Intensity Conflict/P206	0.000	7.317	7.486						Continuing	Continuing
Special Operations/Low Intensity Conflict (SO/LIC)/P205	0.000	1.226	1.313						Continuing	Continuing
Alternatives to Antipersonnel Landmines/P121	0.000	0.000	0.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) P121, Alternatives to Anti-personnel Landmines (APL). This project develops, tests, and evaluates area denial systems to replace anti-personnel landmines (APL). APL alternatives include surveillance systems, command and control systems, and overwatch fires which were evaluated and developed in parallel. Nonlethal technologies will also be evaluated for applicability. During the first phase, various concepts will be defined in detail and examined with emphasis placed on leveraging existing programs. A process to select viable alternatives for further development was conducted using modeling and simulation along with advanced warfighting experiments. The selected approaches will enter prototype development. Further selection of viable concepts will enter the engineering and manufacturing development phase.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) P205, Special Operations/Low-Intensity Conflict (SO/LIC) Analytical Support. The SO/LIC Analytical Support project provides specialized research and analytical support for the Assistant Secretary of Defense for Special Operations and Low- Intensity Conflict (ASD (SO/LIC). Projects address a broad spectrum of technical, acquisition, and policy issues relating to special operations, counter- and anti-terrorism, peacekeeping, psychological operations, counterinsurgency, unconventional warfare, and contingency operations. The project supports and is integrated into overall DoD efforts to develop options for dealing effectively with a wide range of military responsibilities in military operations other that war. This project provides a vehicle to initiate analysis required to support acquisition documentation and conceptual policy issues regarding roles and missions of SOF in the changing world environment. Analysis may also be used to improve OASD(SO/LIC)`s congressionally mandated oversight function of special operations and low-intensity conflict.

(U) P206, Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC). The EOD/LIC project is a rapid prototyping effort to provide technology and equipment to military operators who are confronted with explosive threats. Tasks focus on detection, countermeasures, and neutralization of explosive threats. Requirements submitted by the Joint Service EOD community and other LIC-oriented military users are prioritized by the OSD EOD/LIC Coordination Group.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	8.543	8.799						Continuing	Continuing
Explosive Ordnance Disposal/Low Intensity Conflict/P206	0.000	7.317	7.486						Continuing	Continuing

(U) Project Number and Title: P206 Explosive Ordnance Disposal/Low Intensity Conflict

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Plans:

(U) Complete development of a limpet mine imaging SONAR (LIMIS). LIMIS is a diver-held or submersible mounted sonar that provides almost photographic quality images in turbid water. It was developed to detect and identify limpet mines on hulls of ships. It is also used to identify and inspect bottom mines and other objects where optical systems fail.

(U) Complete development of an in-mask liquid crystal diver display system that provides the diver with depth, dive time and tank pressure via wireless RF link.

(U) Complete development and safety certification of an improved underwater demolition charge to counter threats in the very shallow water mine countermeasure (VSW/MCM) area of responsibility. The system will allow a diver to carry multiple charges and will interface with existing and emerging firing devices.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) Complete development and safety certification of a limpet mine neutralization tool. System will be small and easy to use. The system will interface with existing and emerging firing devices.

(U) Complete development of an acoustic-based underwater navigation system for divers that will ensure thorough hull searches are performed. The system will be man-portable, accurate to within 1-meter and provide real-time location of divers and contacts.

(U) Complete development of a C3I system that will reduce the amount of time an operator has to spend down range by allowing "seamless" audio, video and data transfer between the two sites via digital RF link. The system will be HERO safe, modular, man-portable and wireless.

(U) Complete development of a SOF/EOD Tactical Decision Aid (TDA). The TDA is a software based information tool that supports SOF/EOD field analysis. The EOD TDA will include: time fuse burn calculations, standard mathematical calculations and unit conversions, blast/frag distance and blast overpressure effects calculations, nuclear weapon stay times, downwind hazard prediction software, safe swimmer distance calculations and a time zone conversion tool. The SOF TDA will incorporate an automated target analysis tool.

(U) Complete the development of a laser ordnance neutralization system and demonstrate the use of high-powered diode-pumped lasers to neutralize unexploded ordnance (UXO). This project focuses on neutralizing small UXO on active target ranges. Specific areas being studied include cost benefits, neutralization efficiency, and environmental impact.

(U) Complete development of a maritime ballistic armor system for the Coastal Assault Craft (CAC) and provide data for input into the Special Operations Craft – Riverine (SOC-R) Operational Requirement. Protection is to provide coverage to the passengers, crew and critical craft systems assuming an overall defensive posture.

(U) Complete improvements to the unmanned surface vehicle developed under the EOD/LIC program, The focus areas of this effort are to improve vehicle reliability and maintainability, improve data links, ruggedize and reduce in size the command and control system and improve situational awareness capabilities. ($ 0.450 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) Continue development of an EOD underwater remotely operated vehicle (ROV) system. The task focuses on the use of COTS systems that have the potential to provide Navy EOD teams with a small (i.e. 2-person portable or smaller) ROV/sensor package for employment from rigid hull inflatable boats (RHIB) or similar small craft of opportunity to reacquire, investigate and identify previously reported mine-like contacts in the water column and on the seabed.

(U) Continue development of an RF X-ray system. This effort will modify the existing RTR-4 X-ray system to increase the effective image transfer range from 300 feet to over one (1) mile via the use of a digital RF link. The system will be configured such that operation can be controlled from the command post of the EOD incident site.

(U) Continue task to identify and integrate COTS/GOTS chemical/biological/nuclear (CBN) sensors onto EOD robotic platforms. The system(s) will be able to identify and quantify CBN threats accordingly.

(U) Continue development of a chemical leak seal system. This system will prevent chemical or biological agent leakage from damaged munitions. The system will have minimal set up time, will seal a variety of ordnance types, holes and hole sizes, will utilize COTS materials to the greatest extent possible and will be packaged in a kit to allow for rapid field deployment and ease of use. The system will be an alternative to Plaster-of-Paris.

(U) Continue development of a miniature diver display system that will provide full color, high-resolution imagery to the diver. The system will employ miniature, lightweight optics that will provide a clear, fixed focus, magnified image. The diver will control the image brightness so that the display can be optimized for daytime, or nighttime use. Custom-built interface electronics will allow the display to present video, or other data (such as from SONAR or computers).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) Continue development of an incident site reconnaissance (ISR) system. This project will provide EOD technicians with a field capability to gather digital imagery, GPS coordinates and laser range finder information with the ability to relay that data to a rear area commander. This system will automate the reconnaissance of an area of interest and provide a communications link in which to relay that information. The data will be transmitted over an RF link to a computer containing an appropriate software package to allow for the overlay of data onto a digital map. COTS technology will be used to the greatest extent possible.

(U) Continue development of a hydro-abrasive water cutting system that will allow EOD technicians to cut open UXO remotely. Initial user training has been accomplished. Testing of manufacturer's claims and field evaluation being performed.

(U) Continue development of a low-cost and highly portable mini-reconnaissance vehicle based on COTS equipment. Potential applications of the vehicle include use as a remote observation post, linking on-site operators to a remote command center, and acting as a mobile platform for auxiliary sensors such as chemical and biological agent alarms with the addition of a disruptor capability.

(U) Continue development of the Advanced EOD Publication Set.
($ 2.200 million)

(U) Start development of a single sided x-ray system.

(U) Evaluate the Telepresent-Rapid-Aiming-Platform (TRAP) for Standoff Munitions Disruption (SMUD) applications and obtain MARSYSCOM and WSESRB certification.

(U) Start a task to evaluate the CO2 Laser Ordnance Neut ralization System and the All-purpose Remote Transport System (ARTS) integrated platform for range clearance applications.

(U) Start development of a more effective and efficient means to initiate the M-14 Thermite grenade.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) Start development of an X-ray film system that provides a larger image. It is anticipated that the system shall incorporate a grid arrangement of 8 x 10 film.

(U) Start development of an X-ray interpretation system. Effort will identify/develop IED component recognition algorithms. The system will be able to interpret digital X-ray images and automatically identify contents and components.

(U) Start development of a dispersal/fragmentation containment system. The effort will focus on COTS items or materials.

(U) Start a task to evaluate thermal imagers for EOD use. Determine if COTS/GOTS thermal imaging technology can effectively be used to locate concealed ordnance or IEDs.

(U) Start development of a coxswain's steering assistant. Effort will evaluate COTS systems that provide compass, GPS and navigational chart graphics on one screen. The system will be portable, weather/environment resistant, low light/daylight visible and laptop sized as a guide.

(U) Start development of advanced armor solutions to EOD/SOF threats. Effort will maintain IPT formed in support of maritime ballistic armor task and continue to develop/evaluate advanced armoring techniques and materials.

(U) Start development of an unmanned reconnaissance/obscurant craft. Focus will be on forwarding technology developed under the unmanned surface vehicle task and optimizing size for deployment from a SOC riverine craft.

(U) Start development of an obscurant capability for the Special Operations Craft – Riverine and the unmanned reconnaissance/obscurant craft.

(U) Start development of an incendiary device for SOF operators. Device will have the capability to adhere to vertical and overhead surfaces as well as mines placed on the ground.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) Start development of an integrated diver display mask for the LAR V diving system. System will forward technology previously developed under EOD/LIC and provide the SOF diver/swimmer with an in-mask LCD display of navigation and dive profile information.

(U) Start development of a maritime equipment transfer platform. The effort will provide a small, robust amphibious capability to transfer equipment from support craft to inshore elements via an ATV type platform. The focus will be on COTS/MCOTS systems.

(U) Perform acoustic and magnetic signature evaluations and validate performance characteristics of the Metal Matrix cast composite engine and the Vehicle Development, Inc. reflex water jet.

(U) Start development of an improved special operations craft. Effort will focus on COTS/MCOTS solutions.

(U) Start development of an advanced propulsion system for the unmanned reconnaissance/obscurant craft. Effort will focus on COTS non-gasoline engines and will be demonstrated in the unmanned surface vehicle previously developed under EOD/LIC.

(U) Start development of a robotic mine sensor system that will maneuver and mark a path through a minefield. System will improve mission success-soldier survivability when conducting SR/DA missions in mined areas.
($ 4.667 million)

(U) FY 2002 Plans:

(U)Complete evaluation of thermal imagers for EOD use. Determine if COTS/GOTS thermal imaging technology can effectively be used to locate concealed ordnance or IEDs.

(U)Complete development of a dispersal/fragmentation containment system. The effort will focus on COTS items or materials.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U)Complete development of a coxswain's steering assistant. Effort will evaluate COTS systems that provide compass, GPS and navigational chart graphics on one screen. The system will be portable, weather/environment resistant, low light/daylight visible and laptop sized as a guide.

(U)Complete development of an incendiary device for SOF operators. Device will have the capability to adhere to vertical and overhead surfaces as well as mines placed on the ground.

(U)Complete acoustic and magnetic signature evaluations and performance validation of the Metal Matrix cast composite engine and the Vehicle Development, Inc. reflex water jet.

(U)Complete development of an improved special operations craft. Effort will focus on COTS/MCOTS solutions.

(U)Complete development of an advanced propulsion system for the unmanned reconnaissance/obscurant craft. Effort will focus on COTS non-gasoline engines and will be demonstrated in the unmanned surface vehicle previously developed under EOD/LIC.
($ 0.750 million)

(U)Continue development of a single sided x-ray.

(U)Continue development of x-ray interpreter system. Effort will identify/develop IED component recognition algorithms. The system will be able to interpret digital X-ray images and automatically identify contents and components.

(U)Continue development of advanced armor solutions to EOD/SOF threats. Effort will maintain IPT formed in support of maritime ballistic armor task and continue to develop/evaluate advanced armoring techniques and materials.

(U)Continue development of an unmanned reconnaissance/obscurant craft. Focus will be on forwarding technology developed under the unmanned surface vehicle task and optimizing size for deployment from a SOC riverine craft.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U)Continue development of an obscurant capability for the Special Operations Craft – Riverine and the unmanned reconnaissance/obscurant craft.

(U)Continue development of an integrated diver display mask for the LAR V diving system. System will forward technology previously developed under EOD/LIC and provide the SOF diver/swimmer with an in-mask LCD display of navigation and dive profile information.

(U)Continue development of a maritime equipment transfer platform. The effort will provide a small, robust amphibious capability to transfer equipment from support craft to inshore elements via an ATV type platform. The focus will be on COTS/MCOTS systems.

(U)Continue development of a robotic mine sensor robot that will maneuver and mark a path through a minefield. System will improve mission success-soldier survivability when conducting SR/DA missions in mined areas. ($ 2.200 million)

NEW STARTS - EOD/LIC candidate submission input will be received January 2001. Candidate selection will be conducted in spring 2001 for FY 2002 new start tasks.($ 4.536 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	8.543	8.799						Continuing	Continuing
Special Operations/Low Intensity Conflict (SO/LIC)/P205	0.000	1.226	1.313						Continuing	Continuing

(U) Project Number and Title: P205 Special Operations/Low Intensity Conflict (SO/LIC)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Plans:

(U)The FY 2001 program will be finalized in August 2000, ensuring that study projects are timely and responsive to the requirements of DoD policy makers.($ 1.226 million)

(U) FY 2002 Plans:

(U)The FY 2002 program will be finalized in August 2001, ensuring that study projects are timely and responsive to the requirements of DoD
policy makers.($ 1.313 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	0.000	8.622	8.750	Continuing
Appropriated Value				Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.079	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	0.000	0.000	0.049	
Current President's Budget	0.000	8.543	8.799	Continuing

Change Summary Explanation: Funding changes are due to congressional undistributed reductions.

(U) Funding: Funding changes are due to congressional undistributed reductions and inflation adjustments. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** SO/LIC Advanced Development **PE 0603121D8Z**

(U) **Technical**: Funding changes are due to congressional undistributed reductions and inflation adjustments.

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Combating Terrorism Technology Support **PE 0603122D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	55.324	48.852	42.243						Continuing	Continuing
Combating Terrorism Technology Support (CTTS)/P484	46.596	48.852	42.243						Continuing	Continuing
Special Operations/Low Intensity Conflict (SO/LIC)/P205	1.308	0.000	0.000						Continuing	Continuing
Explosive Ordnance Disposal/Low Intensity Conflict/P206	7.420	0.000	0.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) In FY 2001 PE 0603122D8Z was realigned. It has been renamed Combating Terrorism Technology Support and consists of only P484. P205 and P206 moved to PE 0603121D8Z, SO/LIC Advanced Development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) P484, Combating Terrorism Technology Support (CTTS). Thi s program develops technology and prototype equipment that address needs and requirements with direct operational application in the national effort to combat terrorism. The program integrates Defense advanced development efforts with government-wide and international efforts to combat terrorism. Projects support antiterrorism, counterterrorism, intelligence and terrorism consequence management activities to: conduct tactical operations; protect military forces, civilian personnel, installations, infrastructure elements and the general populace from terrorist attack; detect, neutralize, and mitigate the effects of conventional and unconventional devices; conduct surveillance and tracking of terrorists; conduct threat and incident assessments; and process and disseminate information. The Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict oversees and is responsible for execution of the CTTS program, which addresses combating terrorism technology requirements identified by the interagency Technical Support Working Group (TSWG). The TSWG is a multi-agency R&D working group under the aegis of the Interagency Working Group on Counterterrorism. As such, the CTTS program supports, and is integrated into, the national interagency response to terrorism.

(U) All projects are distributed among eight mission categories: Chemical, Biological, Radiological, and Nuclear Countermeasures; Explosives Detection and Defeat; Infrastructure Protection; Investigative Support and Forensics; Personnel Protection; Physical Security; Surveillance, Collection, and Operations Support; and Tactical Operations Support. This program is a non-system advanced technology development effort used to demonstrate the utility or cost reduction potential of technology when applied to different types of defense equipment or techniques. It includes technology development and proof-of-principle demonstrations in field applications for new and improved systems. Coordination and planning efforts with the participating agencies facilitate technology transition from development to operational use. The demonstrations strive to evaluate and assess technologies in a realistic operating environment.

(U) P206, Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC). The EOD/LIC project is a rapid prototyping effort to provide technology and equipment to military operators who are confronted with explosive threats. Tasks focus on detection, countermeasures, and neutralization of explosive threats. Requirements submitted by the Joint Service EOD community and other LIC-oriented military users are prioritized by the OSD EOD/LIC Coordination Group.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) P205, Special Operations/Low-Intensity Conflict (SO/LIC) Analytical Support. The SO/LIC Analytical Support project provides specialized research and analytical support for the Assistant Secretary of Defense for Special Operations and Low- Intensity Conflict [ASD (SO/LIC)]. Projects address a broad spectrum of technical, acquisition, and policy issues relating to special operations, counter- and anti-terrorism, peacekeeping, psychological operations, counterinsurgency, unconventional warfare, and contingency operations. The project supports and is integrated into overall DoD efforts to develop options for dealing effectively with a wide range of military responsibilities in military operations other that war. This project provides a vehicle to initiate analysis required to support acquisition documentation and conceptual policy issues regarding roles and missions of SOF in the changing world environment. Analysis may also be used to improve OASD(SO/LIC)`s congressionally mandated oversight function of special operations and low-intensity conflict.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	55.324	48.852	42.243						Continuing	Continuing
Combating Terrorism Technology Support (CTTS)/P484	46.596	48.852	42.243						Continuing	Continuing

(U) Project Number and Title: P484 Combating Terrorism Technology Support (CTTS)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Completed development of a disposable chemical and biological protective clothing system; protocols for the rapid detection of biological agents and toxins in food; testing of chemical filters for building ventilation protection; and a biological agent characteristics databases for human and agricultural bioterrorism pathogens. ($ 4.309 million)

(U) EXPLOSIVES DETECTION & DEFEAT. Completed development of a low-cost remote firing device for initiation of explosive render safe tools to defeat improvised explosive devices (IEDs); a prototype single-sided neutron interrogation unit for the diagnosing of explosives associated with IEDs; an x-ray database for identification of IED components; an explosive containment system for security forces; a prototype standoff detection system for nitrogen based explosives; a prototype wind-up power generator; an x-ray backscatter technology roadmap; sympathetic detonation characterization of nitrogen based explosives; technology transition of the civilian large vehicle bomb countermeasures system; and fabrication and initial evaluation of a prototype dilute-explosive-tile disruption system for large vehicle bombs (LVBs). ($ 6.458 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) INFRASTRUCTURE PROTECTION. Completed development of an automated infrastructure analysis tool for electric power grids and fabrication of the test bed and initial measurements for the unconventional weapon characterization and effects database. ($ 1.556 million)

(U) INVESTIGATIVE SUPPORT AND FORENSICS. Completed development of an enhanced vehicle bomb computer assisted diagnostic tool; evidence source determination; questioned document analysis validation; fingerprint recovery on documents and evidence from chemical incidents; post-explosion retrieval of military explosive residue; and cockpit voice recorder analysis. ($ 3.518 million)

(U) PERSONNEL PROTECTION. Completed construction and initial evaluation of the next generation fully armored limousine; lightweight level IIIA personnel body armor; and a high fidelity model to evaluate explosive effects on vehicles and occupants. ($ 3.618 million)

(U) PHYSICAL SECURITY. Completed Personal Injury Study of the Khobar Towers bombing and identified techniques that will reduce personnel injuries from blast effects; identified, tested and began initial installation of retrofits for specific facility upgrades to support the U.S. European Command (EUCOM) and the Department of State; developed ultra-wide band radar, short-range intrusion detection sensor, standardized bomb threat evaluation cards, a vehicle inspection checklist; and a mobile truck x-ray vehicle. ($ 15.658 million)

(U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Completed requirements review for database name search and recognition. ($5.279 million)

(U) TACTICAL OPERATIONS SUPPORT. Completed development of an advanced chemical agent detector; an advanced nuclear material identification system; and a prototype miniature laser range finder. ($ 2.650 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) PROGRAM MANAGEMENT. Drafted and implemented a memorandum of agreement to establish and staff the Combating Terrorism Technology Support Office (CTTSO) including transition of management to a central office in Crystal City, Virginia. Aligned existing staff to provide program management oversight and technical support for all CTTS R&D projects. Includes management of an additional $17.9 million in funds from other agencies; and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Augmented the new CTTS office with contract and financial management personnel. Directed the program/project planning and execution for all projects including the daily management and reporting on 175 separate contracts and funding. Developed and implemented an automated approach to the Broad Agency Announcement (BAA) solicitation process, including the establishment of collaborative source evaluation and selection tools. Initiated the planning and development of process efficiency and re-engineering analysis encompassing a complete review of CTTS mission area management and reporting responsibilities internal to the organization and in support of external reporting requirements.
($ 3.550 million)

(U) FY 2001 Plans:

(U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Complete development of immobilized enzymes to enhance the performance of nerve agent detectors; training aids for canine nerve agent detection; protocols for assessing building vulnerabilities to a chemical/biological attack; enhancements to the human and agricultural bioterrorism pathogens database; testing of commercially available escape masks against a standardized set of live agent protocols; development of concept for upgrading existing DoD M256 chemical agent detector system; model validation studies for Chemical and Biological Planning Tool; training aides for canine detection; training materials to assist federal agencies in identifying suspect chemical or biological terrorist activities; and advanced biological protective clothing and respirator ensemble. Continue development of advanced aerogel sampling system for biological and chemical agents; biocontaminant detection and identification strategies and protocols; layered bed mask filters providing protection against selected toxic industrial chemicals and chemical warfare agents. Start development of advanced low-profile escape mask with wide chemical range; advanced building collective protection filtration materials; microbial risk assessment of agents of biological origin in foods; validated laboratory protocols for biological agents in food; and handheld low-level chemical detector for chemical warfare agents and toxic industrial. ($ 5.470 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) EXPLOSIVES DETECTION & DEFEAT. Complete development of a hand-held ion mobility spectrometer (IMS) explosives detector; a prototype single-sided neutron interrogation unit for the diagnosing of explosives, chemicals and radiological materials; a flat-panel imager for a digital x-ray system; a variable voltage x-ray source; a hardened luggage container; final prototype dilute-explosive-tile technology for LVB countermeasures; LVB disablement tool enhancement; 90mm recoilless mount; characterization of EOD tools including the High Energy Access and Disablement system; an IED standard operating procedures matrix; standoff connectivity and command unit, and the development of software codes for integrating robotic modular PC based control architecture. Continue laser-based system for standoff detection of explosives; canine selection and breeding process studies; quantum resonance explosive portal detection unit; and characterization of IED/LVB countermeasure tools. Start development of an associated-particle based systems for standoff detection of explosives; low cost sensor detectors; a field-portable one-sided x-ray system; low cost marking agent development; next generation EOD robotic system; and a precision IED disruption device. ($ 4.253 million)

(U) INFRASTRUCTURE PROTECTION. Complete development of a hacker publications, tools, and methodologies database and flash read only memory (ROM) vulnerabilities countermeasures tool; development of an automated infrastructure analysis tool for electric power grids and measurements for the unconventional weapon characterization and effects database. Continue development of computer/software security and network intrusion detection tools and water pipeline database. Start development of computer security training aides; experience-based training tools for automated information system (AIS) administrators; interdependency analysis tools; file beacons; an automatic indications and warnings system for cyber attacks; and an advanced communication firewall system. ($ 2.435 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) INVESTIGATIVE SUPPORT AND FORENSICS. Complete first responder's tool set for emergency response and management; passive medium and long-wavelength beacons; improved fingerprint powders; post blast identification of explosive trace evidence; and firearms impression recovery on hands. Continue development of a technique to determine geographic source/origin of explosives and organic materials (based on stable isotopic ratios); DNA recovery and analysis tools; enhanced handwriting analysis and questioned document examination; forensic software examination tools; document ink age determination; glass evidence databases; remote detection of deception; latent fingerprint recovery (color and fluorescence); chemical tags for devices and documents; and a virtual library system. Start development of standardized evaluation of latent print developers; computer forensic tool verification capability; file recovery utility; improved audio tape enhancement; improved video tape enhancement; authentication of digital video images; reliable audio voice identification; morphological reconstruction of shredded documents; handwriting comparison of different character sets; non-electronic tags; digital radio microphone system; and a miniature solid state recorder. ($ 3.575 million)

(U) PERSONNEL PROTECTION. Complete analysis of fully armored Suburban suspension system; development of advanced 2-piece wheels for beadlock runflat tires used for fully armored limousines; an advanced transparent portable shield; laser and projectile threat databases; evaluation of advanced lightweight transparent armor, Transarm; and the effectiveness of advanced armor piercing projectiles with recommended armor design actions. Continue development of a bullet countermeasure system; lightweight hybrid composite vehicle armor; and analysis of the effects associated with sheet metal enhancing performance of armor piercing projectiles. Start analysis of body armor including aging and environmental effects on soft body armor with guidelines for replacement; vulnerability evaluation of female body armor; body armor cooling system; development of ice pick resistant body armor design and testing; passive passenger restraint system; validation of vehicle blast models and transparent armor performance models; and evaluation of the performance of large samples of transparent armor (Aluminum Oxynitride (ALON)) against the multi-hit threat. ($2.490 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) PHYSICAL SECURITY. Complete development of a mobile, gamma-ray imaging system for the inspection of vehicles and cargo at entry control points; a high volume mail scanner to screen flat mail and parcels for IEDs at large fixed mail centers; and a mobile mail scanner system for field use to screen flat mail and parcels for IEDs. Continue development of blast mitigation techniques for use in pre and post-construction settings; automated vulnerability assessment tools; advanced intruder detection sensors; security engineering manuals for baseline antiterrorism/force protection military construction standards; video-based perimeter intrusion detection systems; semi-automated undervehicle inspection system; a man-portable, motion activated electronic trip flare; a modular, open architecture system to provide intelligent vulnerability assessment, consequence and risk management tools; and test and installation of retrofits for specific facility upgrades for the EUCOM. Start shipboard security and defense system and ground surveillance radar for perimeter intrusion detection. ($ 15.637 million)

(U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Complete development of a system that uses pattern recognition technology across multiple data sources to identify known terrorists who attempt to enter the U.S. through formal entry points; a hand-held RF tracking system; and a wireless transmission system for full-motion video. Continue development of specialized security and surveillance equipment that use facial recognition technology and integrate into database name search and recognition. Start development of Information Operations weapon system, and of a video surveillance toolkit. ($ 4.970 million)

(U) TACTICAL OPERATIONS SUPPORT. Complete development of the advanced low halo night vision tubes. Continue development of advanced night vision system that fuses thermal and intensified images; display system for through-wall imaging systems; personal navigation system for use when GPS is not available; and development and testing of hand held chemical agent detector. Start test and evaluation of small self-contained breathing apparatus; development of a wireless, secure, low probability of intercept/detect interior communications system for use in high speed assault craft; development of an ultra-high noise-canceling microphone for use in high noise environments; a close quarter battle carbine; a weapons video display to provide images to the weapon user from thermal and video sources; and a high data rate communications antenna for field support of tactical missions ($ 5.790 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) PROGRAM MANAGEMENT. Continue to provide program management oversight and technical support for all CTTS R&D projects including funds from other agencies and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Act as the interface to other government agencies for CTTS related initiatives and on-going projects. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency and international participation for the identification and prioritization of CTTS mission area requirements. Direct the program/project planning and execution for projects and associated contracts using direct and indirect budget allocations. Includes management and closeout of existing contracts and solicitation for new initiatives. Enhance the CTTS automated approach to the BAA solicitation process. Review and revise existing process and execution plans for CTTS mission area management and internal and external reporting responsibilities. ($ 4.232 million)

(U) FY 2002 Plans:

(U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Complete development of biocontaminant detection and identification strategies and protocols; advanced aerogel sampling system for biological and chemical agents; layered bed mask filters providing protection against selected toxic industrial chemicals and chemical warfare agents. Continue development of an advanced escape mask effective against a with wide range of chemical threats; advanced building collective protection filtration materials; microbial risk assessment of agents of biological origin in food; handheld low-level chemical detector for chemical warfare agents and toxic industrial chemicals; and validated laboratory protocols for biological agents in food. Start development of personnel protective equipment with special emphasis on improved interface design, ease of use and low-cost; fiber-optic chemical and biological sensor; and continuous operation chemical agent detector for use in facility monitoring. ($ 2.771 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) EXPLOSIVES DETECTION & DEFEAT. Complete canine selection and breedin g process assessments; a prototype precision IED disruption device; laser based system for standoff detection of explosives; quantum resonance explosive portal detection unit; characterization of IED/LVB countermeasure tools; and low cost sensor detectors. Continue development of associated particle based systems for standoff detection of explosives; next generation EOD robotic system; a field-portable one-sided x-ray system; and low cost marking agent development. Start development of a microwave system for standoff detection of explosives; detection technology to be used against advanced sensor threats; directional remote LVB disablement charges; enhanced IED/LVB countermeasure tools; enhanced IED detection, diagnostic, and render safe tools; and target recognition algorithms for detection and identification of potential IED components. ($5.455 million)

(U) INFRASTRUCTURE PROTECTION. Complete the development of water pipeline database; computer security training aides; experience-based training tools for AIS administrators; and an automatic indications and warnings system for cyber attacks. Continue development of computer/software security and network intrusion detection tools; file beacons; advanced communication firewall system; and interdependency analysis tools. Start all source threat analysis to critical infrastructure sectors with emphasis on interdependencies; assessment of commercial energy infrastructure systems to non-lethal weapons and technologies; development of tool to monitor propagation of malicious computer software code; and an external network surveillance tool for defense against large scale attacks. ($ 2.013 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) INVESTIGATIVE SUPPORT AND FORENSICS. Complete development of DNA recovery and analysis tools; standardized evaluation of latent print developers; file recovery utility; document ink age determination; glass evidence databases; remote detection of deception; improved audio tape enhancement; improved video tape enhancement; authentication of digital video images; reliable audio voice identification; latent fingerprint recovery (color and fluorescence); handwriting comparison of different character sets; chemical tags for devices and documents; non-electronic tags; digital radio microphone system; miniature solid state recorder; and, virtual library system. Continue technique for the determination of the geographic source/origin of explosives and organic materials (based on stable isotopic ratios); enhanced handwriting analysis and questioned document examination; forensic software examination tools; computer forensic tool verification capability; and morphological reconstruction of shredded documents. Start ink jet printer characterization; forensic genomic (DNA) technology for combating terrorism; 3-dimensional photogrammetry for terrorism event reconstruction; microrobotic crime scene platforms; hazardous forensic evidence technology; forensic nanotechnology; explosives and arson forensic evidence recovery; and deployable material science/metallurgical analysis. ($ 3.885 million)

(U) PERSONNEL PROTECTION. Complete analysis of the effects associated with sheet metal enhancing performance of armor piercing projectiles; development of lightweight hybrid composite vehicle armor; evaluation of the performance of large samples of transparent armor (Aluminum Oxynitride (ALON)) against the multi-hit threat; development of lightweight body armor cooling system; and development of ice pick resistant body armor design and testing. Continue evaluation of female body armor; evaluation of aging and environmental effects on soft body armor; validation of vehicle blast and transparent armor models; development of bullet countermeasure system; and passive passenger restraint system. Start development of fully armored vehicle standards.
($ 4.526 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) PHYSICAL SECURITY. Complete development of security engineering manuals for baseline antiterrorism/force protection military construction standards; a modular, open architecture system to provide intelligent vulnerability assessment, consequence and risk management tools; video-based perimeter intrusion detection systems; semi-automated undervehicle inspection system; and a man-portable, motion activated electronic trip flare. Continue developing blast mitigation techniques for use in pre and post-construction settings; automated vulnerability assessment tools; advanced intruder detection sensors; shipboard security and defense system; ground surveillance radar for perimeter intrusion detection; and test and installation of retrofits for specific facility upgrades to support EUCOM. Start enhancement of glass penetration model; development of fabric blast shield for building exteriors; and entry point screening testing for chemical agents. ($ 12.820 million)

(U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Complete security and surveillance systems using facial recognition technologies and integrating into the database name search and recognition system and video surveillance toolkit. Continue development of equipment for Information Operations weapon system. Start RF tag miniaturization and the development of advanced CT information system. ($ 3.168 million)

(U) TACTICAL OPERATIONS SUPPORT. Complete development of advanced night vision system that fuses thermal and intensified images; prototype brief case size personal navigation system for use when GPS is not available; an ultra-high noise canceling microphone; and test and evaluation of a small self-contained breathing apparatus. Continue development of close quarter battle carbine; development and testing of hand held chemical agent detector; display system for through-wall imaging systems; development of a wireless, secure, low probability of intercept/detection interior communications system for use in high speed assault craft; a weapons video display to provide images to the weapon user from thermal and/or video sources; and a high data rate communications antenna for field support of tactical missions. Start development of a hand held personal navigation system for use in environments where GPS is not available based on the earlier prototype system. ($ 4.224 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) PROGRAM MANAGEMENT. Continue to provide program management oversight and technical support for all CTTS R&D projects including funds from other agencies and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Act as the interface to other government agencies for CTTS related initiatives and on-going projects. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program/project planning and execution for projects and associated contracts using direct and indirect budget allocations. Includes management and closeout of existing contracts and the solicitation for an increasing volume of new initiatives. Review and revise existing process and execution plans for CTTS mission area management and internal and external reporting responsibilities. ($ 3.381 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	55.324	48.852	42.243						Continuing	Continuing
Special Operations/Low Intensity Conflict (SO/LIC)/P205	1.308	0.000	0.000						Continuing	Continuing

(U) Project Number and Title: P205 Special Operations/Low Intensity Conflict (SO/LIC)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U)The FY 2000 program include: Integrating Information Operations, Psychological Operations, and Public Diplomacy; Joint SOF Requirements and Technologies Analysis; Defense Expenditures on Low-Intensity Conflict Activities; Determine Future Roles and Missions of Special Operations Forces; Preparing for Foreign Urban Counter-Insurgency; Interagency Requirements for Future Urban Counter-Insurgency Operations; Complex Adaptive Systems Modeling for Special Operations.($ 1.308 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	55.324	48.852	42.243						Continuing	Continuing
Explosive Ordnance Disposal/Low Intensity Conflict/P206	7.420	0.000	0.000						Continuing	Continuing

(U) Project Number and Title: P206 Explosive Ordnance Disposal/Low Intensity Conflict

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Complete evaluation of a remote field disassembly system. Complete development of a limpet mine detection system. Complete development of an improved underwater demolition charge. Complete development of a limpet mine neutralization tool. Complete development of a hull acoustic navigation system for diver`s search. Complete development of an EOD incident site command, control and communications system. Complete development of an advanced EOD tactical information system. Complete development of SuperQuick fuze countermeasures. ($ 1.050 million)

(U) Continue development of an EOD laser ordnance neutralization system. Continue development of SOF/EOD tactical decision aids. Continue development of advanced EOD explosive storage system. Continue development of the RAMS/AFS interface. Continue development of an integrated explosive device training system. Continue development of a vehicle access/disruption device. Continue development of a remote EOD mini-reconnaissance vehicle. Continue development of a SOF/EOD personal digital assistant. Continue development of a thermite containment system. Continue development of SOC-R ballistic protection.($ 3.684 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Combating Terrorism Technology Support **PE 0603122D8Z**

(U) Start development of an autonomous search/hydrographic system upgrade. Start development of an RF-controlled digital x-ray imaging system. Start development of a single sided x-ray. Start development of x-ray interpreter hardware/software. Start development of an EOD communications headset. Start development of a chemical/biological/nuclear detector for EOD robots. Start development of chemical leak seal. Start development of a magneto-inductive firing device. Start development of a portable blast chamber. Start development of a high-resolution miniature color diver display system. Start development of a hand-held explosive vapor detector. Start development of an incident site mapping and backpack communications capability. Start development of an integrated remotely operated underwater vehicle, with hull navigation and limpet mine detection sonar. Start development of an advanced remote underwater search vehicle system. Start development of a tactical global broadcasting system receiver.
($ 2.686 million)

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(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	55.449	41.307	42.004	Continuing
Appropriated Value		49.307		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.125	-0.455	0.000	
c. Other	0.000	-0.000	0.239	Continuing
Current President's Budget	55.324	48.852	42.243	Continuing

Change Summary Explanation

(U) Funding: The FY 2000 funding adjustment was reflected as a source in the FY 2000 Omnibus Reprogramming. In FY2001, PE 0603122D8Z was realigned. PE 0603122D8Z, which was renamed Combating Terrorism Technology Support is comprised only of P484. P205 and P206 were moved to PE 0603121D8Z, Alternative to Land Mines, which was renamed SO/LIC Advanced Development. FY 2001 reductions reflect Section 8086 adjustments.

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(U) **Schedule**: N/A

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Joint DoD/DOE Munitions **PE 0603225D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	14.237	16.516	19.178						Continuing	Continuing
DoD/DOE Munitiond/P225	14.237	16.516	19.178						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) This R&D program is a cooperative, jointly funded effort between DoD and DOE to pursue new and innovative warhead, explosive, and fuze technologies in order to bring about major improvements in non-nuclear munitions. This program supports the development and exploration of new munitions concepts and technology preceding system engineering development. Through our funding arrangement with DOE, DoD resources are matched. More importantly, this relatively small DoD contribution effectively taps the annual billion-dollar DOE RDT&E investment by accessing the specialized skills, scientific equipment, facilities and computational tools not available in DoD.

(U) The effort exploits the extensive and highly developed technology base resident in the National Laboratories relevant to achieving the goal of developing capable, cost-effective conventional munitions, and leverages DoD investments with matching DOE investments. The current program supports 37 projects in warhead technology, energetic materials, advanced initiation and fuze development, munitions lifecycle technology, and computer simulation. A specific Service laboratory sponsors each of these projects. The program is administered and reviewed by a Joint Technical Advisory Committee composed of members from the Army, Navy, Air Force, OSD, and DOE. Projects are peer-reviewed semi-annually by DoD Service Laboratory/Technical Center personnel in order to monitor technical excellence and ensure that the technologies under development address priority DoD needs. The program is integrated with Service efforts through the Project Reliance Weapons Panel and participation in the Defense Technology Area Plan for Conventional Weapons. The program is reviewed under the Technology Area Review and Assessment process.

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COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	14.237	16.516	19.178						Continuing	Continuing
DoD/DOE Munitiond/P225	14.237	16.516	19.178						Continuing	Continuing

(U) Project Number and Title: P225 DoD/DOE Munitions

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

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(U) Advanced initiation is an enabling technology for the next generation of warheads. It supports the development of advanced aimable warheads, target-adaptable warheads, and survivable high-velocity hard target penetrators. This program continues to provide improved component options and new architectures for use in advanced electronic safing, arming and firing systems. The objective is to provide a set of characterized, qualified, generic components (and suppliers) and to demonstrate their use in prototype designs. In FY1997 an effort was initiated to reduce the size and cost of electronic safing and arming devices (ESAD) by a factor of 10 over currently fielded technology. Utilizing newly developed and qualified all-commercial components, a low-energy prototype ESAD was demonstrated this year that represents a factor of 10 reduction in size and a factor of 4 reduction in cost. While this technology enables significant improvement in weapon design and capability, cost remains a barrier to utilization in low-cost, mass-produced munitions. An analysis of the cost drivers shows that we are close to the limits with the current component designs and architectures. Therefore, the focus of the component effort was shifted this year to exploit recent advances in microelectronics, micro-electromechanical systems, micro-lasers and optical initiation. These new technologies offer opportunities for increased operational capability from micro firing systems along with a further order-of-magnitude decrease in size and reduced cost. Efforts continued on component shock hardening and packaging in support of Service initiatives in high-velocity penetrators. Chip slapper detonators, ceramic capacitors, and the new MCT semiconductor switches were tested in a single axis at representative shock levels with no performance loss. A divided Hopkinson bar apparatus is under development to simultaneously test ESAD components in multi-axis shock environments as defined from instrumented high-velocity penetration tests. To preserve and transition the advanced electronic initiation technology base developed under this program, a computerized knowledge base is under development on design, manufacture, test and surveillance. Sections on slapper detonator technology were completed this year. This classified tool will ensure experience retention in archives and support government laboratories and contractors.($ 2.810 million)

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(U) DoD and DOE have very similar requirements for energetic materials. Both agencies desire high explosives with increased or tailored performance and decreased sensitivity, and recent accomplishments have benefited both agencies. Like advanced initiation, improved energetic materials are enabling technology for the next generation of weapon systems that will be safer, smaller and more lethal. Under this program a combination of evolutionary and novel technologies are under development. Conventional chemistry has been used to develop more powerful, less sensitive explosives. Nano-structured and engineered materials are being explored to increase energy density and energy on target by factors of three or more. Higher risk efforts are also underway to explore the possibility of metastable High Energy Density Materials (HEDM). Using conventional chemistry a number of new candidate molecules have been synthesized, characterized and formulated. The development of new materials is based on theoretical molecular design. The structure, performance and sensitivity of new molecules are predicted computationally, then synthesis is attempted. The focus is in two areas: molecules with significantly increased energy over current materials and very insensitive materials with reasonable energies. A new molecule, LLM-121, with a predicted energy density greater than CL-20 has been made. Characterization work is pending the crystallization of the material in pure form. As reported last year, another new explosive under development is LLM-105. It is dense, thermally stable and very insensitive. With 30% more energy than TNT it has possible detonator and booster applications and is an alternative to TATB in special purpose weapons such as hard target penetrators that have to survive high shock loadings. The characterization of this material is essentially complete and formulation work is underway for possible weapons applications. Metastable Intermolecular Composites (MIC) developed under this program were the first successful examples of nano-structured energetic materials with significantly enhanced performance. They demonstrated that tailored, ultra-fine reactant particles could dramatically increase the energy release rate of thermite-like materials and provide twice the total energy of high explosives. The first application of this technology is for lead-free percussion primers for small arms ammunition, and this program is now in engineering development under SERDP funding. A new bulk process for manufacturing nano-structured energetic materials using sol-gel chemistry has now been developed with the promise of precise control of material homogeneity, properties, and geometry. Additional applications of the material are under evaluation including reactive warheads that better couple energy to the target and applications that require very high thermal loadings. Extended solid HEDMs are also under development. This work uses intense pressure and temperature to force elements into highly energetic bonding states that can be recovered to ambient conditions. Current synthesis techniques have produced CO-derived solids and a family of novel nitrogen materials, but in very small quantities. These materials are expected to be highly energetic, but characterizing them, and particularly verifying the energy content, has been difficult due to the microscopic quantities of material available. The two principal activities this year have been in improving

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the diagnostics used to characterize the new HEDMs and the design of a new bulk quantity synthesis capability. The creation of the thermochemical code Cheetah represents a major accomplishment of this program. The code predicts the performance of energetic materials including high explosives, propellants and pyrotechnics and reduces the number of tests necessary to develop a new material. Cheetah 3.0 will be released this year to more than 300 DoD, DOE and DoD contractor users. This version includes new equations of state resulting in greatly enhanced stability and accuracy of the code. A major effort is also underway to develop a suite of codes for use in predicting the response of energetic materials in weapon systems subjected to thermal and mechanical insult. The objective is to reduce the number and cost of the current go/no-go insensitive munitions test protocols required to qualify a new system for military use and to improve our understanding of the physical mechanisms and safety margins. First-generation tools for use in analyzing cookoff accidents have been developed. During this year a collaborative effort with the Navy was initiated to experimentally assess and validate these codes for use in predicting the response of weapon systems including the violence of reaction in cookoff accidents. Quantitative data on cookoff violence have been generated by both the Navy in small-scale experiments and by DOE in the scaled thermal explosion experiments. Data on both HMX based explosives and PBX-109 have been obtained for use in establishing the accuracy and range of validity of the predictive models. ($ 3.960 million)

(U) Lagrangian and Eulerian hydrocodes, coupled code systems, arbitrary Lagrangian-Eulerian (ALE) codes, and supporting materials models and constitutive relations developed at the nuclear weapons laboratories have been improved and adapted to DoD problems and transitioned to the DoD user community for use in warhead design and evaluation. This program provides prompt and direct access to the substantial investments in computational mechanics and materials modeling by the DOE and acts as the conduit for transition. Specific activities supporting the technology transition include distribution of computational tools to the DoD community, support of DOE codes on centralized DoD computing systems, training of the user community, and consulting as needed.

($ 2.307 million)

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(U) A major thrust of this program is hard target defeat. A new concept for hard target weapons, the Monolithic Ballasted Penetrator, has been developed for high-velocity delivery that significantly increases penetration into concrete and payload volume. A 2/3-scale prototype was designed, built and tested at 3350 fps. The penetrator successfully penetrated 15 feet of concrete. Although erosion and nose recession occurred, the penetrator nose remained sharp and symmetrical, and the penetrator maintained a stable trajectory. Differences have always been observed in predictions from different hard target design codes. Global parameters such as penetration depth are tending to converge, but differences in important details such as the maximum deceleration and trajectory remain. The results can be contradictory predictions about penetrator survival or weapon effectiveness at conditions near the design envelope. To address this issue an experimental test-bed program was initiated to collect high-quality data on well-characterized targets for use in code comparisons and validation. The first series of tests has been completed that is expected to resolve questions about the effect of target strength, nose shape, penetrator scale, and penetrator velocity. Advanced materials were evaluated for high-velocity applications. Collaborative studies are underway on an Air Force identified low-alloy steel that holds promise as a low-cost replacement for current ultra-high-strength steels being postulated for future high-velocity penetrators. Metallography, mechanical property, and chemical and processing tests indicate that the material has good potential and further study is warranted. Payload survivability during high-velocity impacts was studied in a joint program with the Navy. A mid-scale penetrator loaded with LX-17, an extremely insensitive explosive, was tested at the end of FY1999. Both the penetrator and explosive survived the impact intact. The penetrator has been remotely disassembled and visual inspections and small-scale safety testing completed. No change in the properties of the explosive and no cracking or other impact related deformities were observed. These results demonstrate that a viable baseline payload exists for high-velocity penetrators. In an alternative approach to hard target defeat, work is underway on developing the concept of using a multiple shaped charge array as a precursor warhead to increase the penetration into concrete of a follow-through penetrator. In tests conducted at China Lake, multiple shaped charges fired simultaneously were shown to increase the mass of concrete removed from a target by a factor of four over that from the multiple shaped charges fired individually. This verifies the hypothesis that jet interactions can augment structural damage. Relating warhead performance to material properties requires a detailed knowledge of material properties under dynamic conditions and is considered a fundamental issue in computationally based design of future weapon systems. Additional progress has been made in demonstrating how impurity levels and grain size combine to affect the material behavior in shaped charge liners. New processing techniques were developed that produce an exceptionally fine grain structure in shaped charge liners and result in increased jet ductility. This work is important for developing long-standoff warheads for application to counter active protection systems. Our understanding of the effects of surface finish, microstructure and

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metallurgy on Ta explosively formed penetrators (EFP) is improving, resulting in designs with more consistent performance. An experimental test-bed program was initiated to examine important material properties and processing variables in Ta liners and to validate advanced materials models. For the first time, a highly time-resolved measurement was made of infrared emission from a shocked metal surface. This information provides a valuable test of the accuracy of material models used in design codes for advanced munitions.($ 3.370 million)

(U) DoD and DOE efforts toward munitions lifecycle technologies including stockpile aging, surveillance, demilitarization and disposal are coordinated under the auspices of this program. As the focus for demilitarization and disposal in DoD turns from open-burn and open-detonation to resource recycle and recovery, alternative technologies are required to turn waste materials into useful products. The potential for cutting explosives both bare and encased in steel has been demonstrated using a femtosecond laser. Unlike conventional cutting lasers that melt and vaporize material, the femtosecond laser ablates material with no evidence of heating. It offers unique capabilities for use in munitions demilitarization and manufacture. A dedicated femtosecond laser has been built in conjunction with a small blast chamber for use in scoping experiments. Work was also initiated to prepare a 10-kg explosive tank for use with laser cutting to allow exploration of demilitarization operations on full-scale munitions. The laser was used to demonstrate the defuzing of the Multiple Launch Rocket System grenade to allow its re-use. To provide automated remote capability for munition demilitarization activities a robotic workcell for disassembling 155-mm projectiles was designed and assembled. High-level software was written for remote disassembly of artillery shells to expose the submunition layers for handling and safing. When completed next year, it will provide the capability to completely disassemble the M483A1 rounds containing 88 bomblets. Age-related degradation of materials within high value weapon systems is studied in order to understand and predict changes in munition safety, performance and reliability during long term storage. Predictive models for materials and system aging are under development with a focus on solder interconnect reliability, corrosion of electronics with an emphasis on plastic encapsulated microcircuits, the aging of propellants, and the aging and fracture of adhesive joints. In the solder reliability task physical models were completed that calculate the evolution of microstructure deformation due to thermomechanical fatigue in Sn-Pb solder interconnections and validated using laboratory test samples and fielded test hardware. The goal of the task is to develop a computational tool that predicts the overall reliability of Sn-Pb solder interconnections of any geometry from physically-based calculations of deformation and crack damage ($ 1.790 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) FY 2001 Plans:

(U) Improvement of electronic safing, arming and firing systems will continue with a focus on miniaturization, cost reduction and shock survivability for hard target penetrators. The development of a micro firing system will continue with a design goal of a further factor of 10 reduction in size over the recently demonstrated low-energy systems (and a factor of 100 over currently fielded technology.) Activities will include component development and evaluation, improved system integration, and demonstration of manufacturing technologies. Fabrication of nano-structured capacitors and micro-electromechanical transformers and other safe and arm components will be demonstrated, and system tests will be initiated. Chip slapper detonators were recently qualified for fleet use by the Navy. To provide continued support for system applications a reliability study on performance as a function of electrical input will be defined and conducted jointly with the Navy. In addition an extensive program of detonator testing across the range of required environmental conditions, including cold, temperature cycling and humidity will be initiated to evaluate long-term reliability of the low-energy chip slapper assemblies in realistic military environments. Component testing in shock environments and the development of packaging technology will continue in support of Service initiatives in hard target munitions. A unique experimental capability for testing component response to simultaneous multi-axis shocks was developed and will be used to simulate realistic system shock environments. Multipoint detonator arrays are used in advanced aimable and target-adaptable warheads, and arrays of 4 to 112 detonators have been successfully produced and fired. However, large multipoint firings must be conducted at voltages well above the predicted threshold values for individual detonators to ensure reliable performance of all of the points. Severe current oscillations have been observed in physically large multipoint circuits and appear to be responsible for the anomalous behavior of the detonators. An experimental effort has been undertaken which should confirm the mechanism responsible for the oscillations and provide a path for developing mitigation schemes and more robust multipoint designs. ($ 3.290 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) Work in energetic materials will be aligned with the recommendations from the DoD 2000 Weapons Technical Area Review and Assessment (TARA). They expressed concern over the decline in DoD core investments in energetic materials and recommended a national initiative in high energy density materials to maintain weapon lethality as weapon and platform size decrease. They specifically emphasized the need to exploit opportunities in nano-energetics. Efforts sponsored under this program are consistent with their comments. The development and characterization of new insensitive and new high-energy, high-power materials will continue with synthesis based on theoretical molecular design. The predicted performance and material sensitivity properties of the new high-energy molecule LLM-121 will be confirmed, and detonator and booster applications of the very insensitive LLM-105 will continue to be developed. The investigation of sol-gel chemistry as a bulk manufacturing process for nano-structured energetic materials will continue with a focus on material consistency, material characterization and process scale-up. Of particular interest is the development and evaluation of engineered pyrotechnics using this process. Samples materials will be provided to others in the DoD energetics community for weapons evaluations. The creation of new HEDMs will continue, along with the development and implementation of accurate techniques for determining the crystal structure and energy content of the newly synthesized materials. The new bulk quantity synthesis capability will be established with the installation of a special press designed to produce sample sizes of 100 mm3. At this scale the energy content can be measured using standard techniques with great reliability and accuracy. With the release of Cheetah 3.0 the emphasis in Cheetah development will turn towards implementing more sophisticated kinetic models into the code that can account for differences in explosive microstructure including explosive particle morphology and towards generating more accurate equations of state for detonation products. To support this work a new impulsive stimulated light scattering spectrometer will be used to conduct measurements in a diamond cell to monitor the onset of chemical reactivity at extreme conditions with great accuracy. Efforts to develop and validate computational tools for predicting munition system response to operational threat and accident environments will continue. The joint experimental program with Navy to measure the violence of reaction in cookoff accidents will be expanded from simple to complex geometry tests. The simulation tools will be exercised against these data to validate the models and expand their ability to predict weapon system performance and response in accident situations. The response of energetic materials to low strain-rate deformations, where the mechanical properties of the materials control the energetic response, is also under investigation. Experimental data on the dynamic stress-strain response of both the crystalline energetic material as well as the non-energetic binders used in currently fielded explosives will be generated to support the development of predictive computational tools. ($ 4.526 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) The development of Eulerian, Lagrangian, coupled and ALE codes relevant to the design and evaluation of munitions will continue. Efforts will continue in the development, implementation and validation of material constitutive and failure models supporting the simulation of warhead formation and warhead/target interactions. The program also provides a conduit to the improved materials models emerging from the DOE Advanced Strategic Computing Initiative providing high resolution, accurate predictions of materials behavior and failure relevant to the analyses of weapon systems. The transition and support of these tools and models along with user training will be provided as needed.($ 2.410 million)

(U) Testing of the Monolithic Ballasted Penetrator will be completed with a 2/3-scale prototype fired against an oblique concrete target to evaluate penetrator behavior and performance. Data from the small-scale experiments performed in FY2000 on oblique entry into rock targets will be evaluated and used to improve the modeling of target entry dynamics and in-target trajectories. The experimental test-bed program for code validation will continue. The data package from the first instrumented test series will be provided to the community for benchmarking and validating the various hard target penetrator design tools. The objective is to identify and resolve differences in the models and calculations. Evaluation of the Air Force experimental steel will continue with measurements of its dynamic properties and further studies of processing variables that contribute to its strength and toughness. As follow-on to the Navy payload survivability study, the program will support further testing to gather data useful to fuze designers. On-board instrumentation will be provided to the Navy for use in gathering realistic penetration environments during hard target penetration events. In the study of precursor charges for hard target weapons, the use of multiple simultaneous shaped charge jet impacts has been shown to significantly increase target damage. The concept will be further explored in tests against full-scale targets at China Lake where precursor designs, charge arrays, and liner materials will be evaluated. The study of dynamic material properties will continue with a focus on the role of processing, impurities and microstructure on the dynamic behavior of warhead liner materials. The objective of this work is to understand and exploit the effects of processing. To evaluate the accuracy of the current materials models, an experimental Ta liner test-bed program was undertaken. In this study Ta EFP liners have been fabricated to a generic design by four different process routes resulting in four well-characterized microstructures. The resulting liners will be fired and the slugs will be soft caught and compared to the shapes predicted by the advanced materials models. Infrared thermometry measurements of shocked metal plates will continue based on the success in FY2000.($ 3.830 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) A process has been developed that utilizes waste Explosive D available from demilitarization operations to form picramide, the starting material for synthesis of the insensitive explosive TATB, a high value product for both DoD and DOE. This process, which was demonstrated in FY2000, will be scaled-up from 1 kg to 10 kg in collaboration with Mason and Hangar, Amarillo, Texas, in support of a Navy manufacturing technology program to commercialize the process planned to start in FY2001. Exploitation of femtosecond laser cutting and machining of explosives for both munitions demilitarization and manufacturing will continue. The emphasis this year will be on the determination of optimum cutting parameters, safety limits, and geometry limits for munitions related materials and high explosives, and on the preparation of the 10-kg explosive tank for use with laser cutting. A parallel modeling effort will study femtosecond time-scale kinetics of the interaction of a laser pulse with energetic material. Work on the robotic workcell will focus on completing the technologies required to transition the existing M483A1 automated disassembly workcell into a production system. The complete remote disassembly of 155-mm artillery shells to expose the submunition layers for handling and safing will be demonstrated. The ultimate program goal is to implement integrated vision capabilities with force control and compliant tooling to demonstrate completely automated disassembly of a cluster munition with safing of the individual submunitions. Development of materials and system aging models will continue in the areas of solder interconnects, plastic encapsulated microcircuits, propellants, and adhesive joints. A model for the reliability of plastic encapsulated microcircuits in dormant storage will be completed and validated using field and accelerated aging information. This is an important area for DoD because commercial specifications and test protocols used for electronic components do not accurately represent the long-term storage times and conditions relevant for DoD munitions.($ 2.460 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) FY 2002 Plans:

(U) Continue the development and demonstration of improved components and architectures for robust, low-cost, miniature safing, arming and firing systems. Demonstrate a prototype micro fireset based on microelectronics and micro-electromechanical components. Continue component development and evaluation and explore commercial sources for manufacturing. The program goal is a factor of 10 reduction in fireset size over the current low-energy designs. Continue the testing program on chip slapper detonators to evaluate long-term performance and reliability in realistic military environments. Complete the characterization of detonators, capacitors, switches, etc. in shock environments for application to hard target munitions toward the program goal of demonstrating a prototype ESAD in a high-velocity penetrator. Resolve the design issues causing current oscillations in multipoint detonator arrays utilizing low-energy chip slapper detonators and develop improved design principals. Prepare for the large multipoint array demonstrations and begin transition of the technology to DoD contractors. Continue to support and develop the knowledge base tool for preservation of advanced initiation technology. Expand its scope to include other fireset components beyond detonators.($ 3.370 million)

(U) Continue efforts to synthesize, characterize and scale-up new energetic materials with increased or tailored performance and decreased sensitivity. Complete the formulation work toward the development and qualification of an LLM-105 booster explosive. Continue the development of nano-structured and engineered energetic materials, including sol-gel derived materials, and evaluate their effectiveness and utility for warhead applications. Demonstrate the feasibility of bulk synthesis on CO-derived and nitrogen HEDMs and complete initial measurements of their energy content. Explore the synthesis of additional extended solid HEDMs. Continue the development and maintenance of the Cheetah thermochemical code for performance predictions of energetic materials, and provide user support to the DoD community. Exercise the first generation of simulation tools for munitions response to accident environments against test data to validate the codes and expand their ability to predict weapon system performance and response in accident situations. The joint experimental program with Navy to measure the violence of reaction in cookoff accidents will be expanded to testing and analyses of a full weapon system. Experiments to determine mechanical property for both fielded high explosives and their constituents will be executed for use in developing and validating high explosive mechanical response models. ($ 6.843 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) Continue to develop, extend and apply the hydrocodes and associated materials models for warhead design and evaluation. Ongoing code and material model development will continue to focus on greater accuracy, improved physics, and extension to a broader class of real-world problems. Continue to support the transition of these tools, the training and consulting for the DoD user community.($ 2.605 million)

(U) Continue the study of advanced hard target penetrator concepts and adapt designs to state-of-the-art materials and manufacturing methods. Complete the experimental hard target test-bed program for code validation with a series of oblique impact tests into concrete. The focus will be on obtaining data that reveals the dynamic rotations of the penetrator during target entry and the resulting trajectory. The data will be provided to the DoD community for use in validating and benchmarking hard target design tools. Investigate weldability and melt processes to optimize properties and castability of the new Air Force low-cost penetrator steel. Continue the science-based technology projects relating warhead performance to material properties under dynamic conditions as a prelude to improved computational modeling and the transition of improved warhead designs to developmental and fielded weapon systems. Complete the simulations of the Ta liner test-bed experiments and assess the utility of the new materials models. Continue the development and evaluation of powder metallurgy production methods for EFP liners for enhanced anti-armor warhead applications. Initiate the development of advanced aimable warheads exploiting the individually controlled, distributed micro-firesets under development in the advanced initiation task.($ 3.900 million)

(U) Continue the development of femtosecond laser cutting and machining of explosives for both munitions demilitarization and manufacturing operations. Begin large-scale HE tests in preparation for demonstrations on live munitions. Adapt the robotic workcell to the disassembly of Adam mine rounds. Design and simulate the disassembly process, fabricate the hardware and demonstrate the complete remote disassembly of the mine round. Continue the development of materials and system aging models with a focus on predicting the reliability of solder interconnects, plastic encapsulated microcircuits, propellants, and adhesive joints.($ 2.460 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	14.315	16.670	16.785	Continuing
Appropriated Value	0.000	16.670	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.154	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.073	0.000	0.000	
c. Other	0.000	0.000	2.393	
Current President's Budget	14.237	16.516	19.178	Continuing

Change Summary Explanation

(U) **Funding**: FY 2000 fund was identified as a source on the FY 2000 OMNIBUS reprogramming action. FY 2001 reductions reflect Section 8086 adjustments.

(U) **Schedule**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint DoD/DOE Munitions **PE 0603225D8Z**

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3							R-1 ITEM NOMENCLATURE Automatic Target Recognition **PE 0603232D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.488	7.465	7.716						Continuing	Continuing
ATR/P232	7.488	7.465	7.716						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)Automatic Target Recognition (ATR) systems improve the capabilities of our armed forces by enabling them to make better use of the information provided by such military sensor systems as radar, laser, infrared (IR), hyperspectral, identification friend or foe (IFF), and electronic signal measurement (ESM). ATR enhances the combat capabilities of our forces by increasing the lethality and survivability of our weapon systems and decreasing the time required to acquire and identify potential targets. ATR technology reduces our risk of fratricide by augmenting combat identification systems to improve our ability to distinguish between friend, foe, or neutral forces under high stress conditions. ATR technology provides significant workload reduction for the intelligence forces by aiding the image analyst to exploit imagery rapidly and accurately. In an era of decreasing military manpower, improved ATR will enable our forces to handle an ever increasing load of sensory information in the complex situations to be encountered in the military missions of the future. ATR capabilities are becoming essential to the Warfighter, as the Services pursue `network-centric` concepts for exploiting sensor imagery and information acquired through large arrays of sensors at all echelons. An OSD initiative, Smart Sensor Web (SSW), seeks to exploit this concept even further by providing greatly enhanced situational awareness for the Warfighter at the lower echelons, such as the battlefield commander. SSW will leverage on-going Service investments and will critically depend on application of ATR technology to achieve its goals.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Automatic Target Recognition **PE 0603232D8Z**

(U) Increasing ATR operational effectiveness requires research and development to enhance sensors and algorithmic image processing. Additionally, improved, more efficient procedures must be developed for measuring and demonstrating ATR effectiveness. This is very important as the utility of ATR is highly dependent on the quality of the information provided by the sensor system(s) and the ability to process that information effectively to provide reliable decisions with operationally acceptable false alarm rates. Service and Agency ATR efforts have concentrated on algorithm development for conducting post-processing comparison and decision making which exploit improved digital computational capability. This program will focus on determining effectiveness of ATR, establishing benchmark metrics, and conducting and collecting single and multi-sensor data for potential reuse in Service and Agency algorithm development and objective evaluation. Consistent with the 1997 report of the Defense Science Board Task Force on ATR, this program will establish standard tests and procedures to provide an `honest broker` assessment of current leading candidate ATR's, as well as emerging ATR technology for the next generation of ATR systems.

(U) The ATR program funds the integration and demonstration of advanced technology for field experimentation and assessment. The result of the ATR program efforts is the integration of the demonstrated technological capabilities and the capability to assess algorithms and various technologies. This leads to greatly improved understanding of the Joint Warfighting utility when assessed in realistic operational contexts. The Military Services provide air, land, and naval technological superiority, respectively, and ACTDs rapidly prototype and transition technological solutions to specific threat scenarios. This program provides timely resources and flexibility to horizontally integrate technology solutions across Services and Agencies and identify new and emerging `best-in-class` ATR systems with confidence so that this critical technology can be fielded more quickly.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Automatic Target Recognition **PE 0603232D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.488	7.465	7.716						Continuing	Continuing
ATR/P232	7.488	7.465	7.716						Continuing	Continuing

(U) Project Number and Title: P232 ATR

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U)`Best Practices` for standardized ATR evaluation and assessment will be established and promulgated through the Automatic Target Recognition Working Group (ATRWG). Standard metrics to describe ATR performance and associated problem sets will be adopted which cover surveillance, weapon and attack applications of ATR's. The Problem Set generation and ATR evaluation effort to determine `best in class` will be expanded to include more complex ATR functions such as scene analysis, and new sensor types to include hyperspectral and multi-mode sensors. These data sets will be distributed and made available via the VDL. A closer technical relationship will be established between the ATR and Hyperspectral communities, with increased emphasis on technology issues dealing with the assessment of Long Wavelength Infrared (LWIR) hyperspectral imaging for ATR. Initial taxonomy will be defined for hyperspectral algorithms and a preliminary performance assessment will be established and used to refine a system level performance model. A report will be issued comparing optical and digital correlator processing. The first Problem Sets will be delivered and used to evaluate ATR algorithms for SAR imagery, The Services` synthetic image generation capabilities will be applied to multi-spectral ATR's as a means assessing ATR performance over a wider range of operating conditions. During this time period more extensive subsystem technology effectiveness demonstrations will be conducted which support the transition efforts begun in FY99. These efforts will focus on the SADARM and LRAS3 initiatives begun in FY99. Modeling and simulation tasks will be conducted to provide software and hardware in the loop effectiveness analyses refine design requirements and manufacturing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
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approaches. These models and simulations will be used to expand the range of tests and provide greater confidence in ATR field tests, which are limited in scope and duration, to facilitate transition to production programs. An assessment of hyperspectral performance and operational utility will continue as a basis for future investment decisions. The timing of these assessments will be consistent with the current schedules for ASRP flight demos and launches of Warfighter -1 and the Navy Earth Map Observer. Additional efforts will be launched for the development of experimental testbeds by the Services to evaluate advanced `smart` sensor technology for enhancing the situational awareness of the battlefield commander - Smart SensorWeb (SSW). Initial SSW experiments will be conducted at selected test sites.($ 7.488 million)

(U) FY 2001 Plans:

(U) Robustness of selected ATR's will be assessed over a wider range of challenging operating conditions using innovative applications of real, hybrid and synthetic imagery. This effort will support the validation of using multi-spectral synthetic imagery generated `on-demand` for the selected ATR in its operational scenario. The application of such multi-sensor synthetic imagery in High Level Architecture (HLA) simulations will be assessed as a technique to determine dynamically ATR effectiveness. In the hyperspectral area, an end-to-end performance model, incorporating sensor and processor models, will be validated. The end-to-end model will be used to conduct performance and subsystem trade off analyses between hyperspectral sensors and their ATR's. Service models developed to predict ATR performance will be refined to include evolving high fidelity multi-mode sensors. Experimentation for advanced technology assessments for Smart Sensor Web at test sites will continue. Further integration of the SSW sensorwebs will be pursued.($ 7.465 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Automatic Target Recognition **PE 0603232D8Z**

(U) FY 2002 Plans:

(U) Building on the database from sensor data collected during FY01, algorithms will be benchmarked for detection and false alarm performance. Continuing with the sensor fusion initiative started in FY00, technical emphasis will continue to be focused on refining and developing ATR algorithms based on multi-sensor inputs. Using the new classified and unclassified nodes established in FY01 at AFRL and NVESD, performance results and raw data will be distributed and analyzed using the Virtual Distributed Laboratory (VDL). High Performance Computing assets will be incorporated to allow faster access and shorter algorithm processing cycles. The role of synthetic and hybrid data will be expanded in FY02 by comparing ATR algorithm performance for measured vs inserted targets. Hyperspectral databases will be expanded and enhanced using Forest Radiance II and Desert Radiance III data. Hyperspectral ATR performance predictions will be demonstrated. In the ATR transition area, additional IR problem sets will be collected and scoring and analysis methods for moving vehicles will be completed for LRAS3. LADAR algorithms for SADARM II will be demonstrated and evaluated. Mid-wave IR tests will be conducted using RsSTAR.($ 7.716 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Automatic Target Recognition **PE 0603232D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	7.529	7.534	4.673	Continuing
Appropriated Value	0.000	7.534	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.052	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	.229	0.017	0.000	
c. Other	0.000	0.000	3.043	
Current President's Budget	7.488	7.465	7.716	Continuing

Change Summary Explanation

(U) Funding: FY 2000 changes are a result of reprogrammings in support of initial efforts for Smart Sensor Web advanced technology applications. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	R-1 ITEM NOMENCLATURE Automatic Target Recognition **PE 0603232D8Z**

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE June 2001		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE, BUDGET ACTIVITY 3						R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **SPECIAL TECHNOLOGY SUPPORT** **PE 0603704D**				
COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	15.670	29.304	11.019						Continuing	Continuing
Project Name/No. and Subtotal Costs – Special Technology Support/P704	15.670	29.304	11.019						Continuing	Continuing

A. Mission Description and Budget Item Justification:

Brief Description of Element: Special Technology Support to Intelligence and Light Forces is a classified program. See the Congressional Justification Bood for program details.

Program Accomplishments and Plans:

FY 2000 Accomplishments:

- Mission Support (15.670 million)

FY 2001 Plans:

- Mission Support (29.304 million)

FY 2002 Plans:

- Mission Support (11.019 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE April 2001
APPROPRIATION/BUDGET ACTIVITY Research, Development, Test & Evaluation, Defense-wide/BA 3	R-1 ITEM NOMENCLATURE **SPECIAL TECHNOLOGY SUPPORT** **PE 0603704D**

B. Program Change Summary	FY2000	FY2001	FY2002	To Complete	Total Cost
Previous President's Budget Submit	10.948	10.777	10.957	Continuing	Continuing
Appropriated Value		18.800		Continuing	Continuing
Adjustments to Appropriated Value	4.957				
a. Congressionally-directed undistributed reduction	(.172)	(.207)	.62		
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment					
c. Other	(.63)	(.066)		Continuing	Continuing
Current President's Budget	15.670	29.304	11.019	Continuing	Continuing

Change Summary Explanation:

(U) Funding: Funding changes are the result of Congressionally undistributed reductions as well as other program adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

C. Other Program Funding Summary Cost Not Applicable.

D. Schedule Profile Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE JUNE 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3							R-1 ITEM NOMENCLATURE Strategic Environmental Research and Development Program **PE 0603716D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	56.945	59.007	69.376						Continuing	Continuing
SERDP/P470	56.945	59.007	69.376						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)The Strategic Environmental Research and Development Program (SERDP) was established by Congress in 1990 (10 U.S.C. Section 2901-2904) to address Department of Defense (DoD) and Department of Energy (DOE) environmental concerns. It is conducted as a DoD program, jointly planned and executed by the DoD, DOE, and the Environmental Protection Agency (EPA), with strong participation by other Federal agencies, industry, and academia. SERDP`s objective is to improve DoD mission readiness by providing new knowledge, cost-effective technologies, and demonstrations in the areas of environmental cleanup, compliance, conservation, and pollution prevention. SERDP does this by (1) addressing high priority, mission- relevant, defense environmental technology needs necessary to enhance military operations, improve military systems` effectiveness, enhance military training/readiness, and help ensure the safety and welfare of military personnel and their dependents; and (2) enhancing pollution prevention capabilities to reduce operational and life-cycle costs, as well as reducing the cost of necessary cleanup actions and compliance with laws and regulations. As a secondary benefit, SERDP helps solve significant national and international environmental problems. The keys to a growing list of SERDP technological successes are the ability to respond aggressively to these priority defense needs; the pursuit of universal, world-class technical excellence; emphasis on constant technology transfer to field use; and sound fiscal management.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Strategic Environmental Research and Development Program **PE 0603716D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	56.945	59.007	69.376						Continuing	Continuing
SERDP/P470	56.945	59.007	69.376						Continuing	Continuing

(U) Project Number and Title: P470 SERDP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) General:

Solicited proposals from industry, academia, and Federal R&D organizations. Commenced 31 new technology development projects; continued 56 projects; and completed 21 development projects

(U) By Thrust:

(U) Pollution Prevention (25 projects): The focus of pollution prevention is to attain compliance through elimination of pollution at its source. High priority issues include the replacement of Ozone Depleting Chemicals for firefighting; elimination or reduction of regulated air emissions from military operations; the development of environmentally benign explosives and propellants; elimination of Chromium and other heavy metals through both process modifications and development of alternative coatings; and elimination and reduction of hazardous materials associated with weapons systems and depot-level repair facilities.
Specific Accomplishments include:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Strategic Environmental Research and Development Program **PE 0603716D8Z**

Searching for non-structural adhesives containing no VOCs; unrefined microbial extracts derived from microorganisms isolated from extreme environments such as natural hot springs have shown adhesive strength that exceeds that of currently used high VOC content adhesives. Using the trapped vortex combustor for turbine engines; estimates based on sector tests data have demonstrated 50 percent reduction in VOC emissions, and a 55 percent reduction in NOx emissions. This new combustor design is applicable to aircraft, ship and tank engines. A project using a physical vapor deposition technology for the application of environmentally safe coatings for gun barrel bore protection; completed the design, fabricated, and assembled bench-level cylindrical magnetron sputtering demonstrator for 25mm diameter and 6" long gun barrel specimens. Using the materials by design approach, in less than eight months of effort one project has designed and prototyped a corrosion resistant structural stainless steel alloy that meets the primary design objectives of strength for aircraft landing gear applications (equivalent to today's 300M steel) and is likely to eliminate the need for cadmium and chromium coatings.
($ 17.982 million)

(U) Unexploded Ordnance (UXO) (8 projects): Efforts focus on improvement of UXO detection capability, including: innovative methods to identify UXO using acoustic and electromagnetic sensors; and data interpretation/ integration research.

The primary contributor to the high cost and time associated with remediating a UXO contaminated site is the high false-alarm rate. Researchers have made advances in the development of algorithms that substantially reduce false alarm rates associated with individual detection sensors. Advances also have been made to optimally combine information across detection sensors to further reduce UXO false alarm rates.
($ 2.988 million)

(U)Conservation (20 projects): The Conservation Thrust Area supports land managers and natural/cultural resource managers to effectively support military training and testing operations through research in assessment and mitigation of military impacts; ecological modeling and simulation to assess error and uncertainty; and ecosystems management to permit sustainable use of these lands.

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During FY00 SERDP researchers made significant advancements in the assessment and prediction of the effects of military noise on marine mammals, including the completion of the first-ever predicted audiogram for the humpback whale. To enable installation managers and planners to avoid the potential future impacts on training and testing activities on local communities, SERDP has developed computer models that assess the probability and characteristics of future urban development within the vicinity of military installations. Significant advances were made in the development of models to predict habitat probabilities as well as the effects of ecosystem fragmentation on animal populations at military testing and training ranges. When complete, these models will be used to manage threatened and endangered species and their habitats on military installations while minimizing any disruptions to testing and training activities.
($ 11.414 million)

(U)Cleanup (43 projects): Cleanup is focused on the remediation and restoration of past actions. The detection and remediation of DNAPLs remains a ubiquitous and technically challenging problem. The development of risk assessment tools and standards to help determine `how clean is clean` is vital to reducing cleanup costs. Efforts to develop field implementable, cost-effective, in-situ biotreatment processes for remediation of predominant DoD contaminants continue to show promise. The National Environmental Technology Test Sites (NETTS) that facilitate the demonstration and validation of technologies prior to commercialization continue to play a vital role in transitioning technologies to the field.

In FY00 SERDP researchers demonstrated that many organic contaminants (PAH’s) can be bound or sequestered on sediments, rendering them immobile in the environment. To address the growing issue of groundwater contaminated with energetic materials at DoD facilities, researchers have made significant advances in the development of innovative methods to remediate compounds such as TNT, RDX and HMX. SERDP is attacking the widespread problem of determining the extent of and treating dense non-aqueous phase liquids (DNAPLs) in groundwater. SERDP researchers have developed methods for the integrated geophysical detection of sources of DNAPL contamination and are pursuing a variety of in situ treatment technologies.
($ 16.447 million)

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(U)Compliance (22 projects): The Compliance Thrust Area supports waste treatment and disposal, environmental monitoring and environmental management that is not directly related to site restoration but is meeting current and future environmental compliance requirements of DoD and DOE. The reduction of air emissions continues to be a significant driver as many DoD facilities are in air quality non-attainment areas. The development of technologies for the detection and treatment of regulated air pollutants is a key focus. Emerging issues that are addressed include the fate and impact of energetics on DoD training and testing ranges as well as heavy metal contamination in harbors.

During FY00, significant progress has been made in the development of emissions control technologies. An innovative alternative technology was developed to replace Open Burning/Open Detonation of energetics by reacting a bulk energetic material with a chemical that neutralizes the energetic materials in a controlled manner. Another project is using a biofiltration system to control hazardous air pollutant (HAPs) and volatile organic chemical (VOCs)air emissions from DoD painting facilities. Progress has also been made in the development of field-portable environmental monitoring technologies, including two continuous emissions monitors (CEMs), one for gas-phase pollutants and another for metals emissions monitoring. Additionally, developments have been made with respect to advanced methods for the measurement of the size distribution and the chemical composition of fine particulate matter emitted from mobile and stationary DoD sources.
($ 8.114 million)

(U) FY 2001 Plans:

(U)General:

Continue development of environmental technologies that respond to the DoD`s highest priority environmental needs. Commence 42 new R&D projects; continue 42 research and technology development projects; and complete 36 projects.

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(U) By Thrust:

Pollution Prevention (29 projects): Continue efforts on the development of non-ozone depleting chemicals for firefighting; elimination and reduction of hazardous air emissions; development of "Green" energetics; elimination of heavy metals including chromium and cadmium; and elimination or reduction of hazardous materials from DoD weapons systems and platforms.
($ 18.797 million)

(U)Cleanup (36 projects): Technology development efforts will continue to address the remediation high priority pollutants includi ng energetics, chlorinated solvents and ammonium perchlorate. These will include advances in site characterization focusing on optimization of long-term groundwater monitoring systems; Risk Assessment and Standards; Bioremediation; and Physio-chemical Remediation.
($ 14.723 million)

(U)Compliance (27 projects): The Compliance Thrust Area will continue efforts to support waste treatment and disposal, environmental monitoring and environmental management that is not directly related to site restoration but is meeting current and future environmental compliance requirements of DoD and DOE. Focus will be on and work on reduction of hazardous air emissions, fate and impact of contaminants, and characterization and treatment of contaminated waters and sludges.
($12.304 million)

(U)Conservation (17 projects): Work will continue in the assessment and mitigation of military impacts on DoD lands with an emphasis on range sustainability. Efforts will continue in addressing issues associated with threatened and endangered species and Ecosystem Management to develop the scientific understanding of ecosystem processes on military lands that will permit the continued use of these lands.
($10.488 million)

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(U) Unexploded Ordnance (UXO) Detection (11 projects): Continuing efforts to improve UXO detection capability, including the development of sensor technologies that exploit all of the physical characteristics of UXO. Equally important is the continued development of methods and techniques for accurately discriminating UXO from scrap in order to significantly reduce the cost of clearance.
($ 2.695 million)

(U) FY 2002 Plans:

(U)General: SERDP will continue research and technology efforts to address the high priority requirements in Pollution Prevention ; Cleanup; Compliance; Conservation; and unexploded ordnance (UXO). Particular attention is being directed to UXO and other issues which impact the sustainability of the Department's training and testing ranges. The increase in the FY 02 request will be directed towards the detection and discrimination of UXO as well as the multitude of issues concerned with the contamination of soil and groundwater due to energetic materials expended during live fire operations. In the Pollution Prevention thrust area: Five projects will come to completion. In addition to the ongoing projects, the new start focus areas for FY 2002 include: environmental fate, transport and effects of the new energetic material CL-20; environmentally benign polymer matrix composites; tagging technologies to permit the remote localization and identification of UXO; environmentally benign, low-temperature, powder coatings; environmentally benign packaging for military rations; environmentally acceptable pyrotechnics; technologies to prevent or limit marine fouling of ship hulls and heat exchangers; and environmentally acceptable replacements of fluorescent dyes for non-destructive testing of weapons systems. In addition, a major effort to develop "green" medium caliber ammunition will be begin. For the Compliance thrust area: In addition to the ongoing projects, five projects in compliance will complete. The areas of interest for new start projects include: determination of the emissions from live fire activities; source and ambient air toxic monitoring technologies; technologies to control aquatic non-indigenous species in Navy ships; and observation and prediction technologies for hazardous emissions from DoD operations. Within the Conservation thrust area: The new starts will focus on: techniques to cost effectively

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detect and evaluate cultural resources on DoD ranges; evaluation of the impact of fog oil "smoke generators" on the plants and animals on DoD ranges; techniques to assess the impact of land use changes (urbanization, encroachment) outside DoD installations on the installations' ecosystems; techniques to determine the impact of noise on animals; and the development of micro- and nano-scale sensors for ecosystem parameters. In addition, 4 projects will be completed. The Cleanup thrust area will have 11 projects completing. The focus of the new starts will include: technologies for remediation of soil and groundwater contaminated with energetic materials; developing a more complete understanding of the basic chemistry and physics of in-situ oxidation remediation methods; development of techniques to assess and predict the impact of source zone removal on the time and cost of total remediation; developing alternatives to expensive microcosm protocols for bioremediation; and development of technologies for cost effective long term monitoring. In the Unexploded Ordnance (UXO) area, there are 8 completing projects. The new start areas of interest include: developing technologies for the characterization and remediation of high density areas such aerial targets; new sensors, platforms or processing techniques for UXO detection in rugged or heavily vegetated terrain; new geolocation techniques and new render-safe or removal technologies. ($ 69.376 million)

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(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	57.207	51.357	53.346	Continuing
Appropriated Value		59.557		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.417	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.262	-0.133	0.000	
c. Other	0.000	0.000	16.030	
Current President's Budget	56.945	59.007	69.376	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding reductions are the result of below threshold reprogramming actions. FY 2001 reductions reflected Section 8086 adjustments and recissions. Increases in FY 2002 reflect amended budget changes for UXO efforts.

(U) Schedule: N/A

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(U) Technical:

(U) C. Other Program Funding Summary Cost N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3			R-1 ITEM NOMENCLATURE Joint Warfighting **PE 0603727D8Z**		
COST *(In Millions)*	FY 2000	FY 2001	FY 2002	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.634	7.538	7.613	Continuing	Continuing
Joint Warfighting/P727	7.634	7.538	7.613	Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT:

(U) In May 1998 the Secretary of Defense appointed Commander-in-Chief, United States Joint Forces Command (formerly the US Atlantic Command), as the Defense Department's Executive Agent for Joint Experimentation. Subsequently, the Department realigned resources to support the Joint Forces Command's new role. In FY 1999 funds from this Program Element were redirected to support the initial stand-up of Joint Forces Command's Joint Experimentation Directorate. Funding for joint experiments was transferred to Joint Forces Command through the Navy. Funding to support the Joint Advanced Warfighting Program concept development, the digital network infrastructure, and technology feeder support for joint experimentation was retained in this PE. Program Element 0603727N was established to provide Joint Forces Command with their own funding source in FY 2000.

(U) The Joint Warfighting PE supports three related activities: the Joint Advanced Warfighting Program (JAWP), the Information Technology Backplane (ITB), and technology feeder support for joint experimentation. While these activities strongly support Joint Forces Command's joint experimentation efforts, a separate program element has been retained since the activities support other organizations in addition to Joint Forces Command, and they require a degree of independence from Joint Forces Command to function as envisioned.

(U) The JAWP was established by the Office of the Secretary of Defense (OSD), with the support of the Vice Chairman of the Joint Chiefs, to serve as a catalyst for innovation and change. This program's focus is on assisting in the formulation and assessment of advanced concepts and capabilities, plus identifying enabling technologies and integration options for the Department. These concepts drive changes in the doctrine, organization, training and education, materiel, leadership and facilities (DOTMLF) of the Services. The JAWP serves a key role in identifying, exploring and evaluating breakthrough warfighting capabilities. It builds on the lessons learned from earlier Service experiments that have underscored the importance of having a firm conceptual basis upon which to build experiments. The JAWP concentrates on joint, vice Service-unique, revolutionary concepts. In identifying and elaborating innovative joint concepts and capabilities, and associated enabling technologies, the JAWP will not only take into account Service efforts, but those of CINCs and Defense agencies as well. The JAWP promotes integration, conducts experiments and assists in implementation. The JAWP's work complements and supports the activities of Joint Forces Command, the Joint Staff, and the OSD. It provides an independent source for formulating advanced concept candidates for joint experimentation. The JAWP is

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composed of both civilian analysts and technologists. The JAWP Analytical Project Office (JAWP-APO), a jointly manned activity established by the Deputy Secretary of Defense, consists of military personnel from the four Services. The civilians provide a level and quality of expertise not generally available in the Department of Defense. The active duty military members provide a current operational perspective to concepts under investigation and serve as a vital link to ongoing relevant activities in the Services.

(U) The Information Technology Backplane provides an advanced network infrastructure that extends commercial capabilities to provide capabilities needed to meet JV2020 needs. Information Superiority is a key JV2020 building block and the ITB provides the means to experiment with the digital transmission capabilities that will be available in five years. The ITB is not a new physical network. It is a virtual network that capitalizes on existing physical networks such as the Defense Information Systems Network (DISN), the Defense Information Systems Agency (DISA)-Defense Advanced Research Projects Agency (DARPA) Leading Edge Services Network (LESN), the Defense Research and Engineering Network (DREN), and the experimental Advanced Technology Demonstration (ATD) net. The ITB has many users from sites served by existing networks but the funding included in this PE is the incremental funding needed to support joint experimentation. For example, this PE provides the circuit costs to extend the ITB from the experimentation site to the nearest point on the backplane (where no other network exists), and only the "extra" backplane costs generated by the Joint Warfighting Experiments. Since joint experiments are very dependent on advanced distributed simulation, or on limited, live, command post exercises that are being driven by simulations, a robust network is needed to interconnect the various sites. These simulations press the state of the art in networking capability, including that of requiring Type-I encryption for protected communications. The ITB also supports new bandwidth intensive applications such as video teleconferencing and high definition television.

(U) The third effort supported by this PE is technology feeder support for joint experiments. There are many Technology Demonstrations (TDs), Advanced Technology Demonstrations (ATDs), and Advanced Concept Technology Demonstrations (ACTDs) that can provide advanced technologies to support joint experiments. For example, the Joint Staff has prepared 72 desired operational capabilities based on JV2010 concepts and 21st Century Challenges. For each Challenge, the Joint Staff has prepared roadmaps that provide opportunities to assess each Challenge. The roadmap for the battlefield awareness challenge shows 42 ACTDs that have the potential to demonstrate some aspect of a desired operational capability supporting battlefield awareness. This effort provides technology managers the resources to expand the scope of a test or demonstration to collect data for the joint staff or JFCOM, thereby leveraging the OSD and Service ACTD investment. The Technology Feeder Support effort is also being used to initiate a Red Team Pilot Project for Joint Forces Command. This Red Team will participate in Joint Forces Command Concept Development and Experimentation to provide an independent assessment that will ensure that product quality stays high and credible. A source of funding like this, which is separate from other Joint Forces Experimentation funding, will provide the necessary independence.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2000 Accomplishments:

(U) The Joint Advanced Warfighting Program (JAWP), working for the OSD, the Joint Staff, the Joint Forces Command and their subordinate activities in support of Joint Warfighting Experimentation: (1) identified key elements of a joint experimentation process; (2) developed candidate advanced concepts for joint experimentation including the Rapid Decisive Operations (RDO) concept which serves as the integrator for all JFCOM concepts; (3) developed a near-term Joint Strike Force concept that supports the evolution of the overarching RDO initiative; (4) assisted the Pacific Command (PACOM) in its development of a Joint Mission Force concept; (5) developed, organized and executed a follow-on experiment to Joint Forces Command's FY 1999 attack operations experiment (J9901) that captured experiences and lessons learned from the pursuit of time critical targets in Kosovo; (6) developed prototype experimentation plans; (7) conducted research and seminars to classify works on future operational concepts and future security environments that are relevant to joint experimentation; (8) assisted in the planning, design coordination and execution of Joint Forces Command's Millennium Challenge 00 experiment; (9) developed a framework and initial set of metrics to help gauge progress of warfighting transformation efforts for the Director, Joint Staff; (10) led an effort with the Joint Staff Urban Operations Working Group that looked at ways to improve capabilities to conduct operations in urban environments; (11) supported a Chairman, Joint Chiefs of Staff initiative to describe concepts of operations for future joint forces that elaborate on the objectives of JV2020; and (12) planned for and conducted seminars and workshops with other government organizations to identify complementary and supporting technology programs and activities. ($4.000 million)

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(U) The base ITB network connectivity was continued to the critical sites of JFCOM, TEC and NRL. Advanced engineering support from NRL was given to maintain the network functionality required by JFCOM experiments (Unified Vision 00 and Attack Ops 00). This included the monitoring and tuning of critical network performance parameters. In the area of network management, work on extending Kerberos authentication into Simple Network Management Protocol Version 3 (SNMPv3) and other protocols continued and were submitted to, and favorably received by, the Internet Engineering Task Force (IETF) as proposed standards. Interoperability with Public Key Infrastructure (PKI) protocols began. The testing of the advanced network features of Release 3 of the KG-75 FASTLANE continued. Issues which were identified were fed back to the vendor who incorporated them into software updates. Initial testing of the interoperable KG-175 TACLANE began. The results of these tests were fed back to NSA and the vendor for incorporation into released products. A Linux-based distributed network monitoring and test tool, ATM Network Test Software (ANTS), was developed for use in both the testing of network devices, as well as the monitoring of live, local and wide-area networks. This tool is now available in the public domain. An H.323 voice application has been extended to directly support native ATM clients with direct Quality-of-Service contracts. This application also interoperates with non-ATM connected clients. Efforts in support of JFCOM continued, focusing on assisting in the development of a local infrastructure to extend the ITB to multiple sites/users within JFCOM. ($1.400 million)

(U) The technology feeder support effort created an ACTD milestone document to track the status and life cycle phases of each ACTD. It will provide an effective planning tool to crosscheck future joint experimentation against planned ACTDs, event participation and military utility assessments. This effort also facilitated the integration of ten ACTDs into the primary FY 2000 joint experiment, MILLENIUM CHALLENGE 2000. These ACTDs are: Global Hawk, Battlefield Awareness and Data Dissemination (BADD), Extending the Littoral Battlespace (ELB), Integrated Collection Management (ICM), Military Operations in Urban Terrain (MOUT), Rapid Terrain Visualization (RTV), Joint Continuous Strike Environment (JCSE), Theater Precision Strike Operations (TPSO), Theater Air and Missile Defense Interoperability (TAMDI), and HUMINT CI Support Tools (HICIST). This activity also initiated an effort to introduce coalition involvement in joint experimentation. ($2.234 million)

(U) FY 2001 Plans:

(U) The Joint Advanced Warfighting Program (JAWP) will continue its support of JV2020 implementation and the Joint Experimentation work in the Office of the Secretary of Defense, the Joint Staff, and the Joint Forces Command and subordinate elements. Efforts will include both front-end identification and elaboration of concepts and capabilities, plus support for the conduct of experiments. The JAWP will continue to build on its FY 98 through FY 00 experiences with joint operational concept development and experimentation, focusing on enhancing joint operational-level command and control, enabling rapid expeditionary operations and refining the implementation process for lessons learned from joint experimentation. It will continue to mature and expand on the adaptive command and control

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(C2), plus intelligence, surveillance and reconnaissance (ISR), concepts developed during the Attack Operations experiments. It will leverage the experiences and lessons learned during Joint Forces Command's J9901 and Attack Operations 00 experiments, to include the investigation of innovative command and control applications and expanded, more robust sensor suites. It will continue to develop and refine candidate advanced warfighting concepts and capabilities using wargames, and modeling and simulation. It will identify promising and enabling technologies. It will collect and analyze data to support the formulation of the Department's overall Joint Experimentation efforts. Prior to that, however, it will develop a definition and an operational framework for effects-based operations. FY 01 experimentation will focus on laying the foundation for subsequent experimentation with Joint Forces Command on the Rapid Decisive Operations (RDO) concept in FY 02 through FY 04. The JAWP will continue to evaluate these concepts and systems through simulation, wargaming and analysis. It will conduct vulnerability assessments using "Red Teaming" techniques to identify weaknesses and avoid surprises. It will use the transparent wargaming approach, which it developed to assist in the conduct of the J9901 and other experiments. It will also complete its development of a DoD Roadmap for Urban Operations and continue its participation in the NATO Urban Working Group efforts. The JAWP will begin to identify programs, systems and methods to improve and expedite the process of executing and implementing the recommended changes, which result from the joint experimentation process and the development of new technological capabilities. Included in these latter activities, the JAWP will evaluate the systems and products developed in ACTDs for use in the Department's overall joint experimentation program. The JAWP will also seek and develop partnerships among related clusters of ACTDs, DARPA projects, Service Battle Labs, and JT&E activities to participate in related joint experimentation. ($4.500 million)

(U) The base ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, Unified Vision 01 will be supported and executed while Millennium Challenge 02 will be designed. Initial implementation of secure (Kerberized) network management protocols (SNMPv3) across selected ITB sites is expected. Development and evaluation of advanced security/information assurance devices and tools, such as ATM and host-based layered firewall technologies, will begin in the lab. Distributed applications, such as collaborative tools, will continue. Efforts in support of JFCOM will continue. Connectivity to key sites (JFCOM, TEC, etc.) will continue with selected circuits upgraded as required. Significant hardware upgrades to end-sites will occur. ($1.400 million)

(U) Experimentation Feeder Support: JFCOM's Campaign Plan 01 identifies 31 major exercises and experiments in FY 2001. The Deputy Under Secretary of Defense (Advanced Systems and Concepts), in coordination with JFCOM and the Joint Staff, will assist in determining which ACTDs, ATDs, and/or Technology Demonstrations best support JFCOM's experimentation events. This funding will be provided to the selected technology managers to support a joint experiment. Funding will be provided for efforts such as system integration, and logistics and test support. Planning and preparations will continue for incorporation of as many technology demonstrations as possible into the primary FY 2002 joint experiment, MILLENIUM CHALLENGE 2002. This will be initial year of funding the DOD Adaptive Red Team (DART) which will evaluate the major joint experiment of 2001 (Unified Vision 01) and prepare to observe and critique MILLENNIUM CHALLENGE 2002. ($1.638 million)

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(U) FY 2002 Plans:

(U) The JAWP will continue to build on its FY01 Joint Experimentation efforts, building toward FY 04 completion of the Rapid Decisive Operations (RDO) series of joint experiments. The JAWP will conduct human-in-the-loop simulation experiments of selected aspects of the Rapid Decisive Operations concept, including forcible entry operations, networking of ISR capabilities, and overcoming opponents' protective measures. Opportunities will be identified to leverage and integrate Service and other agency programs. Data collection and independent analysis will be conducted and used to produce reports and papers intended to inform the OSD, Joint Staff and the Joint Forces Command leadership of experimentation results and transformation choices. Vulnerability assessments and "Red Teaming" will be conducted to improve the validity and robustness of experimentation. The JAWP will work on the identification of and opportunities facilitating the early transition of new concepts and technologies into actual operational military capabilities. ($4.500 million)

(U) The base ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, Millennium Challenge 02 will be supported and executed. Final implementation of secure (Kerberized) network management protocols (SNMPv3) across the major ITB sites is expected. Information assurance and other security technologies will continue to be tested and deployed. Efforts in support of JFCOM will continue. Connectivity to key sites (JFCOM, TEC, etc.) will continue with selected circuits and equipment upgraded as required. ($1.400 million)

(U) Experimentation Feeder Support for Joint Experimentation will continue. JFCOM's Campaign Plan 01 projects 26 major exercise and experiments which can support technology demonstrations. The primary FY 2002 effort will be MILLENIUM CHALLENGE 02 and the technology feeder support effort will enable the incorporation of numerous technology demonstrations. Plans for OLYMPIC CHALLENGE 04 will be further defined and work will be begin to align the technologies supporting this major integrating exercise. Integrated concept teams will have had the opportunity to prepare more detailed experimentation and assessment plans. Once the concepts and experimentation plans are more clearly articulated, technologies supporting the experiments will be identified. This funding will leverage ongoing developments to support joint experiments, not to fund the development itself. The DOD Adaptive Red Team (DART) Pilot Project will initially be funded from within this project. Its primary of focus in FY 2002 will be to evaluate MILLENNIUM Challenge 2002. ($1.7 13 million)

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(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	7.675	7.607	7.570	Continuing
Appropriated Value	0.000	0.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	-0.041	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	-0.069	0.000	
c. Other	0.000	0.000	0.043	
President's Budget Submission	7.634	7.538	7.613	Continuing

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Change Summary Explanation:

(U) **Funding**: FY 2000 funding changes are due to reprogramming adjustments. FY 2001 reductions reflect Section 8086 adjustments.

(U) **Schedule**: N/A

(U) **Technical**: N/A

(U) **C.** **Other Program Funding Summary Cost**: N/A

(U) **D.** **Acquisition Strategy**: N/A

(U) **E.** **Schedule Profile**: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Agile Port Demonstration **PE 0603728D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	7.432	0.000						0.000	0.000
ADP/P728	0.000	7.432	0.000						0.000	0.000

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

The goal of the program is to support the development and deployment of advanced concepts and technologies leading to an automated, fully-integrated, multi-modal Defense Transportation System (DTS) able to meet the needs of the 21st century. The Center for Commercial Development of Transportation Technologies (CCDoTT) is a DoD funded consortium of public, private, and academic activities brought together to identify and deploy advanced technologies that can be systematically integrated into ports and other transportation systems supporting both commercial and DoD transportation requirements. The purpose of the program is to compare traditional transportation methodologies with next generation technologies, identify the potential for these new technologies to support DoD mobility requirements, and determine the scenarios and criteria for their economic use. All program activities are put forth in coordination with the Department of Transportation - Maritime Administration (MARAD).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Agile Port Demonstration **PE 0603728D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	7.432	0.000						0.000	0.000
ADP/P728	0.000	7.432	0.000						0.000	0.000

(U) Project Number and Title: P728 ADP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:
(U) None

(U) FY 2001 Plans:

(U) A cooperative research and development plan has been jointly developed by the DoD and MARAD that will focus projects on improving and leveraging Defense and commercial transportation system efficiencies by combining relevant capabilities, resources, and technologies in the following thrust areas; ports, terminals, transfer technologies; high speed sealift ship system configurations and; rapid deployment technologies. Research conducted under the interagency agreement will have clear links to national defense requirements addressed by DoD ($ 7.432 million).

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APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Agile Port Demonstration **PE 0603728D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000	0.000
Appropriated Value	0.000	7.500	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.068	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	0.000	0.000	0.000	
Current President's Budget	0.000	7.432	0.000	0.000

Change Summary Explanation.

(U) Funding: FY 2000 funding was reprogrammed to fund this effort per Congressional direction. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

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(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3							R-1 ITEM NOMENCLATURE Cooperative DoD/VA Medical Research Program **PE 0603738D8Z**			
COST *(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.674	.991	0.000						Continuing	Continuing
Coop DoD/VA Medical/P464	7.674	.991	0.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) Congress has added funding in this program element each year since 1987. Through FY 1998, the program was managed by the Veterans Administration. In accordance with the FY 1999 Defense Authorization Bill (H.R. 3616, Sec. 244), the Department of Defense now guides investment of these funds as executive agent, acting through the U.S. Army Medical Research and Materiel Command and the Naval Operational Medicine Institute. Coordination with the VA on research topics ensures that the program benefits the health of both active military forces and veterans. Research proposals are solicited from in-house DoD and VA investigators, and projects are selected for funding based on technical merit and relevance to the solicitation. Technical merit is determined through independent peer review by experts outside the DoD and VA. Projects are selected through independent peer review by intramural VA and DoD physicians and scientists. Funds support a `core` or general research program of cooperative medical research in topics such as emerging infectious diseases, trauma, stress, and exercise physiology. Funds also support studies on emerging medical issues of importance to DoD and VA.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Cooperative DoD/VA Medical Research Program **PE 0603738D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.674	.991	0.000						Continuing	Continuing
Coop DoD/VA Medical/P464	7.674	.991	0.000						Continuing	Continuing

(U) Project Number and Title: P464 Coop DoD/VA Medical

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) The Department of Defense continued an investment strategy and execution plan developed to comply with the FY 1999 Defense Authorization Bill (H.R. 3616, Sec. 244). That bill named the Secretary of Defense as executive agent, acting through the Army Medical Research and Materiel Command (USAMRMC) and the Naval Operational Medicine Institute (NOMI). In FY 2000, USAMRMC supported proposals for research in muscle repair mechanisms and prostheses, medical records transitioning, emerging pathogens, women`s health, and sleep disorders. NOMI solicited proposals for research on selecting and training personnel for occupations with a high risk of capture, improving the repatriation process, supporting the families of POWs during the period of captivity and supporting both the POWs and their families after repatriation, diagnosing and treating illnesses and disorders, compensating POWs for disabilities for long-term conditions arising from their captivity, and understanding the nature and determinants of physical and mental health outcomes of POWs. Awards to successful proposals began in 3Q FY 2000.
($ 7.674 million)

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APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Cooperative DoD/VA Medical Research Program **PE 0603738D8Z**

(U) FY 2001 Plans:

(U) In the FY 2001 research program, $0.500 million will be focused on "Occupational Lung Disease/Review of Biopsies" as provided by Congress. With the remaining funds, the Departments of Defense and Veterans' Affairs have agreed to focus on post-traumatic stress disorder (PTSD), which has been found to affect deployed personnel while still on active duty or after they leave military service. Research efforts will address symptoms and health outcomes, etiology and contributing factors, effective preventive measures, and possible treatments. ($ .989 million)

(U) B. Program Change Summary	FY 2000	FY 2001	FY 2002	Total Cost
Previous Budget Submit	7.415	0.000	0.000	Continuing
Appropriated Value		1.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.009	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.259	0.000	0.000	
c. Other	0.000	0.000	0.000	
President's Budget Submission	7.674	.991	0.000	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3	**R-1 ITEM NOMENCLATURE** Cooperative DoD/VA Medical Research Program **PE 0603738D8Z**

Change Summary Explanation

(U) Funding: Funding changes are the result of a below treshhold reprogramming. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

(U) C. Other Program Funding Summary Cost N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/BA 3		**R-1 ITEM NOMENCLATURE** Advanced Concept Technology Demonstrations PE 0603750D8Z			
COST *(In Millions)*	FY2000	FY2001	FY2002	Cost to Complete	Total Cost
Total Program Element (PE) Cost	104.384	118.744	148.917	Continuing	Continuing
ACTDs/P523	104.384	118.744	148.917	Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT: The Department of Defense (DoD) recognizes the need to rapidly develop and field new technological capabilities, and to explore new and innovative operational and organizational concepts associated with those capabilities. Such advances are critical to the objective of supporting the Chairman's *Joint Vision 2020*. Advanced Concept Technology Demonstrations (ACTDs) are low risk vehicles for pursuing that objective. ACTDs are capability demonstration and evaluation programs in which the development and employment of technology and innovative, operational concepts by the military user are the primary focus. The demonstrations involve a material development organization that develops the technology, and a warfighting sponsor that assesses the military utility. In addition to stimulating innovation, ACTDs offer three other significant opportunities. They provide experienced combat commanders with an opportunity to develop operational concepts and operational requirements to fully exploit the capabilities being evaluated. They allow the users an opportunity to assess the military utility of the proposed capability prior to a major acquisition decision. They also provide the Services with a mechanism for compressing acquisition cycle time, thus significantly improving their response to priority operational needs. As such, ACTDs are at the foundation of the DoD acquisition reform process. They do not substitute for formal DoD acquisition procedures, but do accelerate these procedures for technologies which are deemed by the applicable combatant commands to have demonstrated military utility. Since FY 1999, ACTDs have been an integral part of the Joint Experimentation process under U.S. Joint Forces Command (JFCOM). The Deputy Under Secretary of Defense (Advance Systems and Concepts) (DUSD (AS&C)) works closely with JFCOM to prepare its annual Campaign Plans in order to insure ACTDs integrate technology and develop new concepts of operation to fully leverage with and integrate into future joint experiments.

(U) The Military Departments and Defense Agencies provide most of the funding (80–90 percent) for ACTDs. This demonstrates significant Service/Agency commitment to the ACTD. Funding from this program element is used: 1) to support actual demonstrations and exercises, 2) to provide hardware to demonstrate military utility, and 3) to fund transition, interim capability operations and support for up to two years after the operational demonstration phase of the ACTD. This two-year phase provides the Service, Agency, and operators with adequate time to continue to address the issues of supportability, maintainability and training identified by the ACTD.

(U) Both the Science and Technology (S&T) and the warfighter communities submit candidate ACTDs in January of each year. The candidates proposed by the S&T community reflect technological opportunities enabled by recently demonstrated technology. The candidates proposed by the warfighter

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community (Joint Chiefs of Staff (JCS), Unified Commanders in Chief (CINCs) and Service operational organizations) respond to a deficiency in military capability or to an emerging military need. For each candidate, it is necessary to confirm that the proposed concept is based on technology that is sufficiently mature, and that the capability addresses a priority military need.

(U) The maturity of the technology associated with the proposed capability is assessed by the DUSD (AS&C), with assistance of senior members of the science and technology community (known as the Breakfast Club). The Joint Requirements Oversight Council (JROC) prioritizes the ACTD candidates by military need. The principal management tools for the ACTD are the Implementation Directive and Management Plan. Each approved ACTD will be described in these top-level documents which provide details of the demonstration/evaluation, the main objectives, approach, critical events, measures of success, transition options, participants, schedule, and funding.

(U) The typical timeline of two-to-four years for the operational demonstration phase of an ACTD is compressed compared to normal timelines for fielding an operational capability. These shorter schedules are made possible because ACTDs incorporate mature or nearly mature technology and, therefore, forgo time consuming technology development and technical risk reduction activities. At the end of the ACTD, the user sponsor is able to determine if the capability provided by current technology has sufficient utility to warrant procurement. If there are significant shortcomings, their options are to either pursue an advanced technology demonstration to improve performance, or not pursue the technology any further at this time. In cases where the operational user is satisfied the prototype has significant utility, the prototype can be used as an interim capability. The Department then moves quickly to enter the formal acquisition process to acquire needed quantities or, if sufficient, to make fully operational those assets already produced.

(U) The request for FY 2002 candidate ACTDs was issued October 2000. Proposals were received from the CINCs, Services, other DoD Agencies, and industry in January 2001. Candidates are organized into the *Joint Vision 2020* operational concepts of Dominant Maneuver, Precision Engagement, Full Dimensional Protection and Focused Logistics. Review of the candidates for FY 2002 ACTDs began in February 2001. As an initiative in FY 2002, the Department intends to begin a larger number of ACTDs, provide s higher percentage of OSD funding for these new ACTDs and provide additional funding for expanded user evaluations (EUEs) at the conclusion of successful ACTDs. This additional EUE funding will also facilitate enhanced program transition. Funding for new FY 2002 ACTDs is approximately $30 million.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) **FY 2000 Accomplishments**: All ongoing ACTDs initiated in Fiscal Years 1995 through 2000 have been reviewed for objectives, content and management. This includes in-depth review by the ACTD operational sponsors, such as United States Joint Forces Command (JFCOM). Of the approximately 20% of all ACTDs deployed, or requested for deployment, to Operation Allied Force, some remained in theater as part of Kosovo peacekeeping operations. Twelve new ACTDs were started in FY 2000: CINC 21, Coalition Aerial Surveillance and Reconnaissance, Communications/Navigation Outage Forecast System, Computerized Operational MASINT Weather, Content-Based Information Security, Global Monitoring of Intelligence, Surveillance and Reconnaissance Space Systems, Ground-to-Air Passive Surveillance, Joint Intelligence, Surveillance and Reconnaissance, Multiple Link Antenna System, Quick Bolt, Restoration of Operations and Tri-Band Antenna Signal Combiner. The data call for FY 2001 ACTDs began in October 1999. Twenty-five final ACTD candidates, of the fifty received from the Unified Commands, the Services and Defense agencies, were considered for final selection. Candidates covered a broad range of technologies and needs, including logistics, intelligence, reconnaissance, surveillance, life support, information technology, automated maintenance, ordinance upgrade, communications and force identification. These candidates were evaluated for technical maturity by the Breakfast Club and assessed for operational need and utility by the Joint Staff Joint Warfare Capability Assessment (JWCA) process. The JROC then prioritized these 25 candidates and fifteen were finally selected based upon funding availability. FY 2000 funds were transferred to the executing services/agencies in the amount of $104.384 million.

(U) FY 2000 accomplishments include:

FY 1995 Starts:

- High Altitude Endurance Unmanned Aerial Vehicle (HAE UAV): Completed the operational demonstrations and military utility assessment. Concluded the interim capability period to end the ACTD.
- Joint Countermine (JCM): Completed the integration of the Joint Countermine Application (JCA) to run under all current service command, control, communications and intelligence architectures. Concluded the interim capability support period to end the ACTD.
- Precision SIGINT Targeting System (PSTS): Continued the interim capability support period.
- Rapid Force Projection Initiative (RFPI): Concluded the interim capability support period to end the ACTD.

FY 1996 Starts:

- Air Base/Port Biological Detection: Continued interim capability and residual maintenance of detector networks. P rovided depot repairs and spares. Initiated upgrade of sampling system and maintained ongoing operator training at four sites in two theaters.
- Battlefield Awareness and Data Dissemination (BADD): Fielded BADD products to selected CINCs. Continued upgrading capability, based on warfighter input/feedback, to provide a more enhanced version to the CINC's in the latter part of the fiscal year. Concluded interim capability period and ended the ACTD. Transitioned capability to the Defense Information Services Agency (DISA) for operations and maintenance support.

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- Combat Identification (CID): Supported interim capability assets for the final year of continued operation and obtained additional user feedback on military utility and maintainability. Continued operational support provided a mechanism from which critical features for continued development of "combat identification" technologies emerged. Concluded interim capability period to end the ACTD.
- Counterproliferation I (CP I): Supported residuals for further operational feedback to assist system engineering, integration and production activities. Continued to support exercises and concept of operations (CONOPS) development for U.S. European Command (USEUCOM), incorporating experience gained by deployment of CP residuals for Kosovo. Completed interim capability period to end the ACTD.
- Joint Logistics: Joint Decision Support Tools (JDSTs) were hardened and evaluated in a February 2000 military utility demonstration. Four of the five JDSTs were recommended for transition to Global Communications Support System (GCSS) from a user perspective. All products were segmented for transition to DISA GCSS and have been maintained as an interim capability. DISA D6 has accepted the products for transition and integration.
- Miniature Air Launched Decoy (MALD): Continued the interim capability period, enhanced design for reliability and completed the military utility assessment.
- Navigation Warfare: Continued interim capability period. Residual equipment was utilized in support of the Joint Global Positioning System Combat Effectiveness (JGPSCE) joint test and evaluation.
- Semi-Automated IMINT Processing (SAIP): Supported the Army vehicle version and the Air Force rack version of the SAIP residuals. SAIP was used in the U.S. Central Command (USCENTCOM) Joint Intelligence Center (JIC) and was deployed to theater. Revised the CONOPS and finalized transition plans. Concluded the interim capability period and ended the ACTD.
- Theater High Energy Laser (THEL): Laser system constructed at White Sands Missile Range early in the fiscal year, followed by system integration and functional testing. Various sub-systems tests conducted during December 1999 - May 2000. In June 2000, fully integrated laser system successfully shot down a Katyusha rocket and, in August 2000, successfully engaged a multiple-rocket salvo.

FY 1997 Starts

- Chemical Add-On to Air Base/Port Bio Detection: Concluded interim capability and residual maintenance, training and field support at four sites in two theaters. Ended the ACTD.
- Counterproliferation II (CP II): Completed a series of successful operational tests and the PDR on the nose assembly of the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) Bomb Impact Assessment (BIA) Modification. Continued engineering and manufacturing development (EMD) work on the Navy's aircraft-launched BLU-116 Advanced Unitary Penetrator (AUP) and the multi-Service FMU-159 Hard Target Smart Fuze (HTSF) for optimizing detonation location in multi-layered hardened targets. Continued development and integration of the Tactical Tomahawk Penetrator Variant (TTPV) penetrating standoff cruise missile. Continued work on Enhanced Payloads for targeting biological agents. Continued preparations for FY01 operational demonstrations.
- Extending the Littoral Battlespace (ELB): Refined Major System Demonstration I (MSD I) architecture and technology enhancements. Participated in two limited objective experiments (LOEs) with operating forces in preparation for MSD II in FY 2001.
- Information Operations Planning Tools (IOPT): Completed interface to Mission Integration Database (MIDB) 2.0 and enhanced Dynamic Integrated Air

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Defense System (IADS) model. User evaluation and training continued during JEFX 00. Provided sustainment and support of IOPT to CENTCOM, Central Air Forces (CENTAF) and a number of other locations.

- Integrated Collection Management (ICM): Developed operations and intelligence, surveillance and reconnaissance synchronization matrix and automated interfaces to collection platforms and data sources. Improved reengineered integration collection management processes. Connected collection management nodes for collaboration. Continued transition planning and conducted a field testing and military utility assessment as part of the Special Project-99 exercise run by U.S. Southern Command (USSOUTHCOM) and the Joint Expeditionary Force Exercise sponsored by the U.S. Air Force.
- Joint Advanced Helicopter Usage and Monitoring System (JAHUMS): Installed baseline system and sensors on H-60 flight test aircraft and conducted developmental testing. Technology module critical design reviews conducted. Began hardware/software builds in preparation for bench testing. Developed health and usage monitoring system cost/benefit model and began data collection.
- Military Operations in Urban Terrain (MOUT): Completed systems integration assessments and refinements. Acquired products and prototypes for the culminating demonstration (CD) and for interim operational capability. Completed New Equipment Training (NET) for the CD. Conducted Situation Awareness/Communications Excursion. Conducted Advanced Concept Excursion. Conducted the MOUT Culminating Demonstration. Completed several operational/training (e.g., tactics, techniques and procedures (TTP) handbooks) and programmatic transitions.
- Rapid Terrain Visualization (RTV): Acquired high-resolution digital elevation data and satellite imagery in support of Warfighter Exercises. Exploited multi-spectral and radar imagery to accelerate terrain feature extraction. Upgraded workstations and software at Army XVIII & III Corps. Completed installation of Light Detection and Ranging (LIDAR) & Infrared Synthetic Aperture Radar (IFSAR). Demonstrated capabilities for rapid data generation. Completed transition memorandum of understanding (MOU) with Combat Terrain Information Systems.

FY 1998 Starts:

- Adaptive Course of Action (ACOA): Installed baseline system and sensors on H-60 flight-test aircraft and conducted developmental testing. Technology module critical design reviews conducted. Began hardware/software builds in preparation for bench testing. Developed health and usage monitoring system cost/benefit model and began data collection.
- C4I for Coalition Warfare (C4ICW): Mission Control System Block III software and hardware was successfully used in a coalition command post exercise that demonstrated interoperability between Command and Control Systems/prototypes from Canada, Germany, Italy, the Netherlands and Spain using an agreed data model and data replication mechanism.
- Information Assurance: Automated Intrusion Detection Environment (IA:AIDE): Selection of additional sites were conducted based on a representative model of the Defense Information Infrastructure (DII). Surveys for the new sites were conducted and new sensors were identified which will be integrated into the AIDE environment. Sensor data and data correlation were fine tuned to reduce false alarm rates. Hardware and software upgrades for all the ACTD sites were purchased and installed. All additional installations and training were completed. Initiated final reports documenting the ACTD. A final demonstration of the system was conducted.
- Joint Biological Remote Early Warning System (JBREWS): Continued field tests of ACTD components at Dugway Proving Grounds. Commenced initial provision of residual assets (Sentry, Sample Identification, and Sensor Network Command Post Units) to USEUCOM. Continued CONOPS development

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and training.

- Joint Continuous Strike Environment (JCSE): Conducted military utility assessment in Fleet Battle Experiment Foxtrot and simulation-driven lab test. Completed third of four functional software builds. Continued concept of operations refinement and transition planning. JCSE was also used in JFCOM J-9 attack operation experiments.
- Joint Modular Lighter System (JMLS): Completed fabrication of powered and non-powered eight foot-wide modules and ancillary hardware and delivered hardware to Naval Amphibious Base Little Creek. Contractor conducted test and demonstration (T&D) program including sea trials of powered subsystems. T&D program included technical testing of JMLS hardware, supported by Government furnished equipment. Technical testing addressed system performance and interface issues. Following completion of the contract, the government corrected reliability and safety discrepancies identified during T&D. Government conducted test and evaluation (T&E) program to obtain Army safety releases prior to military personnel operating the craft in Sea State 3 (SS3) and to support a military utility assessment scheduled for 2ndQ FY01. Safety releases were obtained for several subsystem capabilities. However, the Army and Navy decided to pursue fielding a wider 24-foot module instead of the current eight foot-wide module. Commenced interim capability support period.
- Line-of-Sight Anti-Tank (LOSAT): Continued fire unit and missile detail-level design and analysis. Hardware tooling design and fabrication begun. Initiated fire unit and missile piece part hardware fabrication to support launch effects tests. Completed fire unit operational and test software design. Initiated code development and test. Completed update of missile operational software requirements and initiated software update. Completed hardware-in-the-loop and closed-loop simulation software upgrades.
- Link-16: Continued operational support to the Combine Air Operations Center (CAOC) in Kosovo. Continued development of DoD Joint Data Network (JDN) multi-tactical digital information link (TADIL) (Link 11 and Link 16) translation and data forward efforts. Successfully completed Joint Variable Message Format (JVMF)/Link 16 Joint Service Certification. Successfully transitioned Rosetta technology to USAF Tactical Air Control Party (TACP) Acquisition program. Continued integration efforts with Precision Targeting Identification ACTD.
- Migration Defense Intelligence Threat Data System (MDITDS): Infrastructure Enhancements included integration of Generic Message Browser, Crisis Case, Counterintelligence Applications, and Global Query. The Tactical Server hardware was deployed to theater, and the requirement definition for reengineering was completed.
- Precision Targeting Identification (PTI): Deployed the production Advanced Target Detection system in the fleet. Transitioned the re-configurable optical station (part of the C-130 OSSCAR Roll-on/Roll-off (RO/RO)) into an acquisition program for Naval Intelligence. Initiated prototype C-130 OSSCAR RO/RO C4ISR deployment system design. Integration design of the Rosetta Communication Gateway with the PTI track correlation processor was completed. Completed design and fabrication of the PTI telescope system. Completed Laser Radar (LADAR) Level II design package for the Tornado fighter aircraft. Completed lab evaluation of the PTI LADAR system. Initiated multi-year cooperative program with Ministry of Defense, United Kingdom on integration test and evaluation of the fighter-based LADAR for target identification.
- Space Based Space Surveillance Operations (SBSSO): Concluded formal demonstration and completed transition plan for contributing sensor operations for the Space Surveillance Network (SSN) to Air Force Space Command. The SBSSO has discovered or recovered over 100 lost, maneuvered, new or previously uncatalogued objects. Current capability totals over 1,000 observations per day, and can search the geosynchronous belt portion of deep space

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in three and one half hours of observations taken over a twenty-four hour period.

- Theater Precision Strike Operations (TPSO): Conducted the unreinforced scenario assessment, the second of three user demonstrations in conjunction with the U.S. Forces Korea Ulchi Focus Lens Exercise.
- Unattended Ground Sensors (UGS): Commenced interim capability period. Initiated transition to acquisition program. Refurbished sensors for use in exercises and operations. Performed additional communications development.

FY 1999 Starts:

- Battle Damage Assessment (BDA) in Joint Targeting Toolbox (BDA in JTT): Developed requirements and the operational concept. Conducted a demonstration at USCENTCOM of prototype software screen designs, including some interactive capability.
- Coherent Analytical Computing Environment (CACE): Decreased information latency of aircraft maintenance reports through implementation of a data warehouse with live feeds of maintenance data and a user-familiar interface. Completed extended collection of aircraft flight data sets, and prototyped tools for aircraft performance analysis and for cross-correlation of flight parameters with aircraft maintenance records. Demonstrated agent-based flight scheduling software for real-time re-planning and forecasting.
- Common Spectral MASINT Exploitation Capability (COSMEC): Demonstrated the utility of spectral data with operational assets. COSMEC ground station was implemented in USEUCOM, as well as the support of tactical airborne sensors. Released software version 1.3.2. Implemented system at USSOUTHCOM and conducted a demonstration at USEUCOM.
- Compact Environment Anomaly Sensor II (CEASE II): Completed system integration on critical satellite systems and conducted system launch.
- Force Medical Protection/ Dosimeter (FMP/D): Conducted technical evaluation of Phase II sampler. Conducted utility assessment at the CINC level.
- Human Intelligence (HUMINT) and Counterintelligence (CI) Support Tools (HICIST): Conducted military utility assessments in three exercises to evaluate technologies for special operations forces, human intelligence, and counterintelligence applications. HUMINT Analytic Support Cell achieved interim operational capability and text translation technology was provided to Bosnia.
- Joint Medical Operations - Telemedicine (JMO-T): Telemedicine (JMO-T): Assessed options for standard tactics, techniques, and procedures for JMO-T employment forward of the theater hospital. Demonstrated JMO-T capabilities to provide medical information in a net-centric environment across a wide variety of communication modes; assessed the utility of JMO-T technologies in improving the timeliness, quality and applicability of information in medical decision making; initiated preparations for leave behind/residual period.
- Joint Theater Logistics (JTL): Preliminary development focused on collaboration, visualization, and logistics user management processes. User requirements were developed and refined, with a complimentary program design. Commenced a business process review to model the use of JTL capabilities in the warfighter environment. Worked the incorporation of collaboration products from Adaptive Courses of Action ACTD.
- Personnel Recovery Mission Software (PRMS): Conducted system integration and fielding. Participated in the PACOM Northern Edge exercise. Completed development of three prototypes for assessment by user community. Continued software refinements based on user requirements. Conducted CENTCOM integration.
- Small Unit Logistics (SUL): Deployed the web-based system in the Combined Arms Exercise (CAX) and Marine Expeditionary Force Exercise (MEFEX)

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showing interoperability with legacy command and control (C2) personal computer systems and demonstrated decision support tools for supportability of missions. Assessed performance of tactical-level C2 with a web-enabled battlefield, including technical characterization of bandwidth measurements, as well as operational performance measures against the Joint Universal Task List.

- Theater Air and Missile Defense Interoperability (TAMDI): Demonstrated the ability to pass target track information to a PATRIOT weapons system to initiate an intercept (launch weapon) in advance of the PATRIOT radar detecting and tracking the target.

FY 2000 Starts:

- CINC 21: Implemented cooperative knowledge wall and data interoperability effort between U.S. Strategic Command (USSTRATCOM) and U.S. Pacific Command (USPACOM). Demonstrated high resolution multiframe presentations of logistics situation and battle rhythm. Assessed critical decision points, processes and information requirements. Supported assessment of collaboration tools over secure networks. Initiated joint coalition efforts with UK, Canada and Australia on interoperable knowledge sharing.
- Coalition Aerial Surveillance and Reconnaissance (CAESAR): Participated in the Clean Hunter/Joint Project Optic Windmill exercise at five locations in theater. CAESAR assets were employed in both simulated (Joint STARs, Global Hawk, UK ASTOR, and Italian CRESO) and live (French Horizon, P3 APY-6) exercises. Exercise provided baseline for CAESAR technology and CONOPS. Negotiated seven-country memorandum of understanding.
- Communication/Navigation Outage Forecasting System (C/NOFS): Confirmed launch opportunities for space-based package. Began fabrication process of space-based sensor.
- Computerized Operational MASINT Weather (COMWx): Developed and validated algorithms for providing near-real-time cloud/aerosol products for high-value targeting support utilizing existing National assets. Planned a foundation to exploit future systems and increase battlespace situation awareness to support use of precision guided munitions, strike warfare, fleet defense, air refueling and reconnaissance. Investigated future sensor requirements.
- Content-Based Information Security (CBIS): Awarded contract for Phase I (Data-in-Transit) development of the security card; the core element of CBIS technology providing embedded encryption for the workstation. Demonstrated the CBIS concept of coalition interoperability during the Millennium Challenge exercise.
- Ground-to-Air Passive Surveillance (GAPS): Conducted Caribbean assessment for availability of illumination and CONOPS analysis. Completed and validated simulation and modeling tools for use in other theater scenarios. An integrated process team (IPT), including the users, defined and modeled operational scenarios using a suite of tools available from industry. Models and simulation were used to ensure that the operational concepts and the resulting system specifications were understood prior to system integration.
- Global Monitoring of ISR Space Systems (GMSIS): Initiated the ACTD.
- Joint Intelligence, Surveillance and Reconnaissance (JISR): Defined initial user requirements and operational functionality. Designed system architecture and virtual demonstrations. Identified and evaluated candidate technologies and software. Built initial modeling and simulation capability.
- Multiple Link Antenna System (MLAS): Completed initial radio frequency (RF) component design and fabrication. Conducted component lab tests and confirmed
component capability to simultaneously maintain four full-duplex high data rate links. Confirmed component compatibility with common data link (CDL)

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format and capability to transmit and receive all CDL data rates within the frequency management parameters. Initiated systems engineering efforts leading to antenna configuration demonstrations and field tests.

- Quick Bolt: Established Integrated Product Teams. Prepared a functional requirements document (FRD) which will become the basis for an operational requirements document. Awarded a contract to review the FRD and begin system design work.
- Restoration of Operations (RestOps): Completed development of site baseline exercise scenario. Conducted Joint Chemical Field Trials and CONOPS development and validation. Developed methodologies to assess technology, chemical field trials, and operational capability for use during RestOps and other fixed-site programs.
- Tri-Band Antenna Signal Combiner (TASC): Integrated tri-band antenna signal combiner from existing hardware and designs. Began development of associated mission planning software to maximize data throughput, while minimizing antenna weight and volume.

(U) **FY 2001 Plans:** Transition those ACTDs that have successfully demonstrated military utility and been determined to warrant acquisition. Continue development and operational demonstration of the remaining FY 1996-2000 ACTDs, and start new FY 2001 ACTDs in accordance with planned schedules. Continue the annual process of developing and structuring new candidate ACTDs to rapidly address user needs and address issues identified in *Joint Vision 2020*. Several ACTDs will remain deployed in the Kosovo theater as part of ongoing peacekeeping operations. Funding will continue for all ongoing ACTDs, including the new FY 2001 ACTDs, for a total of $118.744 million.

(U) Other significant plans for FY 2001 are:

FY 1995 Starts:

- Precision SIGINT Targeting System: Conclude the interim capability support period and end the ACTD.

FY 1996 Starts:

- Airbase/Port Biological Detection System: Continue residual maintenance of detector networks, provide depot repairs and spares, initiate upgrade of sampling system and maintain ongoing operator training at four sites in two theaters. Provide data and findings for EMD of ACTD elements. Continue the interim capability period.
- Joint Logistics: Transition product to GCSS through the Advanced Information Technology Services (AITS) Joint Program Office (JPO) within the Defense Information Systems Agency (DISA). Conclude interim capability period and end the ACTD.
- Miniature Air-Launched Decoy: Conclude the interim capability period and end the ACTD.
- Navigation Warfare: Conclude the interim capability period and end the ACTD.
- Theater High Energy Laser: Commence the interim capability support period.

FY 1997 Starts

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- Counterproliferation II: Complete the BIA system critical design review (CDR) and final RDT&E, including demonstrating key performance parameters necessary to qualify for production. Complete final RDT&E sled testing necessary to qualify the BLU-116 Advanced Unitary Penetrator (AUP) for production. Complete Hard Target Smart Fuse (HTSF) EMD. Continue RDT&E of Tactical Tomahawk Penetrator Variant (TTPV). Conduct sled tests to demonstrate penetration capability and demonstrate effectiveness of a statically-emplaced TTPV warhead against hardened, cut-and-cover facility. Execute Joint Air-to-Surface Standoff Missile (JASSM) developmental test against above-ground simulated biological weapons facility and obtain collateral effects data. Continue RDT&E on enhanced payloads.
- Extending the Littoral Battlespace: Conduct MSD II, followed by the military utility assessment. De-install partial ELB configuration from the amphibious reconnaissance group (ARG). Continue residual planning and transition planning efforts with Navy/USMC acquisition programs.
- Information Operations Planning Tool: Continue residual support and finalize transition plans. IOPT supported CENTCOM and CENTAF in INTERNAL LOOK 2001. Provide IOPT capability to other IO-related programs in various services. Conclude the interim capability period and end the ACTD.
- Integrated Collection Management: Develop additional interfaces to collection platforms, collection nodes and data sources. Further enhance and refine software. Develop systems integration and enhancements to processes in response to user feedback. Conduct military utility assessment demonstrations, deliver residual interim capability to JFCOM and begin transition of technology for acquisition.
- Joint Advanced Health and Usage Monitoring System: Conduct bench-level integration testing of technology modules. Install technology modules on JAHUMS flight test aircraft. Provide aircrew training and install system at operational squadron. Begin the operational demonstration.
- Military Operations in Urban Terrain: Refurbish CD equipment and commence interim capability/extended user evaluation (EUE) period. Provide user evaluation information to appropriate combat and materiel development communities. Extend experimentation phase, focusing on partially met requirements, and undertake other key MOUT activities.
- Rapid Terrain Visualization: Complete integration and testing of high-resolution elevation data collection sensors. Complete final version of rapid terrain, data-generation software (Build 5.0). Acquire and process data over CONUS sites and the Republic of Korea. Install Build 5.0 software at XVIII and III Corps. Extend capabilities to units in Germany and Hawaii, and NIMA. Complete transition plan for operation of RTV sensors / aircraft. Initiate effort to transition sensors to UAV platform. End the ACTD.

FY 1998 Starts:

- Adaptive Course of Action: Continue multiple CINC, coalition and interagency-level software integration. Demonstrate military utility of the complete ACOA system during a joint exercise in the December 2000 time frame. Complete integration, hardening and transition into GCCS with delivery of the final version of ACOA. Delivered system will include improved versions of Web Planner, Odyssey, the Campaign Object server, Geospatial Force Planning Tool, Virtual Books, Intelligent Process Management, and Facilitate.com. Begin interim capability support phase.
- C4I for Coalition Warfare: Conduct a major demonstration, involving the United States (Maneuver Control System Block IV), United Kingdom, France, Germany, Italy and Canada, of the coalition interoperability gained with ACTD message formatting and database replication. This will be in the form of a field exercise. The developed capability will be fully integrated into the Maneuver Control System (MCS) for initial fielding during FYs 2001/2002. A decision will be made on the wider integration of capability into other Army Battle Command System (ABCS) components.

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- Information Assurance: Automated Intrusion Detection Environment: Upgrades for new versions of existing sensors and all software licensing and hardware maintenance will be installed and maintained. Additional correlation, visualization, and data mining tools will be enhanced and matured. CONOPS will be validated for the Initial Operational Capability. Transition planning will begin.
- Joint Biological Remote Early Warning System: Provide remote detection and warning of biological agents for a brigade-size assembly area to be installed and supported in theater. Conclude the interim capability support period to end the ACTD.
- Joint Continuous Strike Environment: Conduct Military Utility Assessments in Fleet Battle Experiment India and Korean exercises. Complete software build four and begin DII-COE compliance testing. Conduct simulation driven stress and interface test.
- Joint Modular Lighter System: Conclude interim capability support period to end the ACTD.
- Line-of-Sight Anti-Tank: Complete two early risk reduction missile flight tests utilizing residual inertial measurement unit (IMU) and guidance electronics hardware from earlier verification tests and a fire unit structurally representative of the final design. Complete design changes to fire unit and missile assembly designs as a result of the operational requirements document (ORD) and prepare for final program design review. Complete tool design and fabrication. Update software requirement analyses and begin detail design updates to incorporate software modifications to reflect ORD updated requirements.
- Link-16: Continue operational support to the Combine Air Operations Center (CAOC) in Kosovo. Complete development of DoD Joint Data Network (JDN) multi-TADIL (Link 11 and Link 16) translation and data forward efforts. Plan to conduct a Joint Service Certification of the Rosetta multi-TADIL (Link 11/Link 16) functionality in third quarter Fiscal Year. Plan to conduct a Joint Service Certification of the Rosetta Link 16/JVMF Version 3.3.3. Successfully transitioned Rosetta technology to United States Joint Service Acquisition program in fourth quarter Fiscal Year 2001. Plan to complete integration efforts with Precision Targeting ID ACTD, and conduct a demonstration in fourth quarter Fiscal Year 2001. Plan commencement of Rosetta technology into the Loitering Electronic Warfare Killer (LEWK) ACTD as the communications node for the tactical UAV payload.
- Migration Defense Intelligence Threat Data System: Complete interface of MDITDS and Joint Risk Assessment Management Program (JRAMP) and evaluate it and the deployable server. Conduct a Beta II/ Force Protection Demonstration in conjunction with a field training exercise.
- Precision Target Identification: Conduct laboratory aircraft test and operational deployment of the complete PTI system. Conduct flight evaluation of the PTI LADAR system. Complete multi-year cooperation agreement with Ministry of Defense, UK for fighter-based LADAR. Complete prototype system design for the re-configurable optical station. End the ACTD.
- Space Based Space Surveillance Operations (SBSSO): Conclude interim capability period and end the ACTD. Initiate post-SBSSO ACTD dedicated sensor operations to Air Force Space Command. Transfer the space asset (MSX) from the Ballistic Missile Defense Organization (BMDO) to U.S. Space Command (USSPACECOM).
- Theater Precision Strike Operations (TPSO): Conduct the Transition-to-Reinforcement assessment, the third in series of user demonstrations/evaluations.
- Unattended Ground Sensor (UGS): Complete transition to acquisition. Conclude interim capability period and end the ACTD.

FY 1999 Starts:

- Battle Damage Assessment in Joint Targeting Toolbox: Develop software architectural “backbone” with limited ground force models/algorithms.

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Integrate BDA software into JTT version 3. Conduct initial USCENTCOM functional review and capability demonstration.

- Coherent Analytical Computing Environment: Provide flight operations planning and automated maintenance reporting tools to USMC aviation community for extended evaluation. Prototype a maintenance planning tool for preliminary assessment, and develop and demonstrate mission sensitive aircraft resumes as an integrated view into short-range and long-range maintenance and flight operations planning. Prototype and demonstrate an immersive user interface for CACE products that adjusts to the capabilities and requirements of the user. Develop Joint Strike Fighter Program Office impact assessment.
- Common Spectral MASINT Exploitation: Demonstrate the utility of spectral data with operational assets. COSMEC ground station will be implemented in EUCOM, as well as the support of tactical airborne sensors. Integrate the COSMEC system into the digital common ground station (DCGS) architecture and develop a COSMEC V2.0 for support of National Air Intelligence Center (NAIC) and operational users.
- Compact Environmental Anomaly Sensor II: Demonstrate mission support. Perform system on-orbit calibration and user support. Develop operational concepts for distributing environmental data.
- Force Medical Protection/ Dosimeter: Demonstrate real-time chemical sampler with biological agent collection capabilities. Conduct Phase I field evaluations. Complete field evaluation of Phase II sampler. Conduct technology lab testing. Transition system to the CINC level.
- Human Intelligence and Counterintelligence Support Tools: Assess CONOPS, equipment and architecture in Joint Warfighting exercises. Conduct OCONUS real-world military utility assessment and operational evaluation.
- Joint Medical Operations – Telemedicine: Complete capstone demonstration of integrated JMO-T capabilities. Complete the initial military utility assessment. Demonstrate integrated modeling and simulation capabilities for deploying medical forces. Prepare designated units to accept leave behind capability tactics and capabilities.
- Joint Theater Logistics: Expand capability to integrate in-theater distribution support planning and infrastructure assessment and compare alternative courses of action. Create temporal task identification and support force assignment. Forecast and assess the impact of deviations and alternative support concepts upon future operations.
- Personnel Recovery Mission Software: Complete integration and conduct operational assessment at CENTCOM's Internal Look 01 exercise. Complete lessons learned revisions from Internal Look 01 and begin delivery of user leave-behinds. Initiate transition activity.
- Small Unit Logistics: Final demonstration during Desert Knight. Receive interim authority to operate until fielding in the FY02 Program Objective Memorandum with a milestone decision from the USMC. Conclude the interim capability period and end the ACTD.
- Theater Air and Missile Defense Interoperability: Conduct user assessment of the AEGIS/PATRIOT integrated air picture capability through a real-time engage-on-remote demonstration. Collect Theater High Altitude Area Defense (THAAD)/Cooperative Engagement Capability (CEC) integration data and prepare integration approach and concept. Initiate single, integrated air-picture evaluation by integrating existing sensor systems in Korean theater of operations.

FY 2000 Starts:

- Coalition Aerial Surveillance and Reconnaissance: Participate in a live-fly exercise in Europe and evaluate the interchange format, registration algorithms,

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and moving target indicator (MTI) association, correlation and tracking algorithms. Continue development and integration of MTI-Synthetic Aperture Radar (SAR) cueing algorithms, the MTI-SAR common operational picture (COP), and mission planning and tasking tools.

- CINC 21: Demonstrate in Kernel Blitz exercise support for the PACOM Joint Mission Force concept by implementing CINC-to-Joint Task Force and component dynamically-shared plans and situation awareness. Continue joint coalition development of interoperable knowledge sharing.
- Communication/Navigation Outage Forecasting System: Initiate on-orbit sensor fabrication.
- Computerized Operational MASINT Weather: Demonstrate and continue to validate algorithms to exploit Computerized Operational MASINT Weather products at theater level. Improve infrastructure for dissemination of data to theater. Begin development of CONOPS for use of products in theater. Continue development of future sensor requirements.
- Content-Based Information Security: Complete development and test of the Phase I module of the Security Card. Initiate development of the cryptographic Key Management product with National Security Agency (NSA). Initiate development of the Phase II (data-at-rest) module of the CBIS security card. Form a CONOPS working group. Initiate coalition interoperability with Canadian Forces.
- Global Monitoring of Space ISR Systems: Establish architecture for data acquisition and processing and begin planning for the demonstration phases. Collect sample data for capability development.
- Ground-To-Air Passive Surveillance: Complete demonstration system specifications and amend/downsize the prototype to provide a two-dimensional (2-D) tracking system that is compatible with counter drug testing and assessment. Conduct testing on controlled ranges to evaluate passive detection and 2-D target tracking from a mobile platform on Chesapeake Bay. The testing phase will include planning, modeling and simulation, mission specific hardware modifications, installation, assessment and training. The users will be trained on the system and participate in real-time inter-operation with the existing command and control functions.
- Joint Intelligence, Surveillance and Reconnaissance: Establish baseline capability with virtual/man-in-the-loop demonstrations. Integrate software on prototype hardware and participate in initial field demonstrations. Continue to demonstrate capabilities at both ARCENT's Lucky Sentinel Exercise and 1 Marine Expeditionary Force (1 MEF) Exercise (MEFEX).
- Multiple Link Antenna System: Complete design refinements for RF component elements. Fabricate and conduct lab tests and early interim assessments of improved elements. Complete design and initiate fabrication of interim and final demonstration antenna systems . Initiate design of antenna control system software and system integration. Continue systems engineering efforts leading to antenna configuration demonstrations and field tests.
- Quick Bolt: Continue design reviews, system integration and system testing of the components of the front-end guidance mechanisms.
- Restoration of Operations: Complete Joint Chemical Field Trials and technology assessments. Develop and conduct the baselining exercise. Refine methodology for operational capability assessment and plan for technology transition.
- Tri-Band Antenna Signal Combiner: Complete fabrication of antenna signal combiner. Begin military utility assessment and field trials. Prepare for transition to acquisition.

FY 2001 Starts:

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- Active Network Intrusion Defense (ANID): Develop technical reference model. Model candidate agent frameworks and collaborative interfaces and select appropriate technologies. Collect and correlate user requirements. Develop software requirements specification. Determine initial interfaces to exterior data sources such as sensors and firewalls. Install a prototype system on the Defense Information Systems Network-Leading Edge Services (DISN-LES). Provide demonstration of the agent framework component and correlation of data. Demonstrate the dynamic constitution of a virtual organization.
- Adaptive Battlespace Awareness: Demonstrate, in the EUCOM area of responsibility (AOR), the enhancement of the COP track data structures to allow tracks to be "tagged" with amplifying information such as targeting status and other relevance indicators for specific situations, events or tasks.
- Advanced Tactical Laser (ATL): Design laser assembly, fuel system, and optics to fit in a roll-on/roll-off package for the CV-22 aircraft. Validate current laser performance and stability.
- Advanced Technology Ordnance Surveillance (ATOS): Develop concept of operations, finalize system requirements, and evaluate commercial-off-the-shelf radio frequency identification (RFID) and micro-electro-mechanical systems (MEMS) technologies to develop and demonstrate RFID/MEMS technology for monitoring ordnance inventory and environmental data.
- Coalition Combat Identification (CCID): Initiate Single Channel Ground and Airborne Radio System (SINCGARS)-based combat identification (SBCI) radio software upgrades. Initiate integration of improved SBCI waveform into Fire Support Team (FiST) system. Evaluate potential implementation of SBCI into allied digital radios including the UK Bowman radio. Coordinate Allied (France, UK, Germany) participation in the ACTD. Initiate development of STANAG 4579 compliant waveform. Define dismounted soldier efforts with Allies.
- Coalition Theater Logistics (CTL): Commence ACTD development efforts. Establish program development organizations and working groups. Develop the ACTD management plan and define technical and operational requirements. Conduct business process review to model coalition theater logistics concepts. Begin CTL CONOPS development. Conduct concept demonstration using Joint Logistics ACTD tools and demonstrate Australian Logistics Encyclopedia.
- Coastal Area Protection System (CAPS): Demonstrate the feasibility of deploying technologies in the coastal/littoral areas for force protection. The system demonstrations will consist of technologies to support the surveillance , identification and exclusion of threats in the vicinity of ports and harbors. The goal is to provide a rapid capability to the U.S. Navy, U.S. Marine Corps, and U.S. Army prepositioning ships, as well as a fly-away capability for contingency operations. End the ACTD.
- Hunter Standoff Killer Team (HSKT)**:** Integrate cognitive decision aiding technologies into the Army Airborne Command and Control System (A2C2S) to develop Mobile Commander's Associate (MCA) capability and the Longbow Apache helicopter to develop Warfighter's Associate (WA) capability. Integrate manned and unmanned teaming algorithms and software into the MCA and WA systems. Develop Link 16 data terminal for the Joint Standoff Weapon (JSOW) to provide enroute targeting updates for weapons delivery. Conduct preliminary design of sensor package for integration into unmanned aerial vehicle.
- Joint Area Clearance (JAC): Commence demonstration phase. The first half of FY 2001 will focus on obtaining and preparing area clearance technologies. The second half of FY01 will develop a training strategy that will feed several small-scale demonstrations at the Joint Readiness Training Center (JRTC). A CONOPS working group will be established by the Operational Manager (USJFCOM) to plan and coordinate demonstrations.
- Loitering Electronic Warfare Killer (LEWK): Produce and approve the Management Plan. Establish Integrated Product Teams. Begin preparation of the

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Functional Requirements Document (FRD), which will become the basis for an Operational Requirements Document. Award contract to finalize sub-systems and systems design, and begin integration and testing.

- Network Centric Collaborative Targeting (NCCT): Initiate improvement of front-end processing of AWACS, Guardrail, Rivet Joint, Compass Call, JSTARS, U-2, Nimrod and ASTOR products to decrease time and spatial error for time critical targeting.
- Personnel Recovery Extraction Survivability Aided by Smart Sensors (PRESS): Conduct studies to integrate Global Personnel Recovery System (GPRS) Public and Government segments, RF Tags, and Combat Survivor Evader Locator (CSEL) Radio systems. Install baseline GPRS on HH-60G Pavehawk helicopter to provide a prototype command, control and tracking system. Conduct cost and operational effectiveness analysis (COEA) of extraction survivability and situational awareness technologies, including cognitive decision aides (CDA), rapid terrain visualization, infrared countermeasures (IRCM), millimeter wave imaging, obstacle avoidance, non-lethal weapons and unmanned aerial vehicles.
- Tactical Missile System –Penetrator (TACMS-P): Initiate the ACTD and begin detailed engineering of the missile system .
- Theater Integrated Planning Subsystem (TIPS): Acquire, integrate and install available commercial-off-the-shelf (COTS) information technology (software and hardware) to provide first automated theater planning capability to support theater CINCs. Core functions and infrastructure to support the deliberate planning process and distributed collaborative planning will be installed on the new theater-planning suite.

(U) **FY 2002 Plans:** Continue the process of transitioning and initiating ACTDs. Numerous demonstrations will be conducted for those ACTDs initiated in previous years. All FY 1996-initiated ACTDs should end. The demonstration phases of the FY 1997 and FY 1998-initiated ACTDs should be completed. Funding will continue for ongoing ACTDs initiated in FY 1996 through 2001 ($118.917 million total for all prior year ACTDs). Funding available for initiating new FY 2002 ACTDs will be approximately $30 million. (Total ACTD funding: $148.917 million).

(U) Other significant plans for FY 2002 are:

FY 1996 Starts:

- Air Base/Port Biological Detection: Conclude the interim capability period and end the ACTD.
- Tactical High Energy Laser: Conclude the interim capability period and end the ACTD.

FY 1997 Starts:

- Counterproliferation II: Execute two operational demonstrations and perform military utility assessment of AGM-86D CALCM Block II penetrator against a hardened, cut-and-cover WMD facility. Conduct operational tests of the BLU-116 AUP integrated into the Navy's Enhanced Guided Bomb Unit (EGBU-24). Continue RDT&E on Enhanced Payloads. Complete JASSM operational test and demonstration against an above-ground simulated biological weapons facility.
- Extending the Littoral Battlespace: Complete military utility assessment. Refurbish and reinstall partial ELB ACTD-configuration TEMPALT to TARAWA ARG for deployment. Install partial ELB configuration to Theodore Roosevelt Battle Group for deployment. Enter lessons learned into

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appropriate databases/finalize ELB technical documentation. Support transition efforts with appropriate acquisition programs.

- Integrated Collection Management: Commence interim capability support period.
- Joint Advanced Health and Usage Monitoring System: Conduct operational demonstration. Conduct maintenance re-engineering assessment and health and usage monitoring system (HUMS) technology assessment and cost/benefit analysis.
- Military Operations in Urban Terrain: Continue to provide support to residual equipment in Extended Utility Evaluation Phase. Collect RAM data and data on refinement of tactics, techniques, procedures and requirements. Complete transitions and end the ACTD.

FY 1998 Starts:

- Adaptive Course of Action: Complete final hardening and transition of the complete ACOA system to the Global Command and Control System. Complete transition of ACOA operations and maintenance responsibilities to DISA. Conclude interim capability support period to end the ACTD.
- C4I for Coalition Warfare: Participate in the Communications Interface Design (CID) Borealis demonstration. Conduct a demonstration, involving the United States (Maneuver Control System Block IV), Canada, Denmark, France, Germany, Italy, the Netherlands, Spain and the United Kingdom, of the database replication capability. A fielding decision on the database replication mechanism will be made based on the demonstration results. Conclude the interim capability support period and end the ACTD.
- Information Assurance: Automated Intrusion Detection Environment: Per operational requirements, begin transition of AIDE to CINCs and other operational components. Multimedia system training aids will be provided. Conclude the interim capability support period to end the ACTD.
- Joint Continuous Strike Environment: Conduct several military utility assessments in live exercises. Transition to relevant Service fire support systems and provide technical support. End the ACTD.
- Line-of-Site Anti-Tank: Conduct final design reviews for fire unit, missile, and training equipment, and begin fire unit and missile component fabrication. Conduct component qualification testing, begin sub-assembly of components, and prepare for final integration and assembly. Complete weapon system module and weapon system test-set software code and test, and finalize requirements for missile operational flight software.
- Link-16: Continue operational support to the Combine Air Operations Center (CAOC) in Kosovo. Complete development of DoD Joint Data Network (JDN) TIBS/Link 16 and IDM/Link 16 translation and data forward efforts. Plan to conduct a Joint Service Certification of the Rosetta TIBS/Link 16 and IDM/Link 16 functionality. Transition Rosetta technology (TIB/Link 16) and (IDM/Link 16) to United States Joint Service Acquisition program. Plan continued integration / prototyping of Rosetta technology into LEWK ACTD as the communications node for the tactical UAV payload. End the ACTD.
- Migration Defense Intelligence Threat Data Systems: Conduct final military utility assessment of Joint Risk Assessment Management and deployable server. End the ACTD.
- Theater Precision Strike Operations: Commence interim capability support period.

FY 1999 Starts:

- Battle Damage Assessment in Joint Targeting Toolbox (BDA in JTT): Continue development of software architecture, apply additional technology, increase functionality and expand fielded ground force models/algorithms.

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- Coherent Analytical Computing Environment: Implement data warehouse data-mining capabilities to provide source data to the mission-sensitive aircraft resumes. Develop reasoners and agents which provide command-level decision support. Update the immersive user interface to provide the commander a unified view of the squadron operations and provide an interface to all planning tools. Integrate CACE tools and provide the integrated CACE architecture to USMC aviation community for extended evaluation. Update Joint Strike Fighter Program Office impact assessment. Update Transition Plan.
- Common Spectral MASINT Exploitation: Continue integration into the Digital Common Ground Station (DCGS) architecture.
- Compact Environmental Anomaly Sensor II: Conduct user and operational utility assessments.
- Force Medical Protection/ Dosimeter: Maintain system at CINC level. Conclude interim capability support phase to end the ACTD.
- Human Intelligence and Counterintelligence Support Tools: Deliver final set of residuals to Defense HUMINT Service, USSOCOM, and appropriate elements of the Services. Finalize Concepts of Operation and Impact Assessments. Support residual participation in exercises and real-world operations.
- Joint Medical Operations-Telemedicine: Transition JMO-T capabilities for the CINC or designated component surgeon to selected units; insert available Theater Medical Information Program (TMIP) capabilities to replace JMO-T placeholder capabilities; implement operations support systems; and continue assessment of JMO-T technologies capabilities.
- Joint Theater Logistics: Focus technology upon execution tracking processes and demonstrate initial Watchboard capabilities. Demonstrate capabilities in a joint environment and conduct preliminary military utility assessment. Staff and finalize transition plans to transfer JTL ACTD capabilities to GCSS through the AITS-JPO.
- Personnel Recovery Mission Software: Continue software refinements based on inputs from customer operational testing. Complete fielding and support of PRMS to end the ACTD.
- Theater Air and Missile Defense Interoperability: Report military utility assessment of the engage-on-remote aspects. Finish fabrication and installation of limited single integrated air-picture capability.

FY 2000 Starts:

- Coalition Aerial Surveillance and Reconnaissance: Conduct a military utility assessment in a live-fly exercise and produce measures of performance/effectiveness analysis. Begin insertion of CAESAR functionality into participating country's ground stations.
- CINC 21: Demonstrate in Tandem Trust exercise a highly visual, dynamically updated capability to develop and understand the CINC's theater situation, plans, and execution status during multiple, simultaneous crises involving joint, coalition, and humanitarian agencies based on shared knowledge and collaboration across secure and optimized networks.
- Communication/Navigation Outage Forecasting System: Construct satellite sensors and integrate system.
- Computerized Operational MASINT Weather: Complete dissemination architecture for dissemination of data to theater. Integrate validated algorithms into infrastructure. Validate products/CONOPS for use of products for warfighter support. Demonstrate capability to operational user and refine products/CONOPS. Further refine future sensor requirements.
- Content-Based Information Security: Demonstrate the Phase I (data-in-transit) module of the security card. Complete the development of the Phase II

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(data-at-rest) module of the security card. Continue development of the CBIS CONOPS and develop a draft of the military utility assessment plan. Complete development of a prototype CBIS Key Management product.

- Global Monitoring of ISR Space Systems: Demonstrate capability with deployed assets.
- Ground-To-Air Passive Surveillance: Conduct operational assessment of passive surveillance systems for counter drug applications; specifically, passive detection and tracking of air and surface targets. The users will be trained on the system and participate in real-time inter-operation with the existing command and control functions.
- Joint Intelligence, Surveillance and Reconnaissance: Demonstrate baseline solution at Lucky Sentinel 02, Marine Expeditionary Force Exercises (MEFEX) and brigade-level venues. Provide modeling and simulation support to Lucky Sentinel 02, MEFEX and brigade-level venues.
- Multiple Link Antenna System: Fabricate components and assemble interim antenna. Test and initiate MLAS demonstrations in lab and field environments with interim antenna system. Continue design of antenna control system software. Initiate fabrication and integration of final demonstration antenna system. Continue systems engineering efforts leading to antenna configuration demonstrations and field tests.
- Quick Bolt: Commence lab and field test demonstrations of a fully integrated Quick Bolt system.
- Restoration of Operations: Conduct preliminary demonstration and initial military utility assessment. Continue user training and limited system functional tests. Revise concept of operations. Conduct final technology selection.
- Tri-Band Antenna Signal Combiner: Report on military utility of system. Conclude interim capability support period to end the ACTD.

FY 2001 Starts:

- Active Network Intrusion Defense: Continue gathering user requirements. Refine detection, correlation, and notification agents and collaborative interfaces. Provide automated support to convene experts, information, command-by-negation, and to build rapid coordinated responses via a distributed "virtual" cyber warfare organization. Demonstrate autonomic tracing by focusing initially on instrumentation of a portion of the Global Command and Control System (GCCS) global configuration with autonomic response and anomaly sensors. Exercise the virtual organization CONOPS.
- Adaptive Battlespace Awareness: Develop the necessary intelligence/operational interfaces and the supporting mission-specific user tailorable templates required to facilitate the display of information relevant to the task or area of interest. Demonstrate these capabilities in the EUCOM Area of Responsibility.
- Advanced Tactical Laser: Begin fabrication of high power laser system, fuel supply and optics train for integration into CV-22 aircraft. Evaluate fuel regeneration system and closed loop performance of laser.
- Advanced Technology Ordnance Surveillance: Develop the integrated radio frequency identification (RFID) and micro-electro-mechanical systems (MEMS) system. Develop a computer model and pre-processor database. Conduct component-level testing.
- Coalition Combat Identification: Continue SBCI radio software upgrades for U.S. exportable radios. Continue SBCI / FiST system integration. Continue NATO compliance development of international interoperability testbed. Initiate integration of SBCI with USMC Target Location and Data Handoff System (TLDHS). Initiate international initiative for combat ID for the individual soldier. Begin software model development for the Virtual Operational Exercise for all technologies and all countries. Participate in JCIET 02 with Allies.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/BA 3	R-1 ITEM NOMENCLATURE ADVANCED CONCEPT TECHNOLOGY DEMONSTRATIONS PE 0603750D

- Coalition Theater Logistics: Develop security and network architecture to support coalition logistics data fusion. Continue CONOPs development. Assess and select applications from Joint Theater Logistics for use in the coalition task force environment . Identify coalition partner logistics information systems interfaces and applications. Demonstrate initial capabilities and measure performance against the CTL ACTD CONOPS. Develop transition plans to GCSS.
- Hunter Standoff Killer Team: Continue software development and simulation tests. Conduct hardware-in-the-loop integration tests. Install remote target sensor into unmanned aerial vehicle. Integrate fully functional Link 16 data link, antenna and guidance software into the F/A-18 Joint Standoff Weapons (JSOW) system. Integrate F/A-18 Advanced Technology Forward Looking Infrared Radar (ATFLIR).
- Joint Area Clearance (JAC): Demonstrations will continue and increase in scope to accept space-based and tactical sensor inputs. Data from these exercises will form the basis of an interim military utility assessment in mid-FY 2002.
- Lethal Electronic Warfare Killer: Finalize the Functional Requirements Document. Begin preparation of the transition plan. Continue sub-systems and systems integration and testing. Begin initial flight testing of the vehicle without payloads.
- Network-Centric Collaborative Targeting: Conduct a cross-cueing demonstration in a live-fly exercise with the NCCT brassboard capability and a subset of the platforms.
- Personnel Recovery Extraction Survivability Aided by Smart Sensors. Complete prototype design and fabrication of miniature GPRS user device. Demonstrate technologies and conduct military utility assessment of Phase I survivor / evader systems. Complete COEA and preliminary design to integrate extraction survivability technologies on HH-60G Pavehawk. Conduct fabrication and test of CDA, IRCM, millimeter wave imaging, obstacle avoidance, and non-lethal weapon subsystems.
- Tactical Missile System – Penetrator: Continue fabrication and ground testing of missile system components.
- Theater Integrated Planning System: Continue software integration of tools supporting conventional targets into the theater-planning suite. A software workflow manager will be integrated into both the conventional and nuclear environments. Initial analysis will begin on the migration of theater planning tools to support a deployable configuration of TIPS.

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(U) ACQUISITION STRATEGY: Not Applicable

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY 2002**	**Total Cost**
Previous President's Budget Submit	104.976	116.425	118.242	Continuing
Appropriated Value		119.925		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed undistributed reduction		-.764		
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-.592	-.257		
c. Other		-.085	30.675	Continuing
Current President's Budget	104.384	118.744	148.917	Continuing

Change Summary Explanation:

(U) Funding: FY 2000 adjustments were the result of below-threshold reprogramming.
(U) Schedule: Not Applicable
(U) Technical: Not Applicable

(U) C. Other Program Funding Summary Cost : Not Applicable

(U) D. Schedule Profile: Not Applicable

(U) A: Acquisition strategy: Not Applicable

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(U) E. PE Funding for FY 1995 ACTDs:

ACTD	FY 2000
Advanced Joint Planning*	0
Cruise Missile Defense Phase I*	0
Joint Countermine*	.300
High Altitude Endurance Unmanned Aerial Vehicle*	0
Kinetic Energy Boost Phase Intercept*	0
Medium Altitude Endurance Unmanned Aerial Vehicle*	0
Precision SIGINT Targeting System**	0
Precision/Rapid Counter Multiple Launcher*	0
Rapid Force Projection Initiative*	0
Synthetic Theater of War*	0

*Completed

** Completed the demonstration phase of the ACTD

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(U) E. PE Funding for FY 1996 ACTDs

ACTD	FY 2000	FY 2001	FY 2002
Airbase/Port Biological Detection**	1.500	1.100	.800
Battlefield Awareness and Data Dissemination*	3.000	0	0
Combat Identification*	1.400	0	0
Combat Vehicle Survivability*	0	0	0
Counterproliferation I*	5.700	0	0
Counter Sniper*	0	0	0
Joint Logistics**	0	0	0
Joint Readiness Extension to Advanced Joint Planning *	0	0	0
Low Life Cycle Cost, Medium Lift Helicopter*	0	0	0
Miniature Air Launched Decoy**	2.300	3.400	0
Navigation Warfare**	0	0	0
Semi-Automated IMINT Processing*	0	0	0
Tactical UAV*	0	0	0
Theater High Energy Laser**	0	0	0

*Completed

** Completed the demonstration phase of the ACTD

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(U) E. PE Funding for FY 1997 ACTDs

ACTD	FY 2000	FY 2001	FY 2002
Chemical Add-On to Biological Detection*	0	0	0
Consequence Management*	0	0	0
Counterproliferation II	9.200	5.400	0
Extending the Littoral Battlespace	5.800	5.700	7.900
Information Operations Planning Tool**	1.700	1.700	0
Integrated Collection Management	1.800	1.300	0
Joint Advanced Health and Usage Monitoring System	4.200	2.600	2.000
Military Operations in Urban Terrain	.100	6.900	0
Rapid Terrain Visualization	4.000	5.100	0

* Completed

** Completed the demonstration phase of the ACTD

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(U) E. PE Funding for FY 1998 ACTDs

ACTD	FY 2000	FY 2001	FY 2002
Adaptive Course of Action	5.600	1.700	0
C4I for Coalition Warfare	1.200	2.000	1.200
High Powered Microwave*	0	0	0
Information Assurance: AIDE	4.000	1.700	1.600
Joint Bio Remote Early Warning System	4.000	.200	0
Joint Continuous Strike Environment	2.200	2.400	3.600
Joint Modular Lighter System**	1.300	.400	0
Line-of-Sight Anti-Tank	4.000	0	4.700
Link 16	1.600	1.700	0
Migration Defense Intelligence Threat Data System	.900	1.100	0
Precision Targeting Identification	3.300	1.900	0
Space Based Space Surveillance Operations**	.800	.800	0
Theater Precision Strike Operations	4.900	4.600	0
Unattended Ground Sensors**	1.600	.900	0

*Completed

** Completed the demonstration phase of the ACTD

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(U) E. PE Funding for FY 1999 ACTDs

ACTD	FY 2000	FY 2001	FY 2002
Battle Damage Assessment in the Joint Targeting Toolbox	.400	.200	.200
Coherent Analytical Computing Environment	1.000	1.300	.400
Common Spectral MASINT Exploitation Capability	1.300	1.100	.200
Compact Environment Anomaly Sensor	0	.100	.100
Force Medical Protection	.600	.100	.200
Human Intelligence and Counterintelligence Support Tools	1.900	2.700	.600
Joint Medical Operations Telemedicine	2.900	.600	1.600
Joint Theater Logistics	1.000	0	0
Personnel Recovery Mission Software	.900	.600	0
Small Unit Logistics	.600	0	0
Theater Air and Missile Defense Interoperability	4.300	4.800	2.200

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(U) E. PE Funding for FY 2000 ACTDs

ACTD	FY 2000	FY 2001	FY2002
CINC 21	2.200	9.900	13.600
Coalition Aerial Surveillance and Reconnaissance	2.400	1.900	2.500
Communication/Navigation Outage Forecasting System	0	1.900	1.700
Computerized Operational MASINT Weather	1.000	2.400	1.700
Content-Based Information Security	1.500	1.900	.300
Global Monitoring of ISR Space Systems	.300	.600	.500
Ground-To-Air Passive Surveillance	.300	1.700	2.400
Joint Intelligence, Surveillance and Reconnaissance	.800	5.600	3.200
Multiple Link Antenna System	.884	.494	.900
Quick Bolt	2.100	5.300	9.500
Restoration of Operations	1.000	2.300	4.300
Tri-Band Antenna Signal Combiner	.600	.600	0

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(U) E. PE Funding for FY 2001 ACTDs

ACTD	FY 2001	FY2002
Active Network Intrusion Defense	1.500	2.400
Adaptive Battlespace Awareness	1.800	4.000
Advanced Tactical Laser	2.000	7.900
Advanced Technology Ordnance Surveillance	0	1.317
Coalition Combat Identification	0	0
Coalition Theater Logistics	1.500	3.200
Coastal Area Protection System	.750	0
Hunter Standoff Killer Team	0	0
Joint Area Clearance	2.000	3.600
Loitering Electronic Warfare Killer	1.000	7.900
Network-Centric Collaborative Targeting	3.000	7.900
Personnel Recovery Extraction Survivability Aided by Smart Sensors	1.000	4.000
Tactical Missile System Penetrator	4.300	7.900
Theater Integrated Planning Subsystem	1.200	.900

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE High Performance Computing Modernization **PE 0603755D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	163.677	171.727	188.376						Continuing	Continuing
HPCM/P507	163.677	171.727	188.376						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U)The Department of Defense (DoD) High Performance Computing (HPC) Modernization Program (HPCMP) supports the needs of the warfighter for technological superiority and military dominance on the battlefield by providing advanced computational services to U.S. weapons system scientists and engineers. By exploiting continuous advances in high performance computing technology, the defense research, development, test and evaluation (RDT&E) community is able to resolve critical scientific and engineering problems more quickly and with more precision than any potential adversary threatening national security. The results of these efforts feed directly into the acquisition process by improving weapons system designs through increased fundamental understanding of materials, aerodynamics, chemistry, fuels, acoustics, signal image recognition, electromagnetics, and other areas of basic and applied research as well as enabling advanced test and evaluation environments that allow synthetic scene generation, automatic control systems and virtual test environments. As such, high performance computing (HPC) has been identified as a key enabling technology essential to achieving the objectives of the DoD's Science and Technology (S&T) and Test and Evaluation (T&E) programs.

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(U)The HPCMP has established and supports four major shared resource supercomputing centers as well as several smaller, special-purpose distributed supercomputing centers. These centers directly support the DoD S&T and T&E laboratories and centers and are accessible to local and remote scientists and engineers via high-speed network access. Providing for the adaptation of broadband, widely used applications and algorithms to address S&T and T&E requirements, along with continued training of users as new system designs and concepts evolve, is an integral part of the program. The program pursues continuous interaction with the national HPC infrastructure, including academe, industry, and other government agencies to facilitate the sharing of knowledge, tools, and expertise.

(U)The HPCMP user base includes approximately 5,000 computational scientists and engineers and over 60 DoD laboratories and test and evaluation facilities. The integrated HPCM program consists of a set of four large Major Shared Resources Centers (MSRCs), seventeen Distributed Centers (DCs), the Defense Research and Engineering Network and the Common High Performance Computing Software Support Initiative (CHSSI). The MSRCs are responsible for as large a fraction of DoD`s S&T and DT&E computational workload as feasible. These MSRCs provide extensive capabilities to address user requirements for hardware, software, programming environments, and training. A limited set of smaller shared resource centers, Distributed Centers (DCs), augment the MSRCs to form the total HPCMP computational capability. Distributed Centers address critical HPC requirements that cannot be met at MSRCs, such as real-time, and near real-time computing requirements, and leverage significant HPC expertise located at the remote sites. The MSRCs and DCs are currently interconnected with all S&T and DT&E user sites via the Defense Research and Engineering Network (DREN). Additionally the Common HPC Software Support Initiative (CHSSI) develops a set of critical common DoD applications programs that run efficiently on advanced HPC systems at the MSRCs and Distributed Centers.

(U)True modernization of DoD`s HPC capability and fulfillment of the program's vision and goals requires an on-going program strategy that addresses all aspects of HPC. While advancing the level of hardware performance is critical to success, the higher objective is to enable better scientific research, test and evaluation environments, and technology development for superior weapons, warfighting and related support systems. The goals of the HPCMP are to:

- Provide the best commercially available high-end HPC capability.
- Acquire and develop joint-need HPC applications, software tools and programming environments.

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- Educate and train DoD's scientists and engineers to effectively use advanced computational environments.
- Link users and computer sites via high-capacity networks, facilitating user access and distributed computing environments.
- Promote collaborative relationships among the DoD HPC community, the National HPC community and MSIs in network, computer and computational science.

(U)Four major contracts to support each of the MSRCs were competitively awarded during FY 1996. These contracts provide comprehensive support services for up to eight years. The four MSRCs and their location are:

• Aeronautical Systems Center (ASC), Wright-Patterson Air Force Base, OH
• Corps of Engineers Research and Development Center (ERDC), Vicksburg, MS
• Army Research Laboratory (ARL), Aberdeen Proving Ground, MD
• Naval Oceanographic Office (NAVO), Stennis Space Center, MS

(U)Computer Science Corporation of Huntsville, AL was awarded contracts to support both the ASC and ERDC MSRCs. Logicon of Herndon, VA was awarded the contract to support the NAVO MSRC. Finally, Raytheon E-Systems of Garland, TX was awarded the contract to support the ARL MSRC

(U) There are currently 17 distributed centers. In FY 2000 three existing centers were upgraded; and four new centers were added. Currently only limited funding exists in the 2001 budget for consideration of upgrades to existing centers or establish new ones. Currently identified distributed centers and their locations are listed below:

• Air Armaments Center (AAC), Eglin AFB, FL
• Air Force Flight Test Center (AFFTC), Edwards AFB, CA

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- Air Force Research Laboratory/ Information Directorate (AFRL/SN), Rome, NY
- Air Force Research Laboratory/ Sensors Directorate (AFRL/IF), Wright-Patterson AFB, OH
- Army High Performance Computing Research Center (AHPCRC), Minneapolis, MN
- Arnold Engineering Development Center (AEDC), Arnold AFB, TN
- Arctic Region Supercomputing Center (ARSC), Fairbanks, AK
- Joint National Test Facility (JNTF), Schriever AFB, CO
- Maui High Performance Computing Center (MHPCC), Maui, HI
- Naval Air Warfare Center - Aircraft Division (NAWC-AD), Patuxent River NAS, MD
- Naval Air Warfare Center - Weapons Division (NAWC-WD), China Lake, CA
- Naval Research Laboratory (NRL-DC), Washington, DC
- Redstone Technical Test Center (RTTC), Huntsville, AL
- Space and Missile Defense Command (SMDC), Huntsville, AL
- Space and Naval Warfare Systems Center (SSCSD), San Diego, CA
- Tank-Automotive Research, Development and Engineering Center (TARDEC), Warren, MI
- White Sands Missile Range (WSMR), NM

(U)The Defense Research and Engineering Network (DREN) provides wide area network (WAN) connectivity among the Department's High Performance Computing resources (high performance computing systems and the HPC user base of scientist and engineers in the research, development test and evaluation community). The DREN is implemented through the DREN Intersite Services Contract (DISC) awarded to American Telephone and Telegraph (AT&T) in FY 1996. This contract allows the government to purchase high-speed network service to anywhere in the United States at bandwidths ranging from 3.0 megabits per second to 622 megabits per second (OC-12), with upgrade potential to 2.4 gigabits per second (OC-48). A follow-on contract will be awarded in FY2001.

(U) Given the international availability of high performance computer hardware, the protection of DoD software investments has become increasingly critical. Beginning in FY 2002 and continuing into the out-years, t echnologies and methodologies will be developed to protect and limit end-use of software while minimizing the burden on an authorized end-user.

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COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	163.677	171.727	188.376						Continuing	Continuing
HPCM/P507	163.677	171.727	188.376						Continuing	Continuing

(U) Project Number and Title: P507 HPCM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Shared Resource Centers: The program sustained the existing capability and continued the modernization process by acquiring additional HPC systems, storage, and scientific visualization capabilities to populate and upgrade the established MSRCs to fulfill the projected HPC requirements of the laboratories and R&D centers. During FY 1999 and FY 2000, contract options were executed to meet the required performance levels at the four MSRCs, minimally tripling their computing capabilities from the previous performance levels. The program continued to identify evaluate and prioritize HPC requirements for DCs and acquired and deployed new systems or upgrades to existing systems as needed to accomplish RDT&E mission needs. Basic purchase agreements through existing GSA contracts were established with each major vendor to support FY 2000 and out equipment acquisitions.

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(U)Networking: Researchers were able to take greater advantage of their connectivity to high performance computing systems and other researchers causing the bandwidth demands on DREN to continue to grow. More user sites were able to take full advantage of the DREN ATM fabric. The majority of the effort in FY 2000 centered on upgrading services to selected sites and increasing bandwidth. Low end users continued to be connected at 3 Mbps, while mid and high range users were connected at 155 Mbps and high range users at 622 Mbps. Previously planned upgrades were accomplished. Additional security enhancements were implemented. Collaborative work continued with the Federal networking community and standards associations to assure DREN remained compatible with future technology changes. Formal acquisition planning for the DREN follow-on contract continued and a request for information was issued to industry to assure new contracts are in place in FY 2001.($ 28.620 million)

(U) Software Applications Support: Development efforts in the CHSSI program continued to mature as some CHSSI projects were completed, and others begun. The CHSSI projects continued developing shared scalable applications supporting software to exploit scalable HPC assets.($ 20.520 million)

(U) MSRC Sustainment: The program sustained and supported the integration, operation and use of HPC computational resources at the four MSRCs. Acquisition planning for the program environments and training (PET) aspect of the program was completed. Partial year sustainment and operations for systems purchased and deployed in FY 2001 and cost saving resulting from the retirement of older HPC systems are included in the total FY 2001 funding requested. ($ 87.276 million)

(U) Distributed Center Sustainment: The program funded sustainment and operations at the Maui High Performance Computing Center and the Arctic Region Supercomputer Center in FY 2000. Due to program funding limitations recognized in 1996, a decision was made to typically only support investments in HPC systems at new or existing DCs with HPCMP procurement funding. In return for the HPCMP investment, the DC organization agrees to appropriately fund the sustainment and operations of the HPCMP equipment located at the site. The support to the Maui High Performance Computing Center and the Arctic Region Supercomputer Center in FY 2000 was made possible by a DoD decision to provide additional funding in FY 2000. ($ 26.461 million)

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(U) FY 2001 Plans:

(U) Congressional adds as follows: ($9.300 million)
High Performance Visualization Center ($3.0 million)
MHPCC Operations ($1.6 million)
Multi Threat Architecture System ($2 million)
SMDC Simulation Center Upgrade ($2.7 million)

(U) Shared Resource Centers: The program will sustain the existing capability and continue the modernization process by acquiring additional HPC systems, storage, and scientific visualization capabilities to populate and upgrade the established MSRCs to fulfill the projected HPC requirements of the laboratories and R&D centers. The program will continue to identify evaluate and prioritize HPC requirements for DCs and will acquire and deploy new systems or upgrades to existing systems as needed to accomplish RDT&E mission needs. The PET aspect of the program will be re-competed and transitioned to Software Applications Support for FY 2002 execution.

(U) Networking: The majority of the effort in FY 2001 will be to upgrade services to all sites and increase bandwidth. Low end users will continue to be connected at 3 Mbps, mid range users will be connected at 155 Mbps and high range users will be connected at 622 Mbps. Operation of security systems and enhancements will continue. Collaborative work will continue with the Federal networking community and standards associations to assure DREN remains compatible with future technology changes. A follow-on DREN commercial services contract will be recompeted and awarded.($ 32.191 million)

(U) Software Applications Support: Development efforts in the CHSSI program will continue to mature as some CHSSI projects are completed, and others are begun. The CHSSI projects will continue developing shared scalable applications supporting software to exploit scalable HPC assets. The Programming Environments and Training element of the program, currently contained within the MSRC support initiative will be recompeted and realigned under the Software Applications Support Initiative area for FY 2002 execution. ($ 22.204 million)

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(U) MSRC Sustainment: The program will sustain and support the integration, operation and use of HPC computational resources at the MSRCs. Partial year sustainment and operations for systems purchased and deployed in FY 2001 and cost saving resulting in the retirement of older HPC systems are included in the total FY 2001 funding requested. Funding is provided to support scientific visualization efforts. ($ 90.186 million)

(U) Distributed Center Sustainment: The program will fund sustainment and operations at the Maui High Performance Computing Center and the Arctic Region Supercomputer Center in FY 2001. Acquisition of a Multi Threat Architecture System for the Naval Research Laboratory and system upgrades for the Space and Missile Defense Command will be provided. Due to program funding limitations recognized in 1996, a decision was made to typically only support investments in HPC systems at new or existing DCs (except for the Maui High Performance Computing Center and the Arctic Region Supercomputer Center) with HPCMP procurement funding. In return for the HPCMP investment, the DC organization agrees to appropriately fund the sustainment and operations of the HPCMP equipment located at the site. The support to the Maui High Performance Computing Center and the Arctic Region Supercomputer Center in FY 2001 was made possible by a DoD decision to provide additional funding in FY 2001. The Maui High Performance Computing Center and the Arctic Region Supercomputer Center are programmed to receive $ 5.0 Million each per year in sustainment and operations funding in the out years. ($ 27.146 million)

(U) FY 2002 Plans:

(U) Shared Resource Centers: The program will sustain the existing capability and continue moderni zing HPC systems, storage, and scientific visualization capabilities to fulfill a significant portion of the projected the R&D & laboratory and center HPC requirements. Acquisition planning will begin for follow-on support at the MSRCs.

(U) Networking: Network services provided under DISC will transition to the follow-on service provider. Operation of security systems and enhancements will continue. Collaborative work will continue with the Federal networking community and standards associations to assure DREN remains compatible with future technology change.
($ 32.884 million)

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(U) Software Applications Support: Development efforts in the CHSSI program will continue to mature as some CHSSI projects are completed, and others are begun. The CHSSI projects will continue developing shared scalable applications supporting software to exploit scalable HPC assets. The Programming Environments and Training effort will continue to provide computational and computer science support to the DoD HPC user community through interaction and collaborative projects with academic and industrial partners. A program will be established to develop technologies and methodologies to protect and limit end-use of high performance computing applications software while minimizing the burden on authorized end-users. This effort is intended to strengthen DoD's protection mechanisms thus reducing the risk that these high value applications could be employed by an unauthorized user.
($ 62.553 million)

(U) MSRC Sustainment: The program will sustain and support the integration, operation and use of HPC computational resources at the four MSRCs. $18.0 million in funding will be realigned to Software Applications Support for Programming Environments and Training effort ($ 76.093 million)

(U) Distributed Center Sustainment: Due to program funding limitations recognized in 1996, a decision was made to typically only support investments in HPC systems at new or existing DCs with HPCMP procurement funding. In return for the HPCMP investment, the DC organization agrees to appropriately fund the sustainment and operations of the HPCMP equipment located at the site. There are two exceptions. The program has budgeted $8M each for the Maui High Performance Computing Center and the Arctic Region Supercomputer Center in FY 2002.
(16.846 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Performance Computing Modernization **PE 0603755D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	164.262	164.027	137.988	Continuing
Appropriated Value	0.000	173.327	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-1.213	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-.585	-0.387	0.000	
c. Other	0.000	0.000	50.388	
Current President's Budget	163.677	171.727	188.376	Continuing

Change Summary Explanation

(U) Funding: The funding adjustments in FY 2000 are based program budget decisions. FY 2001 reductions reflect Section 8086 adjustments and program budget decisions.

(U) Schedule: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Performance Computing Modernization **PE 0603755D8Z**

(U) Technical: N/A

(U) C. Other Program Funding Summary Cost

FY 2000	FY 2001	FY 2002
95.376	79.418	50.763

To Complete	Total Cost
Continuing	Continuing

MILESTONE SCHEDULE:Fiscal Years
Milestone II Decision Review1Q 1996
Awards for MSRC Contracts (Performance Level 1) 2Q, 3Q, 4Q 1996
Award for DREN (DISC) 4Q 1996
MSRC Performance Level 1 Capability Installed 1Q 1997 - 4Q 1997
In-Process Review 3Q 1997
MSRC Performance Level 2 Capability Installed 2Q 1997 - 3Q 1998
DREN Initial Performance Capability 3Q 1997
IDREN to DREN Transition Complete 4Q 1998
MSRC Performance Level 3 Capability Installed 2Q 1999 - 3Q 2000
Program Review 2000 3Q 2000
Establish Basic Purchase Agreement With Major Vendors Through GSA Contract) 1Q - 2Q 2001
PET Follow-on Contract(s) (Recompete) 3Q 2001
DREN Follow-on Contract (Recompete) 3Q 2001
MSRC Technology Insertion-01 Capability Installed 2Q 2001 - 1Q 2002

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Performance Computing Modernization **PE 0603755D8Z**

(U) D. Acquisition Strategy: (U)Program Environments and Training (PET): A full and open competition is ongoing for the follow-on PET activity. This will be coupled with a six month contract extension to insure a smooth transition. Award of the new contract is planned for the summer of 2001.

(U) Defense Research and Engineering Network (DREN): A full and open competition is ongoing for the follow-on to DREN. A contract extension is also being negotiated to allow for a 12- 18 month transition. Award of the new contract is planned for the summer of 2001.

(U) Major Shared Resource Centers: Technology Insertion – 01 is ongoing. Each year the program collect benchmark performance information in the form of DoD relevant application benchmarks and specific performance-based quotes from the HPC vendors in order to formulate specific procurement plans.

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Software Engineering Institute **PE 0603781D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	21.091						Continuing	Continuing
P781	0.000	0.000	21.091						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) Beginning in FY 2002, the funding for the Software Executive Institute's (SEI) program has been transferred from DARPA under PE 0602301E, Project ST-22 to OSD, PE 0603781D8Z. This transfer aligns the funding authority with the program management oversight responsibilities for the SEI program.
(U) Software is key to meeting DoD's increasing demand for high quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems. This project funds the technology transition activities of the Software Engineering Institute (SEI) at Carnegie Mellon University. The SEI is a R&D Laboratory Federally Funded Research and Development Center (FFRDC) sponsored by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. It was established in 1984 as an integral part of the DoD's software initiative to identify, evaluate, and transition high leverage software engineering technologies and practices. The SEI fosters disciplined software engineering practices by DoD acquisition and life cycle support programs and by the industrial base where the bulk of defense software is produced. The Institute works across government, industry, and academia to: (1) improve current software engineering activities from both management and engineering perspectives; (2) facilitate rapid, value-added transition of software engineering technology into practice; and (3) evaluate and calibrate emerging software engineering technologies to determine their potential for improving the evolution of software-intensive DoD systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Software Engineering Institute **PE 0603781D8Z**

(U) The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs. FY 2000 focus areas were: Technical Engineering Practices (including Survivable Systems practices, Architecture-centered Software Engineering, and Commercial Off-The-Shelf (COTS)-Based Software Engineering); Enhanced Software Management Capabilities (including personal and team software development processes and Capability Maturity Model Integration (CMMI)); and accelerating Adoption of High Payoff Software Technologies.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Software Engineering Institute **PE 0603781D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	21.091						Continuing	Continuing
SEI/ P781	0.000	0.000	21.091						Continuing	Continuing

(U) Project Number and Title:

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2002 Plans:

(U) Software Engineering Technical Practices.

- At least one new emergent algorithm is being used to analyze and improve the survivability of at least one infrastructure application.
- Specification methods for survivable systems have been developed, including the definition of a mission lifecycle process for survivable systems. A preliminary set of survivability metrics is in use by at least two government organizations
- The Product Line Technical Probe, a method for evaluating an organization's readiness to develop a software product line, is in use by at least two DoD organizations, leading to a product line development effort within these organizations, with cost, schedule, and quality improvements typical of those experienced by commercial organizations.
- A new initiative dealing with predictable assembly of certified software components is underway, with at least two active collaborating organizations.
- Tool support for model-based verification is being provided make the use of these analysis and verification techniques more widely accessible.

($ 10.741 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Software Engineering Institute **PE 0603781D8Z**

(U) Software Engineering Management Practices

- A CMMI lead assessor program has been established and authorized transition partners are conducting CMMI appraisals.
- The transition of the Team Software Process (TSP) into practice is accelerating, with at least ten organizations licensed to coach TSP teams and coaching at least ten organizations introducing TSP.
($ 4.350 million)

(U) Adoption of Software Technologies.
- Software engineering technology change management practices are in use by at least one DoD organization, who is accurately estimating and measuring the speed and cost associated with introducing software engineering innovations.
($ 3.500 million)

(U) Software Intensive Systems Collaboration Group Efforts

- A Software Collaborator's Group has been established to improve the state of practice in DoD software development and acquisition by helping to implement the November 2000 recommendations of the Defense Science Board Task Force on Defense Software.
- An Independent Expert Review assessment team will help program managers identify key issues and provide guidance for risk mitigation/management
($2.500 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Software Engineering Institute **PE 0603781D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000	
Appropriated Value	0.000	0.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	0.000	0.000	21.091	
Current President's Budget	0.000	0.000	21.091	Continuing

Change Summary Explanation

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Software Engineering Institute **PE 0603781D8Z**

(U) **Funding**: Beginning in FY 2002, SEI PE 0602301E currently funded in DARPA has been transferred to PE 0603781D8Z to align the funding authority with the management responsibility.

(U) **Schedule**:

(U) **Technical**:

(U) **C.** **Other Program Funding Summary Cost**

(U) **D.** **Acquisition Strategy**:

(U) **E.** **Schedule Profile**:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Quick Reaction Special Projects (QRSP) **PE 0603826D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	25.000						Continuing	Continuing
QRSP	0.000	0.000	25.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) The Quick Reaction Special Projects (QRSP) program would be used to initiate high-priority or high-leverage science and technology projects in the execution year. Projects would be initiated at the direction of the USD (AT&L) or Director, Defense Research and Engineering (DDR&E). The program funds would be managed by the Deputy Under Secretary of Defense (Science and Technology). QRSP projects would be conducted by a military department or defense agency with active S&T programs, awarded competitively. Examples of the types of projects that are envisioned would include accelerating promising research or development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE July 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Quick Reaction Special Projects (QRSP) **PE 0603826D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	25.000						Continuing	Continuing
QRSP	0.000	0.000	25.000						Continuing	Continuing

(U) Project Number and Title: Quick Reaction Special Projects

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2002 Plans:

(U) Establishing a "Quick Reaction Special Projects" (QRSP) provides the flexibility to respond to emergent DoD issues and address technical surprises and needs in real time. Critical technology in support of acquisition programs could be focused to reduce the cycle time. The QRSP program would be used to initiate high-priority or high-leverage science and technology projects in the execution year. Projects would be initiated at the direction of the USD (AT&L). The program funds would be managed by the Deputy Under Secretary of Defense (Science and Technology). QRSP projects would be conducted by a military department or defense agency with currently active S&T programs and awarded competitively. No specific organization or program area will receive the majority of funding (i.e. Advanced Concept Technology Demonstrations). ($25.000 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE July 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Quick Reaction Special Projects (QRSP) **PE 0603826D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000	
Appropriated Value	0.000	0.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	0.000	0.000	25.000	
Current President's Budget	0.000	0.000	25.000	Continuing

Change Summary Explanation.

(U) Funding: Originally placed in PE 0603825D8Z, Multidisciplinary Technology Initiatives. These funds should be in PE 0603826D8Z, Quick Reaction Special Projects (QRSP), and this is a program beginning in FY 2002.

(U) Schedule: N/A

(U) Technical: This is a new PE started in FY 2002 to.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE July 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Quick Reaction Special Projects (QRSP) **PE 0603826D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Joint Wargaming Simulation Management Office **PE 0603832D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	66.616	62.390	45.065						Continuing	Continuing
JSM/P476	66.616	62.390	45.065						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

The Defense Modeling and Simulation Office has corporate-level responsibility for the cooperation and synergism of modeling and simulation (M&S) activities within the Department of Defense. M&S has demonstrated the capability to revolutionize the way in which the Department makes decisions and conducts its operations. Working as a system of systems, M&S can support a full range of applications (e.g. joint training, doctrine development, formulation and assessment of operational plans, mission rehearsal, force structuring and the acquisition of new systems). To ensure effective and efficient use of M&S, the Department has developed a strategy fostering interoperability and re-use, embodied in the Department of Defense Modeling and Simulation Master Plan, which serves as the basis for execution of this program. The major element of the strategy is development of a common technical framework (CTF) for M&S consisting of three components: the High Level Architecture; Functional Descriptions of the Mission Space (FDMS); and Data Standardization. Supporting these is a broad range of shared common services which include environmental representations; human and organizational behavioral representation; verification, validation and accreditation of simulations; a modeling and simulation resource repository; a modeling and simulation information analysis center; and outreach and education initiatives to ensure standardized and timely implementation of the plan. All aspects of these efforts are focused on the Warfighters of today and tomorrow through a rigorous and ongoing process of capturing and addressing Warfighting customer needs and requirements. As a result of this effort, the Department will be able to lead, integrate and leverage M&S technologies for the Warfighter and thus improve readiness, enhance mission rehearsal, optimize investment decisions, and achieve cost-effective acquisitions.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	66.616	62.390	45.065						Continuing	Continuing
JSM/P476	66.616	62.390	45.065						Continuing	Continuing

(U) Project Number and Title: P476 JSM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Three operational builds of the High Level Architecture (HLA) Runtime Infrastructure (RTI) 1.3 NG (Next Generation) were completed. The HLA Federation Management Tool, Federation Verification Tool and Data Collection Tool were upgraded in concert with new RTI versions.

(U) Developed and delivered FDMS (formerly CMMS) Data Interchange Format (FDMS-DIF version 2.0) as an XML-based knowledge exchange representation for military operations descriptions. Developed and deployed two knowledge acquisition tools (DoD Capture version 1.0 and FDP-KAT version 3.3). Developed and deployed the fifth operational build of the FDMS Model Library (version 5.0) to fully support FDMS-DIF version 2.0. Developed and delivered UOB Toolset version 3.0) as a DoD Data Dictionary System (DDDS) based knowledge exchange representation for units, personnel, and equipment. Provide Functional Data Administration for M&S in accordance with DoDD 8320.1.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Completed the definition of the SEDRIS data interchange mechanism to include establishing an initial set of data access and data transmittal review software tools. Successfully initiated development of six standards based on SEDRIS technologies under the International Standards Organization and the International Electro-technical Commission. SEDRIS technology inserted into the Close Combat Tactical Trainer (CCTT), USSOCOM Database Generation Facility and Joint Simulation System (JSIMS). DMSO integrated environmental technologies supported database preparation and use in Virtual Emergency Response Training System, the Joint Strike Fighter Program, Navy Global 2000 and Fleet Battle Experiments, and use through the Joint Warfare System in preparation for the Quadrennial Defense Review. Environmental Scenario Generation capability generated weather scenarios for use by simulation developers and exercise planners providing consistent and correlated scenarios for analysis, testing, and training simulations. Executed an end-to-end demonstration of the Integrated Natural Environment (INE) Process -- a timely, scenario-driven physically-consistent, cross-domain authoritative “ground truth“ of the natural environment based upon user requirements -- to a simulation federation.

(U) Human Behavior Representation needs for M&S communities in Training and Analysis were identified and prioritized resulting in three efforts under research and development: Next Generation Synthetic Forces, Common Modeling Development Environment, and a Decision Model not based on optimization techniques.

(U) M&S Verification Validation & Accreditation guidance on-line with dynamic and interactive capabilities; prototyped VV&A tool and concepts.

(U) The M&S Resource Repository delivered two software releases enabling the ability to search DMSO, service, BMDO, and C4ISR DSC repositories simultaneously; and better catalog resources by creating more diverse resource types, and permitting users to link any resource to multiple documents, located locally or on the internet. Developed and deployed preliminary controlled vocabulary (flat key word list).

(U) The M&S Information Analysis Center (MSIAC) supported 1562 M&S customers resulting in millions of dollars of cost avoidance value. Supported M&S exercises in the areas of experimentation and technology development. Established Special Interest Areas in training, acquisition, weapons of mass destruction, operations other than war, M&S community needs, and simulation-based acquisition.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	R-1 ITEM NOMENCLATURE Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Refined and updated existing M&S education courses to ensure they reflect current DoD programs, initiatives and changes and presented them to over 2000 customers and users. Commenced effort to develop and distribute new courses through electronic technologies.

(U) Established the process to select and cooperatively develop science and technology projects with high payoff to the Department`s M&S program.

(U) Identified C4I-to-simulation requirements within the Defense Information Infrastructure (DII) Common Operating Environment (COE), and coordinated implementation of common solutions for interface capabilities. Demonstrated the ability to re-use Global Command and Control System (GCCS) C4I-to-simulation interfaces across variety of simulations and domains.
($ 75.416 million)

(U) FY 2001 Plans:

(U)(U) The High Level Architecture (HLA) program will focus on the implementation of the new Institute of Electrical and Electronics Engineers (IEEE) specification (1516). A new IEEE 1516 Runtime Infrastructure (RTI) will be developed, tested, fielded and optimized. HLA Tools, including the Object Model Development Tool, Federation Execution Planner`s Workbook Tool, Federation Verification Tool, Federation Management Tool and Data Collection Tool will be upgraded to the new specification. Experimentation with and performance of the RTI will be preformed and measured in consonance with acquisition programs technical requirements.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Begin bayan integration research. Integrate Functional Descriptions of the Mission Space (FDMS) Data Interchange Format (DIF) version 2, the C4ISR Architecture Data Model (CADM) version 2, and selected portions of the Synthetic Environment Data Representation and Interchange Specification (SEDRIS) to produce version 1 of the Military Domain Representation Framework (MDRF) knowledge exchange representation. Adapt FDMS products to employ the M&S Resource Repository Authorization and Authentication (A&A) product. Adapt the knowledge acquisition tools (DoD Capture version and FDP-KAT) to support WarSim Behavior Representation Language, TRADOC Transformation of the Army, and OneSAF. Develop and deploy FDMS Model Library version 6.0 to provide scripted workflow procedures and to support round trip data exchange with CADM version 2.0.; Continue to provide Functional Data Administration for M&S in accordance with DoDD 8320.1.

(U) Begin development of the Electronic Order of Battle (EOB) Toolset and Task Organization Toolset (TOTL). Begin transition of the Joint Munitions Effectiveness Manual (JMEM) to the Joint Munitions Effectiveness Toolset (JMET). Integrate the ADS Library into the Modeling and Simulation Resource Repository (MSRR). Adapt the UOB Toolsets to employ the MSRR Authorization and Authentication (A&A) product. Complete development of UOB Toolset by deploying version 4.0. Develop and deploy the Data Verification Interactive Editor (DAVIE) version 2.0 to support XML-based data structures.

(U) Complete environmental interchange mechanism definition and full technical documentation. Expand software tools for Synthetic Environment Data Representation and Interchange Specification (SEDRIS) transmittal generation, verification, and consumption. Complete atmosphere and ocean common data model development and promote captured requirements within the M&S and operational data provider communities. Evaluate sources and procedures for the use of alternate sources for database generation, to include commercial options. Provide additional tools, reference data sets, policies and procedures for the generation of integrated databases expanding existing terrain and ocean capabilities and integrating atmosphere and space data and effects. Initiate development of the key technical components of an INE Authoritative Representation Process to facilitate the scenario composition and generation of consistent environmental representations. Expand operational capability for Master Environmental Library with both Internet and SIPRNET capability. Complete meta-data specification and implementation in access and resource site software. Continue a series of periodic end-to-end experiments/demonstrations to assess and validate the progress of technical development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Initiate the development of technologies and tools to support incorporation of authoritative representations of human and organizational behavior into DoD simulations. Continue development of efforts in: Next Generation Synthetic Forces, Common Modeling Development Environment, and a Decision Model not based on optimization techniques.

(U) Initiate Verification, Validation, and Accreditation (VV&A) studies: fidelity, specifications for reuse, and conceptual framework model coverage. Perform technical analysis of human behavior models with respect to VV&A practices and methods. Assess on going tool developments.

(U) Restructure M&S Resource Repository (MSRR) registration database to more robust form. Develop and deploy classified software version with appropriate markings and classified administrative functions. Develop a true controlled vocabulary across all nodes, and a cross node key word search to support the controlled vocabulary. Develop an application programmer interface (API) to support interchange with other systems. Enhance interoperability to include use of a common syntax of logical operators in cross system searches. Incorporate all joint authoritative data sources into the MSRR.

(U) Utilize the M&S Information Analysis Center for core-level M&S services.

(U) Continue to provide support to the Warfighter by establishing the right mix of M&S courses targeted specifically toward warfighting activities and to those new to M&S; Establish the right mix of resident and on-line (Advanced Distributed Learning (ADL)) courses. Develop and present new courses that focus on the M&S Functional Areas (FA) and the requirements of the Warfighter, the trainer, the analyst, and those working in the field of experimentation. Commence the incorporation of critical M&S education into service academies, service schools and staff colleges, both resident and ADL.

(U) Continue to select and cooperatively develop science and technology projects with high payoff to the Department`s M&S program.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Refine C4I-to-simulation requirements within the Defense Information Infrastructure (DII) Common Operating Environment (COE), to develop a comprehensive System Requirements Specification. Complete segmentation of HLA RTI within DII COE. Complete development of JTLS-GCCS federation and demonstrate capabilities in a Joint training exercise.
($ 56.390 million)

(U)Congressional add as follows: ($6.000 million)
Synthetic Range Study ($3.0 million)
WMD Attack-Effects-Response Assessment capability at USJFCOM ($3.0 million)

(U) FY 2002 Plans:

(U) The High Level Architecture (HLA) program will continue to address performance issues to insure that technical requirements are met for the JSIMS IOC. The RTI development will continue as needed to support IEEE 1516 implementation. Federation development tool support efforts will continue to address the needs of new federations during initial implementation of the HLA. The RTI Verification and Federate Compliance Testing continue as new simulations become HLA compliant.

(U) Continue bayan integration research. Develop and disseminate initial bayan integration procedure. Develop and deploy MDRF knowledge exchange representation version 2 to add initial system of system representation. Adapt the knowledge acquisition tools to support selected JMASS representation requirements. Develop and deploy FDMS Model Library version 7.0 to provide initial capability for distributed data repositories.; Continue to provide Functional Data Administration for M&S in accordance with DoDD 8320.1.

(U) Begin Materiel Configuration Toolset (MCT) development. Continue Electronic Order of Battle (EOB) Toolset and Task Organization Toolset (TOTL) development by deploying version 1 of each toolset. Complete JMEM transition to JMET. Complete development of DAVIE development by deploying version 3.0.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Complete SEDRIS standardization and guidance product development. Expand user-defined interchange experiments. Continue INEARP critical enabling technology development. Continue to expand library services listings to include model and algorithm coverage for all environmental domains. Continue a series of periodic end-to-end experiments/demonstrations to assess and validate the progress of technical development. Modify warfighting simulations as needed to react appropriately to environmental factors. Instrument the federation to derive appropriate metrics on cost/effort required to utilize existing environmental servers.

(U) Continue development of technologies and tools to support incorporation of authoritative representations of human and organizational behavior
into DoD simulations. Complete development of efforts in: Common Modeling Development Environment, and a Decision Model not based on optimization techniques. Continue development of Next Generation Synthetic Forces simulation capability.

(U) Complete Verification, Validation, and Accreditation (VV&A) studies: fidelity, specifications for reuse, and conceptual framework model coverage. Perform VV&A experiments regarding human and organizational behavior models to assess VV&A practices and methods.

(U) Conclude interoperability experiment with CMMS Toolset and Library; deploy the capability. Develop follow-on plan to build similar interoperability with other M&S programs that do not use the M&S Resource Repository (MSRR) as their primary repository. Develop ability to replace password encryption key. Develop ability to support true controlled vocabulary within MSRR, and across other, cooperating systems. Modify front end software based on user requirements, interoperability requirements, and software evolution requirements. Replace front end software to provide a broader knowledge management capability. Develop capability to record an audit trail of all transactions.

(U) Utilize the M&S Information Analysis Center for core-level M&S services.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) Develop and present new M&S education courses in support of Test & Evaluation and other areas of the acquisition community. Develop focused courses on M&S in support of Validation, Verification, and Accreditation, Logistics, Transportation, and Intelligence. Develop familiarization and implementation courses to educate Joint Warfare System (JWARS) and Joint Simulation System (JSIMS) users prior to Initial Operational Capability (IOC). Continue to work with the Experimentation community and develop new products to support them, as needed. Continue to develop and deliver the right mix of resident and on-line courses. Continue to incorporate M&S education courses into ADL. Incorporate DMSO M&S education courses in all service M&S specialty education and training. Continue incorporation of M&S education into Service academies, Service schools and Staff Colleges, both resident and ADL.

(U) Continue to select and cooperatively develop science and technology projects with high payoff to the Department`s M&S program.

(U) Continue to refine C4I-to-simulation requirements within the Defense Information Infrastructure (DII) Common Operating Environment (COE), to develop a comprehensive System Requirements Specification. Examine the re-use of interfaces developed in federations to C4I systems for other M&S domains (training, acquisition, and analysis).
($ 45.065 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	66.967	56.971	59.286	Continuing
Appropriated Value	68.684	62.971	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.441	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000	
c. Other	-2.068	-0.140	-14.221	
Current President's Budget	66.616	62.390	45.065	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding changes were the result of below threshold reprogrammings. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Joint Wargaming Simulation Management Office **PE 0603832D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE High Energy Laser Advanced Development **PE 0603924D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	16.005						Continuing	Continuing
	0.000	0.000	16.005							

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

U) This program element funds High Energy Laser (HEL) advanced technology development aimed at translating technology solutions for broadly defined military problems into demonstrated performance pay-offs, increased capabilities, increased supportability, or increased affordability. HEL weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, nearly unlimited magazine depth, low cost per kill, and reduced logistics requirements because of no need for stocks of munitions or warheads. As a result, HELs have the potential to perform a wide variety of military missions, including some that are impossible, or nearly so, for conventional weapons. These include interception of ballistic missiles in boost phase, defeat of high-speed, maneuvering anti-ship and anti-aircraft missiles, and the ultra-precision negation of targets in urban environments with no collateral damage. Research conducted under this program element develops and demonstrates the technology necessary to enable these and other HEL missions.

(U) This program element is part of an overall DOD initiative in HEL science and technology being conducted by the recently formed HEL Joint Technology Office (JTO). The goals of this HEL JTO funded research are to provide the technology to make HEL systems more effective and also to make them lighter, smaller, cheaper, and more easily supportable on the battlefield. In general, efforts funded under this program element are chosen for their potential to have major impact on multiple HEL systems and on multiple Service missions. As a result of this focus and of close coordination with the military departments and defense agencies, this program element complements other DOD HEL programs that are directed at more specific Service and agency needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Energy Laser Advanced Development **PE 0603924D8Z**

(U) A broad range of technology is addressed in key areas such as chemical lasers, solid-state lasers, beam control, optics, propagation, and free-electron lasers. Under this program element these technologies are integrated and tested in sub-scale demonstration systems or sub-systems. Research is conducted by Government laboratories and industry, often teamed together. The program element funds integrated theoretical, computational, and experimental investigations. These integrated investigations are structured to convincingly demonstrate the piercing of technology barriers that currently prevent HELs from being fielded as viable weapon systems. In addition, they are structured to permit rapid technology transition. As results become available, DOD will transmit them to appropriate military-department, defense-agency, and industry programs for technology transition, where appropriate.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Energy Laser Advanced Development **PE 0603924D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	0.000	0.000	16.005						Continuing	Continuing
blank project/1	0.000	0.000	16.005							

(U) Project Number and Title:

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Accomplishments:

(U) None, this initiative is new as of FY 2002.

(U) FY 2002 Plans:

(U) Pursuant to Congressional direction the DOD is developing a comprehensive, prioritized investment plan for HEL science and technology. This investment plan is being developed by the HEL JTO, in coordination with the military departments and the defense agencies. The plan, which will be completed by the end of FY01, will form the basis for the work to be conducted under this program element in FY02 and beyond, as well as the work to be conducted under companion basic-research and applied-research elements. Although the plan is not yet completed, the broad outlines of plan are becoming clear. Efforts to be included in the HEL advanced technology development funded by this program element will largely involve the extension or combination of particularly successful efforts funded under the HEL applied research program in FY01. It is anticipated that efforts under this program element will include one or more of the following:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Energy Laser Advanced Development **PE 0603924D8Z**

- Solid-state-laser demonstration. Assemble successful pieces from individual applied-research projects (e.g., reliable pump diode lasers, diode-laser drivers, thin-disk amplifiers, phase-conjugate mirrors, mist cooling) into a demonstration sub-system scalable to weapons power levels.
- Free-electron-laser (FEL) demonstration. Begin to develop a scalable FEL that can be operated on a military platform (e.g., a ship).
- Tactical beam-control demonstration. Using successful pieces from individual applied-research projects (e.g., deformable mirrors, wavefront sensors, advanced tracking and compensation algorithms) begin to develop a fieldable, sub-scale tactical beam-control system.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** High Energy Laser Advanced Development **PE 0603924D8Z**

(U) B. Program Change Summary	**FY 2000**	**FY 2001**	**FY 2002**						**Total Cost**
Previous President's Budget Submit	0.000	0.000	0.000						
Appropriated Value	0.000	0.000	0.000						Continuing
Adjustments to Appropriated Value									
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000						
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000						
c. Other	0.000	0.000	16.005						
Current President's Budget	0.000	0.000	16.005						Continuing

Change Summary Explanation

(U) **Funding**:

(U) **Schedule**:

(U) **Technical**:

(U) **C. Other Program Funding Summary Cost**

(U) **D. Acquisition Strategy**:

(U) **E. Schedule Profile**:

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE JUNE 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3							R-1 ITEM NOMENCLATURE Nuclear Matters **PE 0605160D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.442	1.470	1.781						Continuing	Continuing
Nuclear Matters/P476	1.442	1.470	1.781						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) The U.S. nuclear deterrent posture is the most visible and critical element of how U.S. military capabilities can be used to deter aggression and coercion. Therefore, nuclear weapons must receive special consideration within the Office of the Secretary of Defense because of their political and military importance, destructive power, and the potential consequences of an accident or unauthorized act. Consequently, senior level officials place the highest attention and priority to actioning nuclear weapons issues. The Nuclear Matters Program provides technical assessments and policy recommendations to the Under Secretary of Defense for Acquisition, Technology and Logistics and senior OSD leadership on complex and demanding issues that underpin our National Strategic Policy of nuclear deterence and especially those pertaining to the sustainment of the nuclear weapons stockpile. The Office of the Deputy Assistant Secretary for Nuclear Matters executes actions in collaboration and coordination with the National Security Council, Office of the Undersecretary of Defense for Policy, the Joint Staff, the Military Services, U.S. Strategic Command, U.S European Command, the Department of Energy and the National Nuclear Security Administration, the Congress, NATO, and foreign governments to provide guidance for - and oversight of - a wide variety of nuclear weapons activities. For these activities, the program provides analysis and assessments of issues associated with the stockpile size and composition, safety, reliability, security, use control, survivability, transportation, command and control, maintenance, storage, emergency response, and sustainability of the enduring stockpile.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.442	1.470	1.781						Continuing	Continuing
Nuclear Matters/P476	1.442	1.470	1.781						Continuing	Continuing

(U) Project Number and Title: P476 Nuclear Matters

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

U) Recurring Obligations: Performed assessments that provided the technical and policy basis for the successful preparation and submittal of the annual Requirements and Planning Document for the Secretaries of Defense and Energy, the annual Nuclear Weapons Stockpile Memorandum to the President, the Nuclear Weapons Council (NWC) Chairman`s Annual Report to Congress, the DoD-DOE Annual Surety Report to the President, and the Annual Certification Report to the President. These products provided the basis for technical policy recommendations to the President, Secretary of Defense, Secretary of Energy, and Chairman of the NWC on key nuclear weapon issues. Sucessfully prepared and conducted inter-departmental coordination and sent the annual Nuclear Weapons Deployment Request to the President and the Annual Performance Report to the NSC. Coordinated Facilitated the activities of senior level groups, such as the Congressionally directed Panel to Assess the Safety, Reliability, and Security of the United States Nuclear Stockpile. Continued to act as the OSD sponsor for the Joint Advisory Committee on Nuclear Weapons Surety (JAC) and executed a renewal of its charter. ($ 0.660 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

(U) Nuclear Weapons Council (NWC) Support: Managed the operations of the Joint DoD-DOE Nuclear Weapons Council (NWC) and the NWC Standing and Safety Committee and the Nuclear Weapons Requirements Planning Groups through the most intense activity period of their existence. Conducted analyses to identify technical issues which then provided the basis for NWC decisions on the evolution of the nuclear weapons complex and infrastructure. Developed and distributed Nuclear Weapons Council Handbook. Developed NWC Revitalization Report and provided to Congress in accordance with FY2000 Defense Authorization Act. Developed and promulgated the NWC Procedural Guideline for the Phase 6.X Process delineating NWC, DoD and DOE roles and functions for nuclear weapon refurbishment activities. ($ 0.400 million)

(U) Maintaining the Infrastructure for the Deterrent: Evaluated the DOE 30-Day Review of the Stockpile Stewardship Program. Performed analyses on topics for sustaining nuclear weapons safety, use control, survivability, certification, transportation, and reliability. These efforts supported DoD oversight of DOE stockpile stewardship activities, such as nuclear weapon sustainment and revalidation, tritium production technology issues and infrastructure requirements, nuclear weapon life extension, and stockpile stewardship and maintenance. Sponsored JAC assessment on Joint DoD/DOE Requirements for Warhead Refurbishment. Developed Electromagnetic Pulse (EMP) Report in response to FY1999 National Defense Authorization Act. Updated emergency response Go Kit and conducted accident response staff exercises. Executed MOA to ensure availability of health physics expertise in the event of a nuclear accident. Sponsored Defense Science Board study on Nuclear Simulation that provided recommendations on operational, research and management aspects of Defense Threat Reduction Agency nuclear simulation program. Developed Nuclear Skills Retention Plan in response to FY2000 National Defense Authorization Act. Performed OSD coordination on the DOE Stockpile Stewardship Plan for nuclear weapons sustainment. Provided OSD oversight for the development of the Nuclear Mission Management Plan (NMMP). Initiated Development of a Nuclear Weapons Life Cycle Handbook to sustain core expertise. Initiated actions to update DoD Directive 3150.1, Joint Nuclear Weapons Development Studies and Engineering Projects and DoD Instruction 5030.55, Joint AEC-DoD Nuclear Weapons Development Procedures. ($ 0.513 million)

(U) Policy Support and Guidance for International Obligations: Oversight and guidance was provided to activities and organizations, such as the NATO High Level Group, the Joint Theater Surety Management Group, and Congressionally approved technical exchanges with foreign nations. In particular conducted meetings in accordance with the Agreement between the Government of the United States of America and the Government of the Russian Federation on the Exchange of Technical Information in the Field of Nuclear Warhead Safety and Security also known as the Warhead Safety and Security Exchange Agreement (WSSX). Conducted

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	R-1 ITEM NOMENCLATURE Nuclear Matters **PE 0605160D8Z**

annual U.S./U.K. bi-lateral STOCKTAKE activity. Conducted U.S./France technology exchanges for developing mutual understanding of safety and security issues for nuclear weapons for ($ 0.169 million)

(U) FY 2001 Plans:

(U) Recurring Obligations: Analyses and assessments will provide basis for preparation of the annual Nuclear Weapons Stockpile Memorandum to the President, the Requirements and Planning Document, the Nuclear Weapons Council (NWC) Chairman`s Annual Report to Congress, the DoD-DOE Annual Surety Report to the President, and the Annual Certification Report to the President. These products will provide the basis for technical policy recommendations to the President, Secretary of Defense, Secretary of Energy, and Chairman of the NWC on key nuclear weapon issues. Analyses will be produced in preparation for the annual Nuclear Weapons Deployment Request to the President. The final year of the Congressionally directed Panel to Assess the Safety, Reliability, and Security of the United States Nuclear Stockpile will be facilitated. Continue as the OSD sponsor for the Joint Advisory Committee on Nuclear Weapons Surety (JAC). ($ 0.560 million)

(U)Nuclear Weapons Council : Manage the operations of the Joint DoD-DOE Nuclear Weapons Council (NWC) and the NWC Standing and Safety Committee and the Nuclear Weapons Requirements Planning Groups. Analyses and assessments on technical issues will be produced for the NWC members and staff concerning the evolution of the nuclear weapons complex and infrastructure. These analyses will facilitate decisions on the refurbishment of specific weapon systems and develop agenda items for the NWC. Update the NWC Procedural Guideline for the Phase 6.X Process delineating NWC, DoD and DOE roles and functions for nuclear weapon refurbishment activities. ($ 0.320 million)

(U) DoD-NNSA Nuclear Weapons Requirements Process: Provide for contractor Requirements Team to implement the joint DoD-NNSA Requirements Process to integrate and prioritize the requirements of both DoD and NNSA. Process includes the development and maintenance of a requirements database, quantities and schedules, the conduct of tradeoff assessments, and the development of a joint DoD-DOE/NNSA Prioritized Requirements Delivery Plan. A re-programming covering a portion of the yearly cost is anticipated for FY01 ($0.000 million).

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

(U) Maintaining the Deterrent Infrastructure: Analyses will be provided on topics for sustaining nuclear weapons safety, use control, survivability, emergency response, certification, transportation, and reliability. These efforts support DoD oversight of DOE stockpile stewardship activities, such as nuclear weapon sustainment and revalidation, technology issues and infrastructure requirements, nuclear weapon life extension, and stockpile stewardship and maintenance. Provide OSD oversight for the development of the second edition of the Nuclear Mission Management Plan (NMMP). Sponsor JAC assessment on DoD/DOE Physical Security of Nuclear Weapons. Conduct accident response staff exercises. Initiate update of DoD-DOE nuclear weapon related MOAs/MOUs with emphasis on the 1953 Agreement for the Development, Production, and Standardization of Atomic Weapons. Publish Nuclear Weapons Life Cycle Handbook to sustain core expertise. Complete and publish update to DoD Directive 3150.1, Joint Nuclear Weapons Development Studies and Engineering Projects and DoD Instruction 5030.55, Joint AEC-DoD Nuclear Weapons Development Procedures. ($ 0.421 million)

(U) Policy and Guidance for International Obligations: Oversight and guidance will be provided to activities and organizations, such as the NATO High Level Group, the Joint Theater Surety Management Group, and Congressionally approved technical exchanges with foreign nations such as WSSX and STOCKTAKE. Visit NATO nuclear capable units and report on status to raise awareness of surety issues to NATO. Plan exercises for developing mutual understanding of issues for the safety and security of nuclear weapons for U.S./France technology exchanges**.** ($ 0.169 million)

(U) FY 2002 Plans:

(U) Recurring Obligations: Analyses and assessments will provide basis for preparation of the annual Nuclear Weapons Stockpile Memorandum to the President, the Requirements and Planning Document, the Nuclear Weapons Council (NWC) Chairman`s Annual Report to Congress, the DoD-DOE Annual Surety Report to the President, and the Annual Certification Report to the President. These products will provide the basis for technical policy recommendations to the President, Secretary of Defense, Secretary of Energy, and Chairman of the NWC on key nuclear weapon issues. Analyses will be produced in preparation for the annual Nuclear Weapons Deployment Request to the President. Continue as the OSD sponsor for the Joint Advisory Committee on Nuclear Weapons Surety (JAC). ($ 0.560 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

(U) Nuclear Weapons Council: Manage the operations of the Joint DoD-DOE Nuclear Weapons Council (NWC) and the NWC Standing and Safety Committee and the Nuclear Weapons Requirements Planning Groups. Analyses and assessments on technical issues will be produced for the NWC members and staff concerning the evolution of the nuclear weapons complex and infrastructure. These analyses will facilitate decisions on the refurbishment of specific weapon systems and the development of agenda items for the NWC. ($ 0.322 million)

(U) DoD-NNSA Nuclear Weapons Requirements Process: Provide for contractor Requirements Team to implement the joint DoD-NNSA Requirements Process to integrate and prioritize the requirements of both DoD and NNSA. Process includes the development and maintenance of a requirements database, quantities and schedules, the conduct of tradeoff assessments, and the development of a joint DoD-DOE/NNSA Prioritized Requirements Delivery Plan. To meet the $0.600 million yearly funding requirement, a reprogramming of an additional $0.300 million is necessary for FY2002 per Memorandum, DDR&E, Subject: Research & Development (R&D) Funding Transfer, December 12, 2000. ($0.300 million).

(U) Maintaining the Deterrent Infrastructure: Manage implementation of Presidential initiatives on stockpile composition and quantities. Perform analyses on issues for sustaining nuclear weapons safety, use control, survivability, certification, transportation, and reliability. These efforts support DoD oversight of DOE stockpile stewardship activities, such as nuclear weapon sustainment and revalidation, infrastructure requirements, nuclear weapon life extension, and stockpile stewardship and maintenance Update handbooks on Nuclear Weapons Surety and Stockpile Management Information. Complete update of the 1953 Agreement for the Development, Production, and Standardization of Atomic Weapons. ($ 0.430 million)

(U) Policy and Guidance for International Obligations: Oversight and guidance will be provided to activities and organizations, such as the NATO High Level Group, the Joint Theater Surety Management Group, and Congressionally approved technical exchanges with foreign nations such as WSSX and STOCKTAKE. Visit NATO nuclear capable units and report on status to raise awareness of surety issues to NATO. Plan exercises for developing mutual understanding of issues for the safety and security of nuclear weapons for U.S./France technology exchanges. Initiate update of DoD Directive 5030.14 to affirm responsibilities of Joint Atomic Information Exchange Group (JAIEG) ($ 0.169 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**FY2003**	**FY2004**	**FY2005**	**Total Cost**
Previous President's Budget Submit	1.486	1.473	1.471				Continuing
Appropriated Value		1.483					Continuing
Adjustments to Appropriated Value							
a. Congressionally Directed Undistributed Reduction	-0.044	-0.013	0.000				
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	0.000	0.000				
c. Other	0.000	0.000	0.310				
Current President's Budget	1.442	1.470	1.781				Continuing

Change Summary Explanation

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE JUNE 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 3	**R-1 ITEM NOMENCLATURE** Nuclear Matters **PE 0605160D8Z**

(U) Funding: When the Nuclear Matters funding line was created in FY1997 for the Office of the Deputy Assistant Secretary for Nuclear Matters within the Office of Assistant Secretary of Defense for Nuclear and Chemical and Biological Defense Programs (ATSD(NCB), it was placed for administrative purposes under a Counterproliferation Program program element already existing under the ATSD(NCB). Through the Defense Reform Initiative (DRI), the Counterproliferation Program and its program element were moved to the Defense Threat Reduction Agency, while the Office of Nuclear Matters was moved to the Director, Defense Research and Engineering. As a result, funds for Nuclear Matters were transferred from PE0605160D8Z to PE0605160BR in FY1999. Under an agreement with Washington Headquarters Services, these funds were transferred to PE065160D8Z in OSD in FY2000 to continue the efforts of the Nuclear Matters Program. A mid-year reprogramming was accomplished in FY 2000 to initiate the DoD-NNSA Nuclear Weapons Requirement Process. A re-programming of an additional resources for this effort is anticipated for FY01. Increases in FY 2002 were the result of programmatic adjustments and a reprogramming of an additional $0.300 million is still necessary for FY2002 per Memorandum, DDR&E, Subject: Research & Development (R&D) Funding Transfer, December 12, 2000.

(U) Schedule: N/A

(U) Technical: N/A

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RESEARCH, DEVELOPMENT, TEST & EVALUATION, DEFENSE-WIDE, BUDGET ACTIVITY 4					R-1 ITEM NOMENCLATURE PHYSICAL SECURITY EQUIPMENT PE 0603228D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY2002						Cost to Complete	Total Cost
Total PE Cost	25.589	25.866	33.543						CONTINUING	CONTINUING
HALT	0.527	0.976	0.000						N/A	
CROWS	0.100	0.350	0.280						N/A	
HVISS	0.200	0.460	3.500						CONTINUING	CONTINUING
PEWD II	0.300	0.500	1.369						CONTINUING	CONTINUING
ETF	0.200	1.850	2.500						CONTINUING	CONTINUING
Delay/Denial D/D	0.350	0.114	0.900						CONTINUING	CONTINUING
Product Development/Qualification	0.454	0.960	0.925						CONTINUING	CONTINUING
Advanced Technology Program	0.000	0.266	0.948						CONTINUING	CONTINUING
Product Testing & Support	0.000	0.634	0.975						CONTINUING	CONTINUING
COTS	3.500	4.091	3.873						CONTINUING	CONTINUING
Technology Base	2.564	3.500	5.384						CONTINUING	CONTINUING
WSA	1.794	0.000	0.000						N/A	
TASS	3.600	2.965	4.672						CONTINUING	CONTINUING
WSS	2.656	2.482	2.633						CONTINUING	CONTINUING
EDE	2.452	2.531	3.834						CONTINUING	CONTINUING
Locks, Safes, Vaults	1.492	1.187	1.750						CONTINUING	CONTINUING
MDARS-E	5.400	3.000	0.000						N/A	

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

A. Mission Description and Budget Item Justification. This program is a budget activity level 4 based on the demonstration/validation activities ongoing within the program. The purpose of this program is to develop physical security equipment (PSE) systems for all DoD components, to include Force Protection. This program supports the protection of tactical and nuclear weapons systems, DoD personnel and DoD facilities. Funding for critical RDT&E security improvements within service channels has fluctuated widely over the years and prompted the FY89 Congressionally directed consolidation of the Services and former Defense Special Weapons Agency (DSWA) / Defense Threat Reduction Agency (DTRA) PSE RDT&E funds into this single OSD controlled program element. The funds are used to provide PSE RDT&E for individual Service and Joint PSE requirements. The PSE program is organized so that an ongoing DoD-coordinated Joint Action Group, consisting of Army, Navy, Air Force, and Defense Threat Reduction Agency (DTRA) representatives monitors, directs and prioritizes potential and existing PSE programs. With few exceptions, each Service sponsors RDT&E efforts for technologies and programs, which have multi-service applications. The funds are also employed to evaluate exploratory development of Physical Security Equipment. This program element supports the Army's advanced engineering development of Interior Detection, Exterior Detection, Security Lighting, Security Barriers and Security Display Units. In a like manner, the program element also supports the Air Force's PSE RDT&E effort in the area of Exterior Detection/Surveillance, Entry Control, Delay/Denial, Tactical Systems and Airborne Intrusion. Finally, the program supports Navy RDT&E efforts in the areas of Waterside Security, Explosive Detection, and improved technology for Locks, Safes and Vaults. Beginning with FY 1997, this PE includes funding for Force Protection Commercial-Off-The-Shelf (FP COTS) evaluation and testing, which has received focus since the 1996 Khobar Towers terrorist bombing incident. The FP COTS testing applies to all available technologies, which are considered effective for DoD use.

(U) FY 2000 Accomplishments

HINDER ADVERSARIES WITH LESS THAN LETHAL TECHNOLOGY (HALT) (0.527 million)

- Awarded EMD contract to develop a non-lethal eye-safe laser for all ranges, tactically rugged, and capable of operating over full military temperature ranges.
- Obtained Legal and Medical approval.

COMMON REMOTELY OPERATED WEAPON SYSTEM (CROWS) (0.100 million)

- Prepared ORD, Specification, and SOW Development for EMD award.
- Performed proof of concept demonstration and risk reduction activities.

HIGH VALUE ITEM SECURITY SYSTEM (HVISS) PHASE II Radio Frequency Identification (RFID) (0.200 million)

- Monitored Applied Research Efforts.
- Continued preparation of Concept Formulation Package.
- Updated Project Plan.

PLATOON EARLY WARNING DEVICE II (PEWD II) (0.300 million)

- Completed market investigation/TASS determination.
- Continued evaluation of candidate Non-Developmental Items (NDI)/COTS Systems.
- Initiated Joint Army/Air Force Product Improvement effort.

ELECTRONIC TRIP FLARE (ETF) (0.200 million)

- Awarded Broad Agency Announcement (BAA) Contract to Ocean Atmospheric Science, Inc. to develop Brassboard prototype.
- Monitored Technical Support Working Group (TSWG) prototype development effort.

DELAY/DENIAL (D/D) DEVELOPMENT/QUALIFICATION (0.350 million)

- Worked with the Joint Non-lethal Weapons Directorate (JNLWD) to develop future plans for active denial technology and a plan for public acceptance of eye-safe laser weapons.
- Developed several transition plans for bringing promising laboratory programs into the acquisition community.

PRODUCT DEVELOPMENT/QUALIFICATION (0.454 million)

- Performed the research and planning for an out-of-cycle Foreign Comparative Test (FCT) Program. Program was approved--funding received and is being worked. Other FCT funded programs are in various stages and being worked.
- Completed three CWG tests and are working six more.
- Planned for and put on contract a new program to develop a long-range, all weather, 360 degree sensor.

(U) FY 2001 Plans

HINDER ADVERSARIES WITH LESS THAN LETHAL TECHNOLOGY (HALT) (0.976 million)

- Complete EMD Phase.

DELAY/DENIAL (D/D) DEVELOPMENT/QUALIFICATION (0.114 million)

- Continue to manage D/D product developments.
- Continue to evaluate D/D COTS products.
- Continue to recommend new D/D technologies.

- Develop new/better methods to delay intruders intent on entering secured external areas.

COMMON REMOTELY OPERATED WEAPON SYSTEM (CROWS) (0.350 million)
- Continue FY00 efforts for proof of concept demonstration leading up to EMD award, Dec 00.
- Insert AF requirements into this Army effort. Ensure AF requirements are being met.

ADVANCED TECHNOLOGY PROGRAM (0.266 million)
- Identify technological advances at DoD, DoE, University Labs, DARPA programs, etc., with PSE utility.
- Respond to and research FP Battlelab requests for information.
- Prepare operational systems improvement plans. Develop technology roadmap. Update system architecture.

PRODUCT TESTING AND SUPPORT (0.634 million)
- Support all testing of PSE products (COTS, NDI, Developmental) and systems testing.
- Provide Logistical and Cost Estimating support to on-going programs.

PRODUCT DEVELOPMENT/QUALIFICATION (0.960 million)
- Continue to manage sensor, access control, and assessment product developments.
- Continue to evaluate sensor, access control, and assessment COTS products.
- Continue to recommend new sensor, access control, and assessment technologies.

HIGH VALUE ITEM SECURITY SYSTEM (HVISS) PHASE II (RFID) (0.460 million)
- Evaluate Applied Research effort to determine acquisition approach.
- Complete Concept Formulation Package (CFP)

ELECTRONIC TRIP FLARE (ETF) (1.850 million)
- Initiate Concept Formulation Package (CFP)
- Monitor Technical Support Working Group prototype efforts.
- Conduct prototype (DT) testing/integration effort.

PLATOON EARLY WARNING DEVICE II (PEWD II) (0.500 million)
- Monitor EER prototype development effort.
- Conduct Critical Design Review (CDR), Phase I.
- Conduct CDR, Phase II.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

(U) FY 2002 Plans

DELAY/DENIAL (D/D) DEVELOPMENT/QUALIFICATION (0.900 million)
- Continue to manage D/D product developments.
- Continue to evaluate D/D COTS products.
- Continue to recommend new D/D technologies.

COMMON REMOTELY OPERATED WEAPON SYSTEM (CROWS) (0.280 million)
- Continue with EMD Phase by providing Engineering, Logistics, and Cost Estimating support.

ADVANCED TECHNOLOGY PROGRAM (0.948 million)
- Continue to identify technological advances at DoD, DoE, University Labs, DARPA programs, etc., with PSE utility.
- Continue to respond/research FP Battlelab requests for information.
- Continue to prepare operational systems improvement plans. Develop technology roadmap. Update system architecture.

PRODUCT TESTING AND SUPPORT (0.975 million)
- Continue to support all testing of PSE products (COTS, NDI, Developmental) and systems testing.
- Continue to provide Logistical and Cost Estimating support to on-going programs.

PRODUCT DEVELOPMENT/QUALIFICATION (0.925 million)
- Continue to manage sensor, access control, and assessment product developments.
- Continue to evaluate sensor, access control, and assessment COTS products.
- Continue to recommend new sensor, access control, and assessment technologies.

HIGH-VALUE ITEM SECURITY SYSTEM (HVISS) PHASE II (RFID) (3.500 million)
- Award Broad Agency Announcement (BAA) Contract.
- Monitor TSWG prototype development effort.
- Conduct Technical Feasibility Testing (TFT).
- Conduct MS A (IPR).

ELECTRONIC TRIP FLARE (ETF) (2.500 million)
- Transition Technical Support Working Group (TSWG) effort to Army.
- Complete Concept Formulation Package (CFP).
- Conduct MS A/B In-Process Review.

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PLATOON EARLY WARNING DEVICE II (PEWD II) (1.369 million)

- Conduct Technical Feasibility Testing (TFT)
- Field 69 units to Brigade Combat Team (BCT).
- Conduct MS C IPR.

B. Program Change Summary ($ million)

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	37.107	36.201	35.284	Cont
Appropriated Value	26.107	26.107		
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction				
b. Congressionally Directed Undistributed Reduction		(0.183)		
c. OSD Directed Program Reduction/Increase	(0.518)	(0.058)	(1.741)	
Current Budget Submit/President's Budget	25.589	25.866	33.543	Cont

Change Summary Explanation:

Funding: Adjustments reflect inflation savings, below threshhold reprogrammings and the Government-wide rescission

Schedule: N/A

Technical: N/A

C. Other Program Funding Summary

Cost		FY2000	FY2001	FY2002
Procurement Line P-1 No(s)	- USAF	1.000	1.000	1.000
Milcon Project No(s)	- N/A			
Related RDT&E:	- N/A			

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

D. Acquisition Strategy:

E. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
HALT	MS II		
CROWS		MS II	
HVISS			MS A
PEWD II			MS C
ETF			MS B
Engineering Milestones			
N/A			

	FY2000	FY2001	FY2002
T&E Milestones			
HALT		QT&E	
HVISS			TFT
PEWD II			TFT
ETF		DT	
Contract Milestones			
HVISS			BAA Awd
ETF	BAA Awd		

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0603228D8Z		PROJECT NAME AND NUMBER Commercial off the Shelf (COTS)					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY2007	Cost to Complete	Total Cost
COTS	3.500	4.091	3.873						Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The DoD Force Protection Commercial-Off-The-Shelf (COTS) evaluation and integration project identifies and evaluates commercial systems and equipment that have potential for solving critical Force Protection problems. Equipment is tested in laboratory and operational settings to determine its suitability for a wide range of Force Protection applications. These include applications in nuclear, aircraft flight line, personnel facilities and resource protection security. Products that are identified as having military value are made available for use by incorporating them into existing or new programs. Current emphasis is on products that provide day/night all-weather detection/surveillance, sniper location, non-lethal defensive capability, barriers, large vehicle explosives detection, water-side security systems, and personal and tactical security systems. Planned testing may be accomplished at the established DoD Test Facility at Eglin AFB, FL or another appropriate/necessary facility.

(U) FY 2000 Accomplishments

- Developed a new system capability through the integration of Commercial-Off-The Shelf (COTS) products.
- Tested/demonstrated new capability at Joint Expeditionary Force Experiment (JEFX)’99.
- Performed scheduled FY 2000 evaluations and test of selected COTS equipment/systems.
- Published appropriate reports.
- Updated the User’s Guide of Commercially available Non-Developmental Items for Force Protection users.

(U) FY 2001 Plans

- Procure and deliver COTS Force Protection Equipment in support of DoD urgent and compelling requirements for evaluation and testing.
- Update methodology and publish evaluation and test schedule for FY 2001.
- Perform scheduled FY 2001 test and evaluations of selected COTS equipment/systems.
- Conduct Force Protection Equipment Demonstration III 8-10 May 2001.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2002 Plans

- Procure and deliver COTS Force Protection Equipment in support of DoD urgent and compelling requirements for evaluation and testing.
- Publish appropriate reports.
- Update the User's Guide of Commercially available Non Developmental Items for Force Protection users.
- Update methodology and publish test and evaluation schedule for FY 2002.

B. Other Program Funding Summary

C. Acquisition Strategy: Identify available government contracts or commence action to competitively award delivery order contracts.

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603228D8Z	PROJECT NAME AND NUMBER TECHNOLOGY BASE	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Technology Base	2.564	3.500	5.384						Cont	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Defense Threat Reduction Agency (DTRA) is responsible for coordinating technology base efforts that feed into the advanced development projects within the Physical Security Equipment (PSE) Program. DTRA performs the exploratory development on technologies that are nominated and prioritized by the Services and the Physical Security Equipment Action Group (PSEAG). This annual process determines which technologies have potential to meet Service interests in fulfilling eventual Joint Service and Service-unique requirements.

(U) FY 2000 Accomplishments

- Completed and demonstrated prototype hardware for the improved laser diode, miniaturized radio frequency tags, acoustic detection and classification sensor, nuclear quadrupole resonance sensor, photo-neutron probe for the detection of explosives, tactical security sensor internetting system, an advanced user interface system, and the weather vulnerability assessment tool.
- Continued the detection on the move (exterior) project, security vehicle with acoustic guidance, and the fluorescence detection of explosives detection projects.
- Initiated the Video Forward Looking Infrared (FLIR) Imager, the Remote Detection Target Sensor, the Target Classifying Sensor, and the Blue Rose fiber optic cable sensor projects.

(U) FY 2001 Plans

- Complete and demonstrate the results of applied research and development for the detection on the move (exterior) project, the security vehicle with acoustic guidance project, and the fluorescence detection of explosives projects.
- Continue the Target Classifying Sensor Project, Blue Rose Fiber Optic Sensor Project and the Inspection AIDE Project which is a follow-on to the Photo Neutron Probe Project.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2002 Plans

- Initiate new projects for the Wireless Network Security Sensor; the Multi-Beam Antennae for Active Microwave and Passive Infrared Sensors; the TASS Miniature Acoustic/Seismic Sensor; the Compact Video Motion Detection Sensor; the Long Range Intelligent Infrared Fence; the Non-Lethal Swimmer Interdiction Device; and the Shoreline Intruder Detection System.
- Continue the Video FLIR Imager project; the Wireless Network Security Sensors project; the Force Protection Sensor Selector project; the Multi-Beam Antennae for Active Microwave and Passive Infrared Sensors project; the Remote Detection Target Sensor project; the Target Classifying Sensor project; the Blue Rose fiber optic cable sensor project; the Non-Lethal Swimmer Interdiction device project; and the Shoreline Intruder Detection System project.
- Initiate new projects as agreed upon with the Service sponsors and funding permits.

E. Other Program Funding Summary

F. Acquisition Strategy:

G. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0603228D8Z		PROJECT NAME AND NUMBER WEAPON STORAGE AREA (WSA)/AIR BASE SECURITY UPGRADES					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
WSA	1.794	0.000	0.000						N/A	N/A
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. Develop, test, and deploy equipment that will provide new capability, upgrade the existing capability, or reduce the sustainment cost of WSA/Air Base Security. This activity will be accomplished through the development, testing and employment of automatic access control equipment, command and control equipment, and intrusion detection and assessment equipment that permit the security of WSA/Air Base facilities. Test and deploy (as appropriate) Commercial-Off-The-Shelf (COTS) products.

(U) FY 2000 Accomplishments

- Developed a new system Force Protection Command and Control (FPC2) capability through the integration of Commercial-Off-The Shelf (COTS) products.
- Tested/demonstrated new Force Protection Command and Control (FPC2) capability at Joint Expeditionary Force Experiment (JEFX)'99.
- Assisted the Force Protection Battlelab with developing and proving the operational benefits of FPC2.
- Worked with the Battlelab to develop the follow-on Combat Support C2 System and the testing/demonstration of the new capability at the Joint Expeditionary Force Experiment (JEFX) 00.
- Awarded a contract to install a 2D Video Motion Detection (VMD) system at Altus AFB Flightline and temporarily install and evaluate a 3D VMD system.
- Began development of a new system architecture that takes advantage of advances in technology.
- Continued market research and testing of COTS security products.

(U) FY 2001 Plans

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- To more accurately reflect the needs of the Air Force in FY 2001 and beyond, this effort has been divided into multiple programs to evaluate, develop, test and purchase physical security equipment that support all facilities and flightlines. The efforts previously identified as only “WSA”, also have applications in other areas.

(U) FY 2002 Plans
N/A

B. Other Program Funding Summary

	2000	2001	2002	To Complete	Total Cost
Procurement	3.499	3.011	5.594	Cont	Cont

C. Acquisition Strategy: Identify available government contracts or commence action to competitively awarded delivery order contracts.

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
T&E Milestones			
Contract Milestones			
VMD		CA	

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0603228D8Z		PROJECT NAME AND NUMBER TACTICAL AUTOMATED SECURITY SYSTEM (TASS)					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
TASS	3.600	2.965	4.672						Cont	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Tactical Automated Security System (TASS), an Air Force funded procurement and DoD funded R&D program, is an ongoing effort to develop an integrated, portable, relocatable security system to provide Force Protection capability for personnel, dispersed assets, fixed base facilities and Air Base Ground Defense applications. The system includes remote sensing, alarm monitoring through fiber optic and wireless data communications, remote assessment through the use of day/night all weather Thermal Imagining and CCTV systems. The system employs a PC-based annunciator and relies on an internal power and recharging system.

(U) FY 2000 Accomplishments

- Conducted Follow-On Test and Evaluation (FOT&E) and corrected critical FOT&E deficiencies.
- Conducted testing of COTS technology to add capabilities to the TASS suite of products.
- Awarded and performed technology enhancement Engineering Change Proposals (ECP) to improve/provide new capabilities. These included the upgrade to the Data Communications system to meet US Army size and weight requirements, add an encryption capability, and add a GPS capability for team location functions. In addition, a major software upgrade was developed, tested, and fielded increasing capabilities to include auto-assessment.
- Downsized TASS footprint requirements to a level consistent with AEF (Aerospace Expeditionary Force) concepts.

(U) FY 2001 Plans

- Complete the upgrade to the data communications system to meet AF and ARMY requirements, to include reduced component size, added encryption capability, and GPS.
- Conduct testing of COTS technology to add capabilities to the TASS suite of products.
- Award and perform technology enhancement ECPs to improve/provide new capabilities. Included will be: (1) annunciator software upgrade IV that leverages current market technology to increase capability while decreasing procurement costs; (2) an upgrade of power system components including battery modules and solar panels; (3) develop new sensors to increase performance while decreasing NAR/FAR (Nuisance Alarm Rates/False Alarm Rates).

Exhibit R-2a, RDT&E Project Justification | Date: June 2001

- Conduct testing of COTS products to add capabilities to the TASS suite of products. This will include testing short-range thermal imagers and a new class hand-held thermal imager.

(U) FY 2002 Plans

- Conduct testing of COTS products to add capabilities to the TASS suite of products.
- Award and perform technology enhancement ECPs to improve/provide new capabilities. Included will be: (1) developing an upgraded assessment network that greatly increases the situational awareness of the operator; (2) the program will develop and incorporate sensor systems: (3) an upgrade to the annunciator software system to increase user capabilities for nuclear safeguarding applications; and (4) an upgrade to the system to provide for a tactical entry control capability.
- Continue the miniaturization efforts to produce a system that is small, lightweight, and durable.

B. Other Program Funding Summary

	2000	2001	2002	To Complete	Total Cost
Procurement	22.200	25.000	22.200	Cont	Cont

C. Acquisition Strategy: One (1) large, two (2) Small Business competitively awarded contracts with Technology enhancement delivery order available.

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
- FOT&E			
- P3I/COTS			
- P3I/ECPs			

Acquisition Milestones

Engineering Milestones

T&E Milestones

Contract Milestones

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603228D8Z	PROJECT NAME AND NUMBER WATERSIDE SECURITY SYSTEM (WSS)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
WSS	2.656	2.482	2.633						Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Space and Naval Warfare Center (SPAWARCEN), San Diego is the Center of Excellence for waterfront security. Responsibilities include fixed and transportable waterfront security systems, swimmer detection sonars, and commercial-off-the-shelf (COTS) equipment test and evaluation, which focuses on waterfront force protection. The program is under the sponsorship and direction of CNO (N34).

(U) FY 2000 Accomplishments

- Supported installation P3I of the WSS at operational sites.
- Tested sonar and thermal imager technologies at SUBASE Kings Bay, Bangor and NAVCENT.
- Established the Mike 5000 Pier test and integration facility and commenced the evaluation of COTS.
- Conducted testing of the Sea Threat Assessment and Response System.
- Conducted testing of the Diver Imaging system in coordination with DTRA.
- Worked closely with submarine community for the establishment of technology requirements.
- Initiated “knowledge management” initiatives to deliver information to the PSE community.

(U) FY 2001 Plans

- Manage the Waterside Security System and Shipboard Physical Security programs.
- Evaluate and test COTS technologies for the waterfront environment.
- Test and integrate WSS, which includes barriers and underwater assessment capabilities.
- Initiate RDT&E for the development of the new generation of swimmer detection sonar.
- Support installation WSS systems at operational sites.
- Coordinate Knowledge Management efforts with other DoD Services.

(U) FY 2002 Plans

- Evaluate, test, and integrate emerging technologies into the waterfront security program.
- Test and evaluate new sonar technology for swimmer detection.
- Evaluate and integrate swimmer assessment capabilities into the WSS.
- Investigate robotics for detection and assessment of hostile swimmers.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- Test swimmer detection technologies under the Foreign Comparative Testing Program.
- Support WSS at operational sites.
- Coordinate Knowledge Management efforts with other federal agencies (FAA, Energy, etc.).

B. Other Program Funding Summary

C. Acquisition Strategy

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDTE&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603228D8Z	PROJECT NAME AND NUMBER EXPLOSIVE DETECTION EQUIPMENT (EDE)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
EDE	2.452	2.531	3.834						Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The EDE Program's primary focus is to evaluate Commercial Off-the-Shelf (COTS) explosive detection products. Assessments of systems at Department of Defense (DoD) locations are a critical component of the effort, as is ensuring the results of such demonstrations or testing are readily available to the military services' decision-makers. Attempts to leverage previous independent testing and evaluation and supplementing other government investments in development of explosives screening systems is made. A limited amount of funding is earmarked for low-risk emerging technologies that may assist in increasing the likelihood of detecting improvised explosive devices, large vehicle bomb, etc.

(U) FY 2000 Accomplishments

- Conducted a Security Technology Demonstration of the American Science and Engineering Mobile Truck X-ray Wide-Eye, a large imaging system, at an operational naval activity in Southwest Asia (February-March 2000).
- Assessed the operation of the Quantum Magnetics QScan QR160, in a mail screening application, at an overseas DoD activity.
- Assembled a kit of low-cost vehicle inspection equipment for the visual screening of cars and truck.
- Updated the EDE catalog, a compilation of COTS product data.
- Established a web site at www.explosivedetection.nfesc.navy.com for a wide range of EDE related information.
- Hosted an EDE Symposium in January 2000 which drew attendees from academia, the private sector and other government agencies.
- Identified near-term COTS solutions to explosive detection requirements, e. g., Camp Able Sentry and Camp Bondsteel.
- Supported the Navy's Knowledge Management initiative.

(U) FY 2001 Plans

- Engaged the Federal Aviation Administration to select suitable EDE for use in mailroom screening.
- Perform comparative evaluations of various COTS equipment/systems beginning with hand-held trace detectors.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- Provide low-cost vehicle inspection kits to a number of DoD organizations for deployment and evaluation.
- Develop logistic support data, to include the publication of Quick Reference Cards, for selected commercially-available products.
- Update and maintain the EDE web site.
- Continue/transition the development of a photoneutron-based probe that enhances the capabilities of high-energy radiographic inspection for explosives

.

(U) FY 2002 Plans

- Perform comparative evaluations of various COTS equipment/systems.
- Develop logistic support data, to include the publication of Quick Reference Cards, for selected commercially-available products.
- Update and maintain the EDE web site.

B. Other Program Funding Summary

C. Acquisition Strategy: Current approach is an Abbreviated Acquisition Program. Most purchases or procurement of equipment will be made at the local or activity level.

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603228D8Z	PROJECT NAME AND NUMBER DoD LOCKS, SAFES, VAULTS	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
LOCKS	1.492	1.187	1.750						Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The DoD Lock, Safes and Vaults Program identifies, tests and evaluates commercial hardware for suitability and compliance with security requirements, and tools and technology that may reduce the delay time afforded by present day security systems mandated by current regulations. The program also provides users with up-to-date security technology information by means of CD-ROM distribution. Other valuable services provided include testing security seals, analysis of alternative high security locking systems for Arms, Ammunition & Explosive (AA&E) applications, and evaluation of entry systems for “locked out” high security magazine doors.

(U) FY 2000 Accomplishments

- Finalized and received approval for National Security Information (NSI) Destruction CD-ROM.
- Installed 10 Internal Locking Device (ILD) systems and trained operators at Army ammunition storage facility Miesau, Germany.
- Conducted ILD forced entry test.
- Tested commercially available attack tools.
- Completed update and published High Security Padlock Technical Data Sheet (TDS).
- Developed and implemented online hotline tracking software and user guide.
- Finalized development, tested, and met approval requirements for alternative lightweight concrete for Navy High security magazine door.

(U) FY 2001 Plans

- Update and publish guide specifications for security equipment (as needed).
- Conduct a Security Seals Symposium.
- Identify and approve lead seal alternatives.
- Conduct evaluation and specify security seals for computer systems and combination locks.
- Identify and evaluate door systems used to protect AA&E.
- Incorporate design recommendations/enhancements into ILD User Data Package.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2002 Plans

- Update and publish guide specifications for security equipment (as needed).
- Identify requirements for label seals and develop and publish specification.
- Test and evaluate commercially available forced entry attack tools.
- Develop and publish cost effective methods to upgrade attack resistance of AA&E magazine door systems.
- Develop user training for security seals.

B. Other Program Funding Summary

C. Acquisition Strategy

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603228D8Z	PROJECT NAME AND NUMBER MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM – EXTERIOR (MDARS-E)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
MDARS-E	5.400	3.000	0.000						N/A	
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Mobile Detection Assessment Response System – Exterior (MDARS-E) will provide unmanned, roving security patrols among buildings and around the perimeter of large, fixed installations to include warehouses, large storage facilities and ammunition facilities. In support of security operations the system will manage inventories and track movement or disturbance of critical assets.

(U) FY 2000 Accomplishments

- Conducted Technical Feasibility Testing (TFT) of the complete system in a field environment.
- Conducted System Functional Review.
- Initiated documentation supporting MS I/II In Process Review (IPR).

(U) FY 2001 Plans

- Prepare Engineering & Manufacturing Development contract package and Request for Proposal
- Conduct MS I/II In Process Review (IPR).

(U) FY 2002 Plans

- Program successfully transitioned to Engineering & Manufacturing Development and 6.4 funding.

B. Other Program Funding Summary

C. Acquisition Strategy: Identify available government contracts or commence action to competitively award delivery order contracts.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

D. Schedule Profile:

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones		MS I/II	
Engineering Milestones			
T&E Milestones	TFT		
Contract Milestones			

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY		Program Element PE 0603228D8Z					MDARS-E					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development			2.800	0.800								
Ancilliary Hardware Development				0.300								
Systems Engineering			0.800	0.350								
Liscenses												
tooling												
GFE				0.150								
Award Fees												
Subtotal Product Development			3.600	1.600								
Remarks:												
Development Support			0.605	0.150								
Software Development			0.545									
Training Development				0.150								
Integrated Logistics Support			0.090									
Configuration Management			0.023	0.050								
Technical Data			0.337	0.050								
GFE												
Subtotal Support			1.600	0.400								
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE		Program Element					MDARS-E					
BUDGET ACTIVITY 0		PE 0603228D8Z										
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
User Appraisal			0.100	0.200								
Subtotal T&E			0.100	0.200								
Remarks:												
Contractor Engineering Support				0.456								
Government Engineering Support				0.278								
Program Management Support			0.006									
Program Management Personnel			0.072									
Travel			0.022	0.066								
Labor (Research Personnel)												
Miscellaneous												
Subtotal Management			0.100	0.800								
Remarks:												
Total Cost			5.400	3.000								
Remarks:												

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RESEARCH, DEVELOPMENT, TEST & EVALUATION, DEFENSE-WIDE, BUDGET ACTIVITY 4					R-1 ITEM NOMENCLATURE JOINT ROBOTICS PROGRAM PE 0603709D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total PE Cost	17.448	13.667	11.302						CONTINUING	CONTINUING
JAUGS	0.200	0.600	0.800						CONTINUING	CONTINUING
BUGS	0.700	0.900	0.900						CONTINUING	CONTINUING
FTUV	1.510	3.167	0.000						CONTINUING	CONTINUING
GLADIATOR	0.000	0.000	1.000							
MPRS	0.000	0.000	1.402							
Technology Base	8.038	0.000	0.000						N/A	CONTINUING
Mobility Enhancements	3.000	5.200	3.000						CONTINUING	CONTINUING
RACS	4.000	3.800	4.200						CONTINUING	CONTINUING

A. Mission Description and Budget Item Justification. This program is a budget activity level 4 based on the demonstration/validation activities ongoing within the program. This PE was established in response to Congressional guidance to consolidate DoD robotic programs on unmanned ground systems and related robotic technologies in order to increase focus of the Services' robotic programs on operational requirements. The program will demonstrate maturity of robotics technologies for their application to the formal acquisition process of land systems and subsystems. Emphasis is on the development of robotic technologies that: are amenable to multi-service applications; provide capability in high hazard environments; provide improved battlefield efficiency using supervised autonomous operational capability; reduce or enhance force manpower and support; and are affordable. This PE consolidates the DoD robotics program for Unmanned Ground Vehicles (UGV) into two activities: (1) advancement of UGV concepts into Advanced Development (AD) acquisition programs and (2) the enhancement and exploitation of critical robotic technologies for today's and future UGV acquisition requirements. Categories under this PE are: (1) the Basic Unexploded Ordnance System (BUGS) - a Joint Service EOD effort to locate and dispose of surface UXO; (2) the Robotics for Agile Combat Support (RACS) - a USAF effort to develop a robotic/autonomous vehicle capability for Force Protection and Active Range Clearance (ARC). RACS platforms include the following: All-purpose Remote Transport System (ARTS), Subsurface Ordnance Characterization System (SOCS), and Automated Ordnance Excavator (AOE). This technology can also be applied to formerly used defense sites for cleanup/disposal. (3) The Mobility Enhancements program is a research and development program aimed at improving the mobility of small, man portable unmanned vehicle systems in support of military police missions. (4) The Family of Tactical Unmanned Vehicles (FTUV) is a joint Army/Marine Corps effort to provide commanders a family of reconnaissance, surveillance and target acquisition UGV's that are properly sized to operate in a variety of tactical situations. Requirements are emerging for small and medium unmanned systems that improve warfighters' situational awareness in scout, mechanized and infantry operations in urban terrain. (5) Man Portable Robotic Systems (MPRS) – is an effort to develop smaller (10-40 lb. Class) UGVs as part of the FTUV program.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

(6) The Joint Architecture for Unmanned Ground Systems (JAUGS) is an approach to standardizing protocols, and software component interfaces of all anticipated DoD unmanned systems. (7) Gladiator is an effort to develop a light (≤ 1000 lbs) unmanned system for the USMC to conduct surveillance, reconnaissance and other selected missions.

(U) FY 2000 Accomplishments

JOINT ARCHITECTURE FOR UNMANNED GROUND SYSTEMS (JAUGS) DEVELOPMENT (0.200 million)

- Continued to update JAUGS based on technology improvements, Joint Technical Architecture (JTA) standards established by DoD, and mission requirements.
- Coordinated JAUGS activities closely with 4D/RCS and Demo III development efforts.
- Continued validation process on the JAUGS.
- Updated and improved documentation that described the UGV domain and set performance specifications.
- Incorporated JAUGS into Standardized Robotic System (SRS) contract (Previously Vehicle Teleoperation (VT)).
- Conducted configuration management functions and activities.

BASIC UXO GATHERING SYSTEM (BUGS) (0.700 million)

- Implemented cooperative behaviors, tested and demonstrated five vehicle systems for the random-search system.
- Completed initial design, test and demonstrated five-vehicle systems for the directed-search system.

U) FY 2001 Plans

JOINT ARCHITECTURE FOR UNMANNED GROUND SYSTEMS (JAUGS) DEVELOPMENT (0.600 million)

- Evolve, refine, and update to achieve greater autonomous mobility, weapons, recon and manipulation. Inputs will be received primarily from user appraisals, fielded systems feedback, and industry/Tech Base development efforts.
- Implement JAUGS throughout the Joint Robotics Program.
- Place JAUGS under configuration control.

BASIC UXO GATHERING SYSTEM (BUGS) (0.900 million)

- Continue development of ten-vehicle test systems.
- Conduct test and experiments in user-developed scenarios.
- Collect data for input to Analysis of Alternatives study.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

(U) FY 2002 Plans

JOINT ARCHITECTURE FOR UNMANNED GROUND SYSTEMS (JAUGS) DEVELOPMENT (0.800 million)

- Evolve, refine, and update to achieve greater autonomous capability. Inputs will be received primarily from user appraisals, fielded systems feedback, and industry/Tech Base development efforts.
- Continue configuration management and control.

BASIC UXO GATHERING SYSTEM (BUGS) (0.900 million)

- Complete testing and evaluation of prototype systems.
- Initiate formal Analysis of Alternatives study.

B. Program Change Summary ($ million)

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	12.937	10.294	11.238	Cont
Appropriated Value	17.937	13.974		
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction				
b. Congressionally Directed Undistributed Reduction		(0.096)		
c. OSD Directed Program Reduction/Increase	(0.489)	(0.211)	0.064	
Current Budget Submit/President's Budget	17.448	13.667	11.302	Cont

Change Summary Explanation:

Funding: N/A

Schedule: N/A

Technical: N/A

C. Other Program Funding Summary

D. Acquisition Strategy

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

E. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603709D8Z	PROJECT NAME AND NUMBER Family of Tactical Unmanned Vehicles (FTUV)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
FTUV	1.510	3.167	0.000						CONT	CONT
GLADIATOR	0.000	0.000	1.000						CONT	CONT
MPRS	0.000	0.000	1.402						CONT	CONT
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. FTUV is a joint Army/Marine Corps effort to provide commanders a family of reconnaissance, surveillance and target acquisition UGV's that are properly sized to operate in a variety of tactical situation. There are emerging requirements to provide small, man portable unmanned vehicle systems to support the missions of light military and special operations forces. The program meets mission needs in the areas of reconnaissance for Military Operations in Urban Terrain (MOUT).

The success and lessons learned from FTUV has led to the decision to create two separate program lines. Multiple user tests with prototype systems such as SARGE and URBOT, conducted by soldiers and Marines have defined requirements. The MATILDA, a prototype system, is being procured by Civil Support Detachments as a near term solution. The two new programs being developed are Gladiator and MPRS. Gladiator has evolved from the FTUV program efforts to meet USMC requirements for an unmanned system that can conduct scout and surveillance missions in support of dismounted infantry in a shore to objective maneuver mission. The Man Portable Robotic System (MPRS) will meet the joint requirements for a small man portable robot to conduct sewer and tunnel reconnaissance for US Army engineers and to perform reconnaissance and surveillance for Army and USMC dismounted infantry forces in a MOUT environment.

(U) FY 2000 Accomplishments

- Provided SARGE Vehicles to Marine Corps in support of Limited Objective Experiment (LOE) VI at 29 Palms, California.
- Obtained 4 URBOTS for Joint Combined Forces Advanced Warfighting Experiment (JCF-AWE) Sewer and Tunnel Reconnaissance to be conducted at Ft. Drum, NY and Ft. Polk, LA. Participated in the JCF-AWE at Ft. Drum, NY and Ft. Polk, LA.
- Provided Urban Warrior Mesa Associates' Tactical Integrated Light-Force Deployment Assembly (MATILDA) platforms to the 1st, 4th, 5th, and 7th Civil Support Detachments Weapons of Mass Destruction (CSD-WMD) for evaluation. Provided support to the 5th CSD-WMD Comiskey Park exercise.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2001 Plans

- Conduct Concept Experimentation Program (CEP) at Ft. Leonard Wood, MO, for Military Police (MP) users.
- Obtain additional FTUV robotic platforms for user appraisal and development of Operational Requirements Document for U.S. Army Engineer School and/or U.S. Army Infantry Center.
- Perform analysis of information received from CSD-WMD and FAST for input into ORD requirements for MPRS program.
- Develop Acquisition Documentation for U. S. Marine Corps “Gladiator” program.
- Conduct baseline testing of URBOT robotic platforms.

(U) FY 2002 Plans

- Award CTD/ System design contract for Gladiator.
- Complete AoA for Gladiator.
- Conduct USMC user experimentation for Gladiator.
- Conduct user experimentation with MPRS for the US Army and USMC.
- Initiate MPRS AoA.
- Support CST-WMD prototype fielding of MATILDA for urgent and compelling reasons.
- Develop joint experimentation for marsupial systems with Army and Air Force.
- Anticipate MS B decision for Gladiator in 3QFY03.

B. Other Program Funding Summary

C. Acquisition Strategy

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0603709D8Z		PROJECT NAME AND NUMBER TECHNOLOGY BASE					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
TECHNOLOGY BASE	8.038	0.000	0.000							

A. Mission Description and Budget Item Justification. The Demo III Experimental Unmanned Vehicle (XUV) Program is designed to advance and demonstrate the technology required to develop future unmanned ground combat vehicles through three major thrusts: (1) concerted technology development; (2) modeling, simulation and experimentation; and (3) technology integration and evaluation with users. Demo III focuses on demonstration of technology that will enable the development of small, highly agile, unmanned vehicles capable of off-road, semi-autonomous operation at speeds of up to 32 km/hr during daylight and 16 km/hr at night by 4Q FY 2001. Demo III supports development of two emerging requirements at the U.S. Army Armor School for a robotic scout system and a robotic leader-follower system. Technologies for these systems are applicable to a wide array of Army programs. This program will be transferred to the Army for funding, beginning in FY 2001. A breakout of the three major thrusts follow:

- Concerted Technology Development: The technology development community, drawn primarily from government laboratories such as National Institute for Standards and Technology (NIST), the Jet Propulsion Laboratory (JPL), and the Army Research Lab (ARL), has organized itself into a series of working groups to address six technology areas deemed critical to the success of the program. The primary focus of the effort has centered on the development of perception for autonomous mobility; algorithms for local planning and autonomous behaviors; an intelligent software architecture; and a small, highly capable control interface that can be integrated into standard display units.

- Modeling, Simulation and Experimentation: A modeling, simulation and experimentation effort conducted by the Mounted Battlespace Battle Lab (MBBL), with assistance from ARL, has been running in parallel with the technology development program. The program has the twin goals of utilizing simulations to estimate the operational effectiveness of differing technological solutions and hardware/software configurations, and developing Tactics, Techniques and Procedures required to employ this technology effectively. An important outcome of this effort will be the technical support package (TSP) that will be required to support the second generation Tactical Unmanned Vehicle (TUV) user appraisal currently scheduled for FY 2002.

- Technology Integration and Evaluation with Users: This final component of the program will integrate technology onto a testbed vehicle and demonstrate autonomous mobility required to conduct the

military scout mission under tactical conditions. Unlike the other program elements, this program element was designed to be conducted by an industrial contractor chosen through a competitive procurement process that is being managed by the U.S. Army Tank–automotive/Armament Command's Research, Development, and Engineering Center (TARDEC). In January 1998 TARDEC awarded a contract to a contractor team led by the former Robotic Systems Technology (RST) now General Dynamic Robotic Systems (GDRS), teaming with Science Applications International Corporation (SAIC) Center for Intelligent Systems (CIS) and Sarnoff Corporation.

(U) FY 2000 Accomplishments

- Conducted quarterly In-Progress Reviews with the members of the Integrated Product Teams in December 1999 and April and August 2000.
- Continued development of tactical behavior models in MODSAF.
- Continued development of baseline autonomous tactical behaviors for application to the scout mission.
- Conducted data collection/engineering evaluation activities in preparation for a Battle Lab Warfighting Experiment scheduled for 1st quarter, FY01.
- Developed a high performance Ladar and transferred it to the MDARS-E Program which exceeded all expectations in its capability to detect negative obstacles.
- Developed the technology that was incorporated into two highly mobile robotic platforms which were built for the Unmanned Ground Vehicle/Systems Joint Program Office (UGV/S JPO).
- Developed an Operator Control Unit and transferred this technology to the UGV/S JPO for incorporation on the Panther Program. This technology will serve as the primary soldier-robot interface as this program moves toward more semi-autonomous operations.

(U) FY 2001 Plans:

- US Army will assume funding responsibility in FY 2001

(U) FY 2002 Plans:

- US Army continues funding responsibility in FY 2002

B. Other Program Funding Summary

C. Acquisition Strategy

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603709D8Z	PROJECT NAME AND NUMBER Mobility Enhancements	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Mobility Enhancements	3.000	5.200	3.000						CONT	CONT
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Mobility Enhancements program is a research and development program aimed at improving the mobility of small, man portable unmanned vehicle systems in support of urban warfare, engineering, physical security/force protection missions.

(U) FY 2000 Accomplishments

- Designed an Omni-Directional Inspection System (ODIS) to survey the underside of suspect vehicles.
- Coordinated with the National Institute of Justice to develop small surveillance vehicles for sensor deployment. Systems will be designed to detect weapons of mass destruction—applicable to both the military needs as well as civilian first responders.
- Developed concept for Systems Integration Laboratory (SIL) and Extreme Environments Test Facility (EETF) to evaluate mobility of UGVs.

(U) FY 2001 Plans

- Provide user community with prototype ODIS vehicle.
- Participate in MP demonstration with ODIS to further refine design.
- Design and begin development of SIL.
- Design and begin development of EETF.

(U) FY 2002 Plans

- Participate in Military Police Concept Experimentation Program.
- Conduct baseline testing of ODIS prototype vehicles.
- Complete SIL development.
- Complete EETF development.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

B. Other Program Funding Summary

C. Acquisition Strategy

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4	PROGRAM ELEMENT PE 0603709D8Z	PROJECT NAME AND NUMBER ROBOTICS FOR AGILE COMBAT SUPPORT (RACS)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
RACS	4.000	3.800	4.200						CONT	CONT

A. Mission Description and Budget Item Justification. The Robotics for Agile Combat Support (RACS) currently addresses [1] needs and requirements for remotely detecting, identifying, and safely clearing surface and buried Unexploded Ordnance (UXO) and [2] urgent and compelling requirements from Air Combat Command (ACC) for a remote platform capable of employing a variety of techniques to diagnose and render safe large vehicle bombs (LVBs) and improvised explosive devices (IEDs), and [3] needs outlined in the Air Force Agile Combat Support (ACS) Mission Area Plan (MAP) in support of infrastructure support and force protection. Requirements Documentation is as follows:

- Agile Combat Support (ACS) Mission Area Plan for FY01.
- Mission Need Statement for Active Range Clearance [MNS CAF 306-98]Mission Need Statement for Enhanced Force Protection Capabilities [MNS CAF 314-97].
- Mission Need Statement for Explosive Ordnance Disposal Capabilities [MNS CAF(USN) 001-97].
- Mission Need Statement for Autonomous Firefighting Capabilities [MNS CAF 311-90].
- Operational Requirements Document for All-Purpose Remote Transport System [ORD CAF(USN) 014-93
- I/II-A].

(U) FY 2000 Accomplishments

- Developed and applied Unexploded Ordnance (UXO) disposal technologies in support of Active Range Clearance (ARC) and Wartime Deployment Support.

  - Provided technical support and consulting to AAC/WMO in support of source selection of All-Purpose Remote Transport System (ARTS). Contract for large scale procurement of JRP developed ARTS system completed:
    - o Competitive bidding and economy of scale resulted in a 25% reduction in the procurement cost of the ARTS and associated attachments.
    - o Total of 37 systems purchased (19 currently fielded world-wide, 18 to be fielded over next two years).

  - Completed navigation, communication, and control upgrade (including modification of hardware and software components) of Advanced Automated Ordnance Excavator (AOE).
    - o Conducted series of explosive range tests to validate survivability of robotic platform during

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

"in the bucket" detonations of unexploded ordnance.
  - o Drafted technology transition plan to outline AOE application in range clearance concepts of operation.

- Continued development of a Laser Ordnance Neutralization System (LONS) to utilize a directed energy technology integrated on an unmanned platform to "burn" unexploded ordnance (UXO) and improvised explosive devices (IEDs).
  - o Conducted joint design effort with AFRL/DE (Directed Energy Directorate) at Kirtland AFB to optimize cost, performance, and sustainability laser system
  - o Established joint testing effort with NAVEODTECDIV (Det 63) and Office of Special Technology to validate the performance of laser system against required targets.
  - o Developed preliminary design parameters for the integration of laser system to an unmanned platform.

- Completed the design, development and integration of dual arm, force feedback, multiple degree of freedom, manipulation system (ARMS I) with a unmanned robotic platform (ARTS)
  - o Delivered research and development prototype to 96th CEG/CED (EOD unit) at Eglin AFB for use in the detection, recovery, disassembly, disablement, and disposal of test munitions.
  - o Conducted operational use of ARMS I in six real-world operations at Eglin AFB resulting in significant performance successes (75% cost reduction, reduced recovery time by 50%)
  - o Demonstrated anti-terrorism application of ARMS I in disablement of Improvised Explosive Devices (IEDs).

- Provided Headquarters, Air Education and Training Command (HQ AETC) with several potential technical design solutions (utilizing existing and/or future robotics technology) for unique Luke AFB range residue certification and removal problem.

- Completed modular, snap-on/snap-off integration of Army designed mini-flail onto an Air Force design robotic platform (ARTS).
  - o Demonstrated multi-service application of both the ARTS platform and flail modification
  - o Demonstrated a 75% reduction in research and development costs as a result of using shared, previously proven technologies from multiple services

- Conducted explosive characterization and development of effective anti-terrorism tools and techniques to reduce Weapons of Mass Destruction (WMD) threats.

  - Completed design of initial unmanned deployment system for innovative explosively driven water charge system for anti-terrorism missions.

  - o Demonstrated rapid response prototype system to Technical Support Working Group (TSWG) customers including military and federal agencies.
  - o Initiated follow-on effort with TSWG to characterize and optimize system.

- Completed the design, development, validation, and testing of an advanced robotic anti-terrorism response system.
  - o Leveraged JRP research efforts with federal law enforcement funding to facilitate cost effective design approach.
  - o Delivered prototype system to federal law enforcement for use in real-world force protection missions.

- Developed and applied advanced robotic technologies for integration onto existing and future unmanned systems platforms.

  - Conducted advanced robotics testing and validation on optimized Advanced Mobility Research and Development System (AMRADS).
    - o Designed, developed, and demonstrated advanced platform (AMRADS) utilizing electronic engine control.
    - o Completed integration and demonstration of previous semi-autonomous mobility modules and algorithms from Subsurface Ordnance Clearance System (SOCS).
    - o Developed and demonstrated improved navigation system using academia developed Ground Penetrating Radar (GPR) and inertial navigation unit. Demonstrated preliminary capabilities in AMRADS vehicle control from multiple Operator Control Units (OCUs).

  - Provided extensive support and conducted validation efforts in conjunction with the JRP’s initiative to develop a Joint Architecture for Unmanned Ground Systems (JAUGS).
    - o Demonstrated multiple vehicle control (ARTS, MULE, AMRADS) from a single Operator Control Unit (OCU) using JAUGS compliant commands.
    - o Conducted advanced technology demonstration with industry and academia demonstrating JAUGS application at JAUGS working group.

  - Completed phase one investigation of secondary control source, in response to critical operational needs for alternate robotic control methods.
    - o Cooperated with UGV/S JPO to demonstrate use of Army developed fiber optic as control source for the ARTS saving over $500K

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- Completed phase one investigation of large vehicle, high speed robotics system designed and integrated an advanced robotics package onto a P-19 Fire and Crash Rescue Platform in response to AF needs for unmanned platforms for hazardous fire/crash response and chembio decontamination.
  - o Demonstrated P-19 robotics system operating a high speed (30-40 mph) operated via joystick control.
  - o Developed advanced feedback and software control algorithms to address platform stability (turning speeds, roll-over protection, braking) at high speeds.
  - o Demonstrated use of existing Operator Control Unit (OCU) to operate P-19 robotic system via teleoperation.

(U) FY 2001 Plans

- Research and develop robotics systems to support of Agile Combat Support /Force Protection missions (i.e. UXO Disposal, WMD Threat Reduction, Structural Protection, Physical Security).
  - Advanced Mobility Research and Development System (AMRADS)
  - All-Purpose Remote Transport System (ARTS)
  - Next Generation EOD Robotic System

- Develop and apply advanced robotic technologies for integration onto existing and future unmanned system platforms in support of Agile Combat Support /Force Protection missions (i.e. UXO Disposal, WMD Threat Reduction, Structural Protection, Physical Security, mobility).
  - (**MOBILITY**) Examine existing off-the-shelf units, build custom components for specialized mission requirements, and test these mobility platforms in various mission scenarios.
    - o Assessment of commercial and existing platforms for next generation force protection robotics systems
    - o High speed vehicles
    - o Low cost mobility

  - (**NAVIGATION and SENSOR INTEGRATION**) Investigate acquisition of vehicle system specific parameters for intelligent operations and integrate environmental data acquisition units to detect, classify, and characterize environmental features for mission operations.
    - o Global Positioning System (GPS) / Inertial Navigation
    - o Obstacle Detection and Recognition
    - o Stereo Vision
    - o Forward Looking Infrared (FLIR) and Night Vision for teleportation

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- (**COMMUNICATION**) Determine communications requirements for a network of mobile systems performing a mission.
  - o SMART communication
  - o Non-Line-of-Sight Communication

- (**MAN/MACHINE INTERFACE and CONTROL**) Determine requirements for user interface to mobile systems and mission specific tools. Implement both high and low-end user interfaces for multiple mobile systems.
  - o Robot to robot control (marsupial communication)
  - o Multiple vehicle control
  - o Alternate control input (fiber optics)

- (**INTELLIGENCE**) Determine the requirements for intelligent behaviors and implement an expanding intelligence system in the mobile systems for mission success. This area includes path planning, navigation, and intelligent behavior implementation.
  - o Three-dimensional (3D) path planning.

- (**PAYLOAD DEVELOPMENT and INTEGRATION**) Develop and integrate the tools needed to perform the mission once the mobility platform reaches the destination. Tools range from an articulated robotic manipulator arm to a simple device to gain entry into a building.
  - o Manipulation
  - o Water-Jet Cutter
  - o Explosive Ordnance Disposal tools (Explosively Driven Water Charge)
  - o Laser Ordnance Neutralization System (LONS)

(U) FY 2002 Plans

- Research and develop robotics systems to support Agile Combat Support /Force Protection missions (i.e. UXO Disposal, WMD Threat Reduction, Structural Protection, Physical Security).
  - Advanced Mobility Research and Development System (AMRADS)
  - Next Generation EOD Robotic System
  - Robots Support Environmental Security (ROSES)
  - Next Generation Small Robotics System (Mark IV replacement)

- Develop and apply advanced robotic technologies for integration onto existing and future unmanned system platforms in support of Agile Combat Support /Force Protection missions (i.e. UXO Disposal, WMD Threat Reduction, Structural Protection, Physical Security).

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- **(MOBILITY)** Examine existing off-the-shelf units, build custom components for specialized mission requirements, and test these mobility platforms in various mission scenarios.
  - o Specialized / optimized platforms for next generation force protection robotics systems
  - o High speed vehicles
  - o Low cost mobility

- (**NAVIGATION and SENSOR INTEGRATION**) Investigate acquisition of vehicle system specific parameters for intelligent operations and integrate environmental data acquisition units to detect, classify, and characterize environmental features for mission operations.
  - o Global Positioning System (GPS) / Inertial Navigation
  - o Scene-Based / Visual Navigation
  - o Obstacle Detection and Recognition (ultrasonic sensors, laser line scanner)
  - o Stereo Vision
  - o Forward Looking Infrared (FLIR) and Night Vision for teleoperation
  - o Auto-mapping and database mapping/modeling

- (**COMMUNICATION**) Determine communications requirements for a network of mobile systems performing a mission.
  - o SMART Communication
  - o Non-Line of Sight Communication
  - o Secure Communication Schemes

- (**MAN/MACHINE INTERFACE and CONTROL**) Determine requirements for user interface to mobile systems and mission specific tools. Implement both high- and low-end user interfaces for multiple mobile systems.
  - o Robot to Robot Control (Marsupial Communication)
  - o Multiple vehicle control
  - o Augmented Reality Interfaces

- (**INTELLIGENCE**) Determine the requirements for intelligent behaviors and implement an expanding intelligence system in the mobile systems for mission success. This area includes path planning, navigation, and intelligent behavior implementation.
  - o Three-dimensional (3D) path planning
  - o Robotic Cooperative Behavior

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

- (**PAYLOAD DEVELOPMENT and INTEGRATION**) The tools to perform the mission once the mobility platform reaches the destination. Tools range from an articulated robotic manipulator arm to a simple device to gain entry into a building.
  - o Manipulation
  - o Inspection Sensors
  - o Explosive Ordnance Disposal Tools (Explosively Driven Water Charge)
  - o Laser Ordnance Neutralization System (LONS)
  - o Directed Energy Access System
  - o Projectile Neutralization

B. Other Program Funding Summary

The United States Air Force (USAF), Headquarters Air Combat Command (ACC) has programmed 3600 funding to support Advanced Research and Development (R&D) and Engineering, Manufacturing, and Development (EMD) for advanced force robotic systems designed under the RACS program. In addition, ACC has programmed 3080 funding for the procurement, fielding, and sustainment of advanced force robotic systems/technologies developed under the RACS program.

	FY01	FY02
3600(64617)	0.200	1.700
3080(28028)	3.800	6.200

C. Acquisition Strategy

Technologies developed under the RACS program are transitioned to the Airbase Systems Program Office (AFMC AAC/WMO) for acquisition and procurement. In addition some technologies are transitioned to existing programs both on Air Force Platforms as well as joint service and other DoD platforms. Transfer of dual-use technologies (both military and commercial use) to industry has also been accomplished on several RACS initiatives and continues to be a valid alternative for technology uses.

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY		Program Element PE 0603709D8Z					FTUV					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development				0.598								
Ancilliary Hardware Development				0.150								
Systems Engineering				0.150								
Liscenses												
tooling												
GFE												
Award Fees												
Subtotal Product Development				0.898								
Remarks:												
Development Support				0.300								
Software Development				0.200								
Training Development				0.200								
Integrated Logistics Support				0.050								
Configuration Management				0.050								
Technical Data				0.050								
GFE												
Subtotal Support				0.850								
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE		Program Element					FTUV					
BUDGET ACTIVITY 0		PE 0603709D8Z										
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
DT				0.400								
IOT&E				0.200								
User Appraisal												
Subtotal T&E				0.600								
Remarks:												
Contractor Engineering Support				0.169								
Government Engineering Support				0.100								
Program Management Support				0.050								
Program Management Personnel				0.100								
Travel				0.050								
Labor (Research Personnel)				0.100								
Miscellaneous				0.250								
Subtotal Management				0.819								
Remarks:												
Total Cost				3.167								
Remarks:												

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E,DEFENSE-WIDE/Budget Activity 4	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **ADVANCED SENSOR APPLICATIONS PROGRAM** **PE 0603714D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	26.862	38.010	15.780						Continuing	Continuing
Project Name/No. and Subtotal Cost ASAP/P714	26.862	38.010	15.780						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description of Element: The program focuses on continued development of domestic and assessment of foreign technology that has demonstrated potential for improvements in U.S. capabilities. Unique and innovative approaches are used to expand the performance envelopes of existing systems. This program supports military requirements identified in Joint Vision 2010, the Defense Science and Technology Strategy, Full Spectrum Dominance and the Joint Warfighting Capability Objectives.

Program Accomplishments and Plans:

FY 2000 Accomplishments:

- Mission Support (26.862 million)

FY 2001 Plans:

- Mission Support (38.010 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E,DEFENSE WIDE/BudgetActivity 4	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **PE 0603714D8Z** **ADVANCED SENSOR APPLICATIONS PROGRAM**

FY 2002 Plans:

- Mission Support (15.780 million)

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	26.862	38.066	15.691	Continuing
Appropriated Value				
Adjustments to Appropriated Value				
a. Internal Reprogramming.				
b. Below threshold program adjustments		(.056)		
c. Inflation Adjustment			.089	
President's Budget Submission	26.862	38.010	15.780	Continuing

Change Summary Explanation:
Program adjustment.

C. Other Program Funding Summary: N/A

D. Schedule Profile: N/A

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	**DATE** June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E,DW/BA 4**	**R-1 ITEM NOMENCLATURE/PE NUMBER/PROJECT NO.** **ADVANCED SENSOR APPLICATIONS PROGRAM PE 0603714D8Z/ P714**

A. Project Cost Breakdown ($ in Thousands)

Project Categories	FY 2000	FY 2001	FY 2002
a. Salaries/Benefits	419		
b. Primary Hardware Development			
c. Ancillary Hardware Development			
d. Development Support Equipment Acquisition	60		
e. Research Support Equipment Acquisition	1,949	9,575	882
f. Software Development	1,346	1,500	1,350
g. Licenses	346	238	223
h. Systems Engineering	1,829	1,170	820
i. Training Development	110	600	
j. Integrated Logistics Support	303	420	274
k. Quality Assurance	260	260	260
l. Reliability, Maintainability & Availability	520	544	544
m. Configuration Management	755	752	770
n. Technical Data	8,517	7,423	5,168
o. Development Test & Evaluation	4,719	7,385	2,295
p. Operational Test & Evaluation	750	300	
q. Contractor Engineering Support	1,020	841	212
r. Government Engineering Support	301	2,082	
s. Program Management Support	1,050	786	292
u. Travel	150	120	350
v. Research Personnel	1,603	4,000	1,575
w. Miscellaneous (less than 15%)	855	25	765
Total	**26,862**	**38,021**	**15,780**

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E/BA 4**	**R-1 ITEM NOMENCLATURE/PE NUMBER/PROJECT NO.** **ADVANCED SENSOR APPLICATIONS PROGRAM** **PE 0603714D8Z/P714**

C. Funding Profile Fiscal Year actual and planned obligations and expenditures

Funds Profile	PY Obs	CY Obs	BY1 Obs	PY Exp	CY Exp	BY1 Exp
PYQ1	2,794			414		
PYQ2	12,630			358		
PYQ3	4,928			2,049		
PYQ4	6,510			5,229		
PYTot	**26,862**			**8,050**		
CYQ1		10,838		3,244	3,214	
CYQ2		21,796		4,338	5,634	
CYQ3		5,387		5,861	6,809	
CYQ4				5,369	8,243	
CYTot		**38,021**		**18,812**	**23,900**	
BY1Q1			10,750		6,514	3,150
BY1Q2			4,691		4,635	2,657
BY1Q3			250		2,010	1,172
BY1Q4			89		951	2,948
BY1Tot			**15,780**		**14,121**	**9,927**
BY2Q1						3,067
BY2Q2						1,868
BY2Q3						829
BY2Q4						89
BY2Tot						**5,583**
Total of fiscal year	**26,862**	**38,021**	**15,780**	**26,862**	**38,010**	**15,780**

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE, BUDGET ACTIVITY 4					R-1 ITEM NOMENCLATURE CALS, The Strategy, PE 0603736D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	5.383	8.522	1.614						Continuing	Continuing
Program Specifics										

A. Mission Description and Budget Item Justification

(U) (U) BRIEF DESCRIPTION OF ELEMENT: CALS is an international core strategy to share integrated digital product data through a set of standards to achieve efficiencies in business and operational mission areas. DoD's overarching goal in CALS is to develop a seamless defense enterprise in which the knowledge products of the acquisition process are immediately and rapidly accessible to all authorized users while maintaining near immediate currency and quality of information. This desired state is referred to as the "Integrated Data Environment (IDE)". The IDE (immediate access to quality information) drives many defense-wide and functional-specific reforms and business process improvements. The rapid sharing of information is an implied requisite of Integrated Product and Process Teams, a fundamental process for implementing concurrent engineering and streamlining project management. Digitized information frees logistics support and operator personnel from the burden of cumbersome document or file formats for information processing or presentation – enabling new methods for the performance of maintenance and training tasks based on interactive electronic technologies. This program element is to (1) assess and transition evolving automation technologies into the CALS strategy; (2) develop, maintain and apply to weapon system program office operations an executable business model for the application of CALS and related technologies; (3) integrate technical and functional requirements into a Shared Information Framework of the standards, protocols, procedures, and network management conventions required to achieve compatible implementation of the IDE throughout the international defense enterprise.

(U) FY 2000 Accomplishments

- Continue to reengineer logistics processes based on CALS technologies ($1.005 Million)
- Employ CALS in developing architectures to govern the modernization of integrated supply chain information systems ($.800 Million)
- Reengineering logistics processes based on CALS technologies and integrate maintenance prognostics and IETM architecture ($3.278 Million)
- Integrating CALS technologies with dynamic product models ($.300 Million)

Exhibit R-2, RDT&E Budget Item Justification | Date: June 2001

(U) FY 2001 Program

- Continue to reengineer logistics processes based on CALS technologies ($.500 Million)
- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems ($.384 Million)
- Reengineering logistics processes based on CALS technologies and integrate maintenance prognostics and IETM architecture ($7.000 Million)
- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems ($.278 Million)
- Integrating CALS technologies with dynamic product models ($.260 Million)
- Reengineer logistics processes based on CALS modernization technologies ($.100 Million)

(U) FY 2002 Plans

- Continue to reengineer logistics processes based on CALS technologies ($.910 Million)
- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems ($.704 Million)

B. Program Change Summary ($ millions)

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget	1.652	8.585	1.614	Continuing
Appropriated Value	5.652			
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction				
b. Congressionally Directed Undistributed Reduction				
c. OSD Directed Undistributed Reduction	(.269)	(.063)		
Current Budget Submit/President's Budget	5.383	8.522	1.614	Continuing

Change Summary Explanation: Adjustment reflects inflation saving and the Government-wide rescission.

Funding: N/A

Schedule: N/A

Technical: N/A

C. Other Program Funding Summary: N/A

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

D. Acquisition Strategy: N/A

E. Schedule Profile: N/A

Fiscal Year actual and planned events:

	FY2001	FY2002

Acquisition Milestones: N/A

Engineering Milestones: N/A

T&E Milestones: N/A

Contract Milestones: N/A

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

Exhibit R-2a, RDT&E Project Justification								Date: June 2001		
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0603736D8Z		PROJECT NAME AND NUMBER CALS, The Strategy					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
CALS IETM Architecture	3.278	8.522	1.614	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification The Joint Logistics Commanders documented an interoperability requirement for the development and deployment of Interactive Electronic Technical Manuals in a memorandum for the DUSD (Logistics) from Joint Logistics Commanders, 10 June 1997, and assigned responsibility to the Tri-Service Interactive Electronic Technical Working Group. This initiative provides technical support to the working group to accomplish several tasks in support of their mission. Total asset identification and application is not possible electronically without automation of the DoD Type Designation System and development of a link between Weapon Systems and the Federal Logistics Information System. CALS IETM researches into the application of Electronic Commerce and Electronic Data Interchange (EC/EDI) standards for business process application.

(U) FY 2000 Accomplishments

- Reengineering logistics processes based on CALS technologies and integrate maintenance prognostics and IETM architecture
- Integrating CALS technologies with dynamic product models

(U) FY 2001 Program

- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems
- Continue to integrate CALS technologies with dynamic product models
- Reengineer logistics processes based on CALS modernization technologies
- Employ CALS in developing architectures to govern the modernization of integrated supply chain information systems

(U) FY 2002 Plans

- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems
- Continue to reengineer logistics processes based on CALS technologies

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

B. Other Program Funding Summary

C. Acquisition Strategy
Congress added $4.0M of FY00 and $7.0M of FY01 RDT&E funds for the Integrated Data Environment (IDE) /Computer Aided logistics (CALS) program. The IDE project develops research information management techniques to support The "Policy for the Transition to a Digital Environment for Acquisition Programs," DUSD(Logistics), July 2, 1997; and the "Life Cycle Information Integration Directive," USD(A&T), July 17, 1998.

D. Schedule Profile

Fiscal Year actual and planned events: FY2001 & FY2002

Acquisition Milestones: N/A

Engineering Milestones: N/A

T&E Milestones: N/A

Contract Milestones: N/A

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

Date: (MONTH/YEAR)
June 2001

APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE
RDT&E, Defense-wide/ Budget Activity 4	Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

Cost *(In Millions)*	FY 2000	FY 2001	FY2002						Cost to Complete	Total Cost
Total PE 0603851D Cost	22.806	28.987	25.314						Continuing	Continuing
ESTCP/P514 Cost	22.806	28.987	25.314						Continuing	Continuing

A. Mission Description and Budget Item Justification

This program demonstrates and validates the most promising innovative environmental technologies that target DoD's most urgent environmental needs and are projected to pay back the investment within five years through cost savings and improved efficiencies. It responds to: (1) congressional concern over the slow pace of remediation of environmentally polluted sites on military installations, (2) congressional direction to conduct demonstrations specifically focused on emerging new technologies, (3) Executive Order 13148 which requires Federal agencies to place a high priority on obtaining funding and resources needed for the development of innovative pollution prevention programs and technologies for installations and in acquisitions, and (4) the need to improve defense readiness by reducing the drain on the Department's operation and maintenance dollars caused by real world commitments such as environmental restoration and waste management. Preference for demonstrations are given to technologies that respond to Environmental Security objectives, have successfully completed all necessary research and development objectives, and address the highest priority DoD environmental requirements. Project funding supports the following categories for each year.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/ Budget Activity 4	R-1 ITEM NOMENCLATURE Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

FY 2000 Accomplishments:

- Reviewed and selected 35 technologies for demonstration.
  - Reviewed and selected sites for demonstration of technologies.
  - Prepared site-specific implementation plans.
  - Prepared sites and secure regulatory permitting.
- Continued to demonstrate and evaluate 22 selected technologies.
- Completed evaluation of 15 technologies.

By Pillar:

- Remediation: Successfully demonstrated and validated technologies in multiple high priority areas related to the Cleanup of contaminated DoD sites. For example, ESTCP Researchers have developed a standardized protocol that describes a simple and cost effective treatability test to determine the potential for employing reductive anaerobic biological in-situ treatment technologies to remediate chloroethenes. Successfully developed and demonstrated an enhanced treatment system that uses surface active agents (surfactants) to remediate Dense Non-Aqueous Phase Liquid (DNAPL) contamination in soil. To improve risk management decisions at contaminated sediment sites based on direct quantification of contaminant mobility, researchers have designed, developed, demonstrated, and certified a Benthic Flux Sampling Device (BFSD) technology to establish the capability for direct measurement of metals and organic contaminant remobilization in sediments. ($7.337 Million)
- Unexploded Ordnance (UXO): ESTCP validated UXO technologies are having a significant impact on the DoD UXO remediation efforts. To address the challenge associated with locating UXO buried in highly vegetative and variable terrain, researchers have developed a portable detection system that will allow the collection and analysis of high-quality data at all DoD ranges regardless of terrain or tree cover equivalent to the most advanced vehicular systems. To reduce false-positive rates for UXO detection methods, ESTCP researchers have demonstrated advanced algorithms using data from both Magnetometer and EMI sensors to improve ordnance characterization and the rejection of false targets. ($4.252 Million)
- Pollution Prevention: ESTCP continues to validate and transition environmentally clean technologies which directly support the military mission. Examples include, an enhanced, "drop-in", fully environmentally-compliant, Low VOC Chemical Agent Resistant Coating was successfully demonstrated at Marines Barstow Logistics Facility, CA, under production conditions. Successful demonstration of a high velocity oxygen-fuel thermal spray technology as an environmentally friendly alternative for hard chrome plating for main landing gear components was flight tested. A zero Volatile Organic Compound (VOC) polyurethane topcoat technology was successfully demonstrated on multiple aircraft. Shock-absorbing concrete (SACON) was demonstrated to be an effective means of capturing and containing lead on small-arms ranges, while inhibiting the leaching of lead corrosion products. ($6.598 Million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/ Budget Activity 4	R-1 ITEM NOMENCLATURE Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

- Compliance: Significant progress has been made in the development of waste treatment and environmental monitoring technologies required by DoD. These include: successful testing of a catalyzed, self-regenerating ceramic filter for engines to reduce fine particulate matter; optimization of operational parameters for technology to remove, separate and recover heavy metals from industrial wastestreams at DoD facilities; demonstration of a real-time monitoring, airborne lead analyzer at indoor firing ranges; and successful validation of the Low Range Differential Pressure (LRDP) leak detection system for underground bulk fuel tanks. ($4.412 Million)

FY 2001 Plans:

The FY2001 funds are invested in projects that address priority DoD environmental requirements.

- Review and award 25 technologies for demonstration.
- Continue and complete 57 technology demonstrations.
    - Review and select sites for demonstration of technologies.
    - Prepare site-specific implementation plans.
    - Prepare sites and secure regulatory permitting.

By Pillar:

- Remediation: Demonstrate and validate innovative technologies to restore DoD facilities contaminated with toxic or hazardous waste. ($8.900 Million)
- Unexploded Ordnance: Demonstrate and validate innovative technologies to detect UXO and remediate land contaminated with UXO. ($8.110 Million)
- Pollution Prevention : Demonstrate validate innovative technologies to reduce the use of hazardous materials, and curb emissions of pollutants in military operations as well as weapons systems manufacturing, operations, and maintenance. ($8.032 Million)
- Compliance: Demonstrate and validate innovative technologies to ensure DoD complies with our federal, state, and local environmental laws. ($3.945 Million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/ Budget Activity 4	R-1 ITEM NOMENCLATURE Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

FY 2002 Plans:

- Review and select technologies for demonstration.
  - Review and select sites for demonstration of technologies.
  - Prepare site-specific implementation plans
  - Prepare sites and secure regulatory permitting
- Award demonstration testing and evaluation for selected technologies.

By Pillar:

- Remediation: ($7.904 Million)
- UXO: ($ 4.970Million)
- Pollution Prevention: ($8.300 Million)
- Compliance: ($ 4.140Million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/ Budget Activity 4	R-1 ITEM NOMENCLATURE Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

Justification for Budget Activity Assignment: To conform to the defined DoD acquisition milestones sequence, this program element is categorized under Budget Activity 4, Demonstration and Validation (Dem/Val).

Acquisition Strategy: When demonstration and validation of a particular technology is completed, and if the technology is found to be effective and affordable by users, regulators and other stakeholders, a user data package will be developed and distributed, e.g., specification, procurement package, etc., providing details to users on the technologies validated cost and performance and on how to acquire and implement the technology. When this step is completed, the demonstration will be considered successful.

B. Program Change Summary ($ in millions)

	FY 2000	FY2001	FY2002	Total Cost
Previous President's Budget	23.260	24.906	25.314	Continuing
Appropriated Value	23.260	29.256		
Adjustments to Appropriated Value				
a. Undistributed reduction	(.372)	-0.269		
b. SBIR	(.082)			
Current President's Budget	22.806	28.987	25.314	Continuing

Change Summary Explanation: FY 2000 changes are due to undistributed reductions. FY2001 changes reflect Congressional actions.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/ Budget Activity 4	R-1 ITEM NOMENCLATURE Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

C. Other Program Funding Summary Not applicable.

D. Acquisition Strategy ESTCP projects are individually managed by the designated Service leads. Contracting is performed by the Service organization with responsibility for leading the validation effort for the technology being demonstrated.

E. Schedule Profile (Fiscal Year actual and planned events by quarter)

	FY 2000				FY 2001				FY 2002			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones												
- Select technology				X								
- Select site					X							
Engineering Milestones												
- Complete site prep and regulatory permitting							X					
T&E Milestones												
- Complete T&E											X	
Contract Milestones												
Other Program Events												
- Obtain user, regulator and other stakeholder approvals												
- Develop and distribute user data packages												

The above milestones reflect the average life cycle of a typical, successful remediation demonstration utilizing FY 2001 funding. A similar pattern is expected for FY 2002.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE : (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/Budget Activity 4	R-1 ITEM NOMENCLATURE PE NUMBER/PROJECT NUMBER Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

Project Cost Categories	FY 2000	FY 2001	FY 2002	
Cost Categories:				
a. Demonstration & Validation	21.499	27.701	24.064	
b. Program Management Support	1.307	1.286	1.250	
TOTAL	22.806	28.987	25.314	25.908

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE : (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-wide/Budget Activity 4	R-1 ITEM NOMENCLATURE PE NUMBER/PROJECT NUMBER Environmental Security Technology Certification Program (ESTCP) PE 0603851D8Z

B. Budget Acquisition History and Planning Information

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 2000	Budget FY 2000	Budget FY 2001	Budget FY 2002	Budget to Complete	Total Program
DoD	C	-	-	-	120.340	22.806	28.987	25.314	Continuing	Continuing

Actual or Budget Value ($ in millions)

Government Furnished Property

Item Description	Contract Method/Type or Funding Vehicle	Award or obligation Date	Delivery Date	Total Prior to FY2000	Budget 2000	Budget 2001	Budget 2002	Budget to Complete	Total Program

Product Development Property (list each item separately) N/A
Support and Management Property (list each item separately) N/A
Test and Evaluation Property (list each item separately) N/A
Subtotal Product and Development
Subtotal Support and Management
Subtotal Test and Evaluation

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-4	R-1 ITEM NOMENCLATURE Tactical Anti-Satellite Program Development 0603892D8Z

COST *(In Thousand)*	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total Cost
Total Program Element (PE) Cost	7,100	0	0	0	0	0	0	0	Cont.
Kinetic Energy anti-satellite Cost	7,100	0	0	0	0	0	0	0	Cont.

A. Mission Description and Budget Item Justification: The U.S. military has become dependent on satellites as a primary source of information in virtually all of its operations and then looking at the world-wide proliferation of technology which is making this type capability readily available to virtually any country. Today, national defense planners and strategists have to operate with the knowledge that future adversaries will have access to satellite derived intelligence, warning, communications, navigation, weather and other information that can significantly enhance their war-fighting capability and increase the risk to U.S. and allied forces. The execution of the FY 2000 funding is contingent upon the results of the on-going congressional and department review.

(U) In 1989 the Department of Defense initiated a program to develop a ground-launched, kinetic energy (i.e., hit-to-kill) anti-satellite (KE ASAT) weapon system which would leverage off technologies developed by the U.S. Army Space and Strategic Defense Command in support of the (then) Strategic Defense Initiative Organization. Following a Milestone I Defense Acquisition Board Review in December of 1989, the Army was given responsibility for development of the weapon elements of the system (booster, kill vehicle, launch and ground support systems, and the mission and battery control centers.) The Air Force was given responsibility for development of the command and control elements that would have allowed the Commander-in-Chief, U.S. Space Command (USCINCSPACE) to plan and control ASAT engagements.

(U) With the end of the cold war the perceived need for this capability, as well as support for continued funding diminished steadily and the program was restructured several times. The National Defense Authorization Act for fiscal year 1994 (FY 1994) directed that the program be converted to a Tactical ASAT Technology Program as opposed to an acquisition program with a low funding level. Under this current program, the KE ASAT was test fired in September 1994, successfully meeting all requirements. This 94-pound kill vehicle is the critical component of a KE ASAT.

FY 2000 Program Accomplishments:

- Provided funds for KE-ASAT Integrated Command and Control System
- Kill Vehicle Hardware Overrun Coverage
- KE-ASAT/Navigation Operational Requirements Document (ORD) Review
- ORD Critical Performance Parameter Analysis of Alternatives

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-4	R-1 ITEM NOMENCLATURE Tactical Anti-Satellite Program Development 0603892D8Z

- Kill Vehicle Lethality/Susceptibility Analysis
- Debris Analysis
- Kill Device Alternatives and Investigations

B. Program Change Summary:

	FY2000	FY 2001	FY 2002
Previous President's Budget Submit	0	0	0
Adjustments to Appropriated Value Congressional Add	7.500	0	0
Program Adjustments	(.400)	0	0
Current President's Budget	7.100	0	0

Change Summary Explanation

This program was a congressional add in FY 2000. No out year funding has been programmed.

C. Other Program Funding Summary

Not Applicable

D. Schedule Profile

Not Applicable

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 4							R-1 ITEM NOMENCLATURE Humanitarian Demining **PE 0603920D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	18.200	12.611	13.512						Continuing	Continuing
Humanitarian Demining/P920t	18.200	12.611	13.512						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) This Humanitarian Demining R&D program element focuses on the testing, demonstration and validation of equipment suitable for immediate use in various international humanitarian demining missions and environments. The goal is to provide equipment to the international demining community so that they may assess the equipment's capabilities in actual demining conditions. This program focuses on R&D technology development that reduces the time and cost associated with demining while improving the overall safety of the operator. This is accomplished through the adaptation of commercial-off-the-shelf equipment, the integration of mature technologies, and the leveraging from past and current R&D project activity in the tactical countermine and unexploded ordnance clearance mission areas. The primary objectives this program aims to achieve in technological development are to improve existing mine/minefield detection; improve current wide area survey equipment; clear large areas faster and more efficiently with improved mechanical mine/vegetation clearance equipment; provide improved protection for deminers; detect explosives in buried mines (biosensors); confirm the presence of mines (verification); mark and map mines/minefields; improve post clearance quality assurance (QA) equipment; train deminers in mine awareness, and improve deminer hand tools. These areas of emphasis have been adopted as a direct result of an annual Humanitarian Demining Workshop, the most recent of which took place in July 2000.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 4	**R-1 ITEM NOMENCLATURE** Humanitarian Demining **PE 0603920D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	18.200	12.611	13.512						Continuing	Continuing
Humanitarian Demining/P920t	18.200	12.611	13.512						Continuing	Continuing

(U) Project Number and Title: P920t Humanitarian Demining

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) Completed development and demonstrations on the improvements of existing mine detection technologies to include detection to a depth of 27cm. Evaluated existing commercial-off-the-shelf handheld metal detectors suitable for detecting mines; identified those best suited for specific environments; and prepared a "consumer report" that documents the data analysis and assessment of this International Pilot Project for Technology Cooperation. Completed development and demonstration of vegetation clearing devices and improved in-situ neutralization devices. Continued to develop and demonstrate improved protective equipment for deminer protection and comfort. Continued to leverage existing technology from the tactical countermine area to develop and demonstrate detection technologies used for discrimination and verification. Continued to develop mechanical clearance equipment suitable for large area reduction and QA operations. Deployed many prototype equipment items to mine infested regions of the world (Jordan, Egypt, Cambodia, Croatia, Kosovo, Namibia) supporting country requests for operational field evaluations. Continued to develop mine/minefield marking and mapping systems and large area survey equipment. Continued to develop information and instructional materials to support equipment field guides, mine awareness and training. ($ 18.200 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 4	**R-1 ITEM NOMENCLATURE** Humanitarian Demining **PE 0603920D8Z**

(U) FY 2001 Plans:

(U) Continue to develop and demonstrate detection technologies for discrimination and confirmation to include leveraging existing technology from the tactical countermine area. Complete International Pilot Project Technology Cooperation Project documentation. Initiate/complete operational field evaluations of mine/vegetation clearance systems in mine infested regions of the world to include Angola, Namibia, Cambodia, Thailand, and Mozambique. Complete and distribute the 2000-2001 Humanitarian Demining R&D Program Developmental Technologies catalog that reports on progress in developing equipment to assist with the global demining effort. Continue to develop and demonstrate individual deminer protective equipment. Continue development of equipment suitable for area reduction and quality assurance operations. Continue to develop information and instructional aids that improve mine awareness and the quality of deminer training. Initiate a wide area detection cooperative endeavor with international partners. ($ 12.611 million)

(U) FY 2002 Plans:

(U) Continue to develop and demonstrate detection technologies for discrimination and confirmation to include leveraging existing technology from the tactical countermine area. Continue operational field evaluations of mine/vegetation clearance systems in mine infested regions of the world. Continue to develop and demonstrate individual deminer protective equipment. Continue development of equipment suitable for area reduction and quality assurance operations. Continue to develop information and instructional aids that improve mine awareness and the quality of deminer training. Continue wide area detection cooperative endeavor with international partners.($ 13.512 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 4	**R-1 ITEM NOMENCLATURE** Humanitarian Demining **PE 0603920D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	18.618	12.728	13.733	Continuing
Appropriated Value	0.000	12.728	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.089	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.418	-0.117	0.000	
c. Other	0.000	0.000	-0.297	
Current President's Budget	18.200	12.611	13.512	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding was reflected on the FY 2000 Omnibus reprogramming. FY 2001 reductions reflect Section 8086 adjustments.

(U) Schedule: N/A

(U) Technical: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 4	**R-1 ITEM NOMENCLATURE** Humanitarian Demining **PE 0603920D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide/ Budget Activity 4**	R-1 ITEM NOMENCLATURE **Coalition Warfare 0603923D8Z**

Cost *(In Millions)*	FY 2000	FY 2001	FY 2002	FY2003	FY2004	FY2005	FY2006	FY 2007	Cost to Complete	Total Cost
Total 0603923D Cost	0	5.945	12.943						Continuing	Continuing

A. Mission Description and Budget Item Justification

This program provides resources for the U.S. portion of bi-lateral and multi-lateral development projects, aimed at improving interoperability with allies and other likely coalition partners. Recent coalition operations, exercises and experiments have revealed the increasing complexity and difficulty of prosecuting multi-national air, land, and sea campaigns. Interoperability gaps between partners have retarded mission efficiency and jeopardized force protection. The complexity of the coalition battlefield makes it necessary to work cooperatively with our likely coalition partners to solve interoperability gaps in C3I, logistics and weapon systems as well as to improve coalition training capabilities.

Coalitions are the preferred means by which the U.S. and our partners address international crises. Coalitions lend political legitimacy and provide resources that mitigate the U.S. financial, materiel and personnel burden (OPTEMPO). Further, this PE directly supports the goals of the 1999 NATO Summit's Defense Capabilities Initiative.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide/ Budget Activity 4**	R-1 ITEM NOMENCLATURE **Coalition Warfare 0603923D8Z**

This program leverages foreign and other U.S. investment in ongoing projects so as to add a coalition capability that otherwise would not have existed. Both U.S. and foreign-unique technologies and research may be applied to improve the end product.

Projects utilizing this funding are in one of two categories. First, Coalition Warfare funds (no more than 50% of total project cost) and foreign contributions (50% or more) would be added to planned or existing U.S.-only projects so as to add a coalition capability that would not have otherwise existed. Second, Coalition Warfare funds may be spent on U.S.-only fixes to existing systems or capabilities that will yield direct coalition capability enhancements.

Candidate projects are nominated by the CINCs (through their CINC Interoperability Program Offices), Services, OSD, and potentially, foreign governmental sources. OSD performs a down-select of projects based on programmatic executability, the scope of the coalition problem being approached, the potential to spread the benefits to multiple theaters, among other factors.

FY 2001 Accomplishments:

- Selected and provided funding to four projects: the Coalition Demonstration for the multi-national Coalition Aerial Surveillance and Reconnaissance program, the US-UK Asset Tracking/Logistics Interoperability project, the CENTAF-Royal Saudi Air Force Common Air Operating Picture program, and the Coalition Readiness Integrated Management System program with Australia, the UK and the Netherlands.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide/ Budget Activity 4**	R-1 ITEM NOMENCLATURE **Coalition Warfare 0603923D8Z**

FY 2001 Accomplishments: (cont'd)

- Supported the project proponents in negotiating necessary international agreements.

FY 2001 Plans:

- Review FY02-start candidate projects.
- Select projects for FY02 starts and begin preparing for execution.
- Assist in the negotiation and conclusion of any necessary international agreements.
- Continue outreach to the field for high-quality candidate projects.

FY 2002 Plans:

- Assist in the negotiation and conclusion of any necessary international agreements.
- Perform call for programs for future years and down-select candidates for execution.

B. Program Change Summary **($ in thousands)**

	FY 2000	FY 2001	FY2002	Total Cost
Previous President's Budget	0	$11.830	$12.943	Continuing
Appropriated Value		$6.00		
Adjustments to Appropriated Value		-$5.830		
a. Undistributed reduction		-$.055		
b. SBIR				
Current Budget Submit/ President's Budget		$5.945	$12.943	Continuing

Change Summary Explanation: N/A This program is a new start for FY 2001. Changes are the result of Section 8086 reductions.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date: (MONTH/YEAR) June 2001
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide/ Budget Activity 4**	R-1 ITEM NOMENCLATURE **Coalition Warfare 0603923D8Z**

C. Other Program Funding Summary: Not applicable.

D. Acquisition Strategy: This program element funds research, development, test, evaluation and management of U.S. efforts to achieve interoperability with allies and other friendly foreign countries across the full range of likely coalition operations.

E. Schedule Profile (Fiscal Year actual and planned events by quarter)

	FY 2000				FY 2001				FY 2002				FY 2003			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Coalition Warfare candidate projects decided				X		X				X						
Initiate Cooperative project negotiations				X		X	X			X	X	X				
Begin executing funds under projects						X	X			X	X					
Perform outreach to field for candidate projects					X	X	X	X	X	X	X	X				

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6					R-1 ITEM NOMENCLATURE Joint Systems Education & Training – PE: 0604722D					
COST *($ In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	3.357	2.973	0	0	0	0	0	0	6.330	6.330

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(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT: The program element supports the development of training and education prototypes for advanced distributed learning for all of the Services. Its broad, interservice use will establish a foundation for collaborative initiatives to jointly develop content and the learning environment for Advanced Distributed Learning (ADL). These prototypes will leverage successful research and development in training and education. Policy oversight of this program will be managed by ODUSD-R/R&T and the program will be executed by the Naval Air Warfare Center Training Systems Division through the Joint Orlando Interservice/Interagency Advanced Distributed Learning Co-laboratory to support the development of ADL prototypes .

PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2000 Accomplishments:

- Developed sixteen ADL prototypes using the ADL shareable courseware reference model.
- Initiated the compilation of guidelines for web-based instruction.

(U) FY 2001 Accomplishments:

- Developed ten additional prototypes in the areas of medical, performance support, and use of entertainment and gaming technology for advanced distributed learning which are being applied to military training requirements.
- Issued and enhanced guidelines for designing web-based instruction.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLATURE Joint Systems Education & Training – PE: 0604722D

(U) B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	0	0	0	0
Appropriated Value				
Congressional Directed Transfer	3.500			3.500
Adjustments to Appropriated Value/Transferred Amount				
a. Congressional realignment to PE0604722D	3.500	3.000		6.500
b. Congressionally Directed Undistributed Reductions	-.143	-.027		-.170
c. Other (DOD Program Changes)				
Current Budget Submit/President's Budget	3.357	2.973	0	6.330

(U) Funding: The change in FY-2000 is the result of congressional realignments or adjustments

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLATURE Joint Systems Education & Training – PE: 0604722D

(U) C. Other Program Funding Summary: Not Applicable

(U) D. Acquisition Strategy: Not Applicable

(U) E. Schedule Profile: Not Applicable

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RESEARCH, DEVELOPMENT, TEST & EVALUATION, DEFENSE-WIDE, BUDGET ACTIVITY 5					R-1 ITEM NOMENCLATURE JOINT ROBOTICS PROGRAM PE 0604709D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total PE Cost	14.545	14.915	13.197						N/A	CONTINUING
SRS	9.545	4.000	3.000						N/A	CONTINUING
RCSS	3.000	6.915	4.197						N/A	CONTINUING
MDARS-I	2.000	4.000	3.000						N/A	CONTINUING
MDARS-E	0.000	0.000	3.000						N/A	CONTINUING

A. Mission Description and Budget Item Justification. This program is a budget activity level 5 based on the successful transition of robotic technologies from Program Definition and Risk Reduction (PDRR) activities to Engineering, Manufacturing and Development (EMD). This PE was established in response to Office of the Secretary of Defense (OSD) and Service agreement at the April 1997 Joint Robotics Program General Officer Steering Committee (GOSC). The agreement was to have OSD retain oversight of DoD robotics programs through EMD. Individual Services are responsible for requirements generation and procurement funding. Within the JRP, emphasis is on the development of robotic technologies that: are usable in multi-service missions; provide capability in hazardous environments; provide improved battlefield efficiency using supervised autonomous operational capability; reduce or enhance force manpower and sustainability; and are affordable. Success has been achieved in four programs to justify EMD at this time. This PE establishes the consolidated DoD robotics program for Unmanned Ground Vehicles (UGV) and advances UGV concepts into EMD for (1) the Standardized Robotic System (SRS) - a generic, modular set of kits that can be used to retrofit several different types of currently fielded vehicles to allow remote obstacle breaching operations (minefields, earthworks, bunkers, etc.), and have supported operations in Bosnia and Kosovo; (2) the Robotic Combat Support System (RCSS) – a mine neutralizing capability/wire breaching and smoke obscurant system with P3I upgrades such as manipulator arm, semi-autonomous/autonomous control; (3) the Mobile Detection Assessment Response System, Interior (MDARS-I) - which will provide physical security inside warehouses of fixed installations and large storage facilities, protection of critical inventory items and track movement of items in warehouses and ammunition storage facilities; and (4) the Mobile Detection Assessment Response System, Exterior (MDARS-E)– which is intended to provide unmanned roving security patrols among buildings and around perimeters of large fixed installations.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

B. Program Change Summary ($ million)

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	12.004	11.553	13.123	Cont
Appropriated Value	15.004	15.053		
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction				
b. Congressionally Directed Undistributed Reduction		(0.105)		
c. Program Reduction/Increase	(0.459)	(0.033)	0.074	
Current Budget Submit/President's Budget	14.545	14.915	13.197	Cont

Change Summary Explanation:
Funding: FY 2000-2001 inflationary savings; FY 2000 government-wide rescission
Schedule: N/A
Technical: N/A

C. Other Program Funding Summary

D. Acquisition Strategy

E. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
MDARS-I			S-IPR
RCSS		MS A	MS B
MDARS-E			SDD
Engineering Milestones			

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

	FY2000	FY2001	FY2002
T&E Milestones			
MDARS-I		LUT	
MDARS-E			DT
RCSS			IVT
SRS			DT/OT
Contract Milestones			
MDARS-I			LRIP
RCSS		PDRR	

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

Exhibit R-2a, RDT&E Project Justification			Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 5	PROGRAM ELEMENT PE 0604709D8Z	PROJECT NAME AND NUMBER Standard Robotics System (SRS)	

Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
SRS	9.545	4.000	3.000						N/A	CONT
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification The Standardized Robotic System (SRS) program is a generic and modular robotic system that can be retrofitted to many different military applications and vehicles. Currently, the MK IV SRS is being built for three different engineer dozers (D7G, T3 and DEUCE) to allow remote obstacle breeching operations (minefields, earthworks, bunkers and obstacles such as clearing of rubble in a MOUT environment or a man made obstacle covered by enemy fire). The Joint Project Office continues to support six prototype systems in Bosnia and Kosovo that have cleared over 500 mines and sub munitions. The US Army approved the Operational Requirements Document (ORD) in September 1997.

(U) FY 2000 Accomplishments

- Executed SRS EMD contract effort for the design, manufacture and delivery of engineering prototype kits (D7G, T3 Dozer, DEUCE) for Developmental Testing (DT) and Operational Testing (OT).
- Conducted engineering and program management support for the SRS kit development.
- Built and started integration of the engineering prototype on the D7G dozer.
- Built and integrated a SRS kit on the M1A1 chassis, which will replace the M60 Panther systems in the Balkans.
- Integrated the SRS onto the T3 dozer, which participated in the Joint Contingency Force Army. Warfighting Experiment at Ft. Polk, LA, conducting an obstacle reduction mission in a MOUT environment.
- Developed an SRS kit for the Interim Vehicle Mounted Mine Detector (IVMMD) program and completed user testing at Aberdeen Proving Ground, MD.

(U) FY 2001 Plans

- Continue SRS EMD effort for the design, manufacture and delivery of engineering prototypes.
- Engineering and program management support for the SRS kit development.
- Complete testing and field the Abrams Panther prototype system (M1A1 chassis) in the Balkans to replace the M60 Panther.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2002 Plans

- Procure two kits to support DEUCE Concept Exploration Program (CEP).
- Procure kits for fielding to the Army Interim Brigade Concept Teams (IBCT). [OPA]
- Continue the design, manufacture, and delivery of test assets for the SRS program.
- Initiate DT and OT for the SRS kit on DEUCE.
- Complete design and performance specification for the T3 and DEUCE SRS kit application.
- Engineering and program management support for SRS kit development.

B. Other Program Funding Summary

C. Acquisition Strategy

The SRS kit development effort was contracted under a Small Business Innovative Research (SBIR) effort. The EMD contract was awarded 4th Quarter FY 1998 to Omnitech Robotics Incorporated. The contract is incrementally funded beginning FY 1999 through FY 2001. This contract was funded to target cost without delivery of assets. An aggressive effort is ongoing to develop an alternative plan to complete DT/OT to meet MSIII.

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
SRS			
(DEUCE)			
(T3)			
Engineering Milestones			
T&E Milestones			
SRS			
(DEUCE)			DT/OT
(T3)			
Contract Milestones			

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY EMD, DEFENSE WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z		PROJECT NAME AND NUMBER ROBOTIC COMBAT SUPPORT SYSTEM (RCSS)					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
RCSS	3.000	6.915	4.197						N/A	CONT

A. Mission Description and Budget Item Justification. The Robotic Combat Support System (RCSS) Program utilizes a 3 phase "Block" upgrade approach. "Block 0" is the Product Improved Mini-Flail (PIMF) which is an RCSS with the Anti-Personnel mine proofing and clearing payload. The PIMF has proven effective in Bosnia and Kosovo as a contingency asset. "Block 1" will be an anti-personnel obstacle clearing and neutralization system and will replace the PIMF, providing improved off-route stability, increased anti-personnel (AP) landmine neutralization speed, improved reliability, and improved human-machine interface. "Block 2" will add Anti-Personnel wire obstacle clearing, advanced controls, remotely deployed smoke and obscurants, and remotely delivered special munitions to support dismounted operations. "Block 3" will add the capability to carry soldier loads and provide hands-free control and dismounted soldier leader-follower technology. Mechanical devices will be added to "Block 2" that will be used to emplace demolitions and special breaching systems. A Mission Need Statement (MNS) has been developed and an Operational Requirements Document (ORD) has been approved by Army Training and Doctrine Command (TRADOC).

(U) FY 2000 Accomplishments

- Initiated Acquisition Documentation for Contracts Requirement Package.
- Completed Operational Requirements Document.

(U) FY 2001 Plans

- Complete Milestone A for RCSS.
- Issue Request for Proposal (RFP) for competitive procurement.
- Establish Source Selection Evaluation Board for competitive procurement.
- Receive solicitations in response to RFP.
- Evaluate contractors' proposals.
- Execute Program Definition and Risk Reduction (PDRR) contract.

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

(U) FY 2002 Plans

- Start Initial Verification Testing (IVT) on kit delivered under PDRR phase.
- Complete Milestone B.
- Award SDD contract in FY 2003.

B. Other Program Funding Summary

C. Acquisition Strategy

The RCSS contract will be awarded under full and open competition in FY 2001.

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
RCSS		MS A	MS B
Engineering Milestones			
T&E Milestones			
RCSS			IVT
Contract Milestones			
RCSS		PDRR	

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z		PROJECT NAME AND NUMBER MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM – INTERIOR (MDARS-I)					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
MDARS-I	2.000	4.000	3.000						N/A	CONT
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Mobile Detection Assessment Response System – Interior (MDARS-I) will provide unmanned physical security inside the warehouses of fixed installations and large storage facilities. In addition to security, the system will also support inventories and track movement or disturbance of critical inventory items.

(U) FY 2000 Accomplishments
- Monitored EMD System Development
- Continued Production Qualification Testing (PQT) I

(U) FY 2001 Plans
- Conduct Production Qualification Testing (PQT) II
- Conduct Limited User Test (LUT)

(U) FY 2002 Plans
- Conduct Special In Process Review (S-IPR) for Low Rate Initial Production (LRIP) decision
- Initiate Pre-Planned Product Improvement (P3I) effort

B. Other Program Funding Summary

C. Acquisition Strategy

D. Schedule Profile

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
Acquisition Milestones			
MDARS-I			S-IPR
T&E Milestones			
MDARS-I	PQT I	PQT II	
MDARS-I		LUT	
Contract Milestones			
MDARS-I			LRIP

Exhibit R-2a, RDT&E Project Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0604709D8Z		PROJECT NAME AND NUMBER MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM – EXTERIOR (MDARS-E)					
Cost ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
MDARS-E	0.000	0.000	3.000						N/A	CONT
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification. The Mobile Detection Assessment Response System – Exterior (MDARS-E) will provide unmanned roving security patrols among buildings and around perimeters of large fixed installations including warehouses, large storage facilities and ammunition facilities. In addition to security, the system will also support inventories and track movement or disturbance of critical inventory items.

(U) FY 2000 Accomplishments
- No SDD funding this fiscal year

(U) FY 2001 Plans
- No SDD funding this fiscal year

(U) FY 2002 Plans
- Award SDD Contract
- Conduct Customer Test (DT)
- Monitor the SDD Hardware Contract

B. Other Program Funding Summary

C. Acquisition Strategy

Exhibit R-2a, RDT&E Project Justification	Date: June 2001

D. Schedule Profile

Fiscal Year actual and planned events:

	FY2000	FY2001	FY2002
T&E Milestones			
MDARS-E			DT
Contract Milestones			
MDARS-E			SDD

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY		Program Element PE 0604709D8Z					SRS					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development			6.304	1.000		0.600						
Ancilliary Hardware Development			1.150	0.100		0.100						
Systems Engineering			0.350	0.100		0.100						
Liscenses												
tooling												
GFE												
Award Fees												
Subtotal Product Development			7.804	1.200		0.800						
Remarks:												
Development Support			0.496	0.400		0.200						
Software Development				0.400		0.200						
Training Development			0.300	0.100		0.100						
Integrated Logistics Support			0.200	0.050		0.050						
Configuration Management				0.050		0.050						
Technical Data				0.150		0.150						
GFE												
Subtotal Support			0.996	1.150		0.750						
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE		Program Element					SRS					
BUDGET ACTIVITY 0		PE 0604709D8Z										
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
DT				0.300		0.200						
IOT&E				0.200		0.100						
User Appraisal			0.200									
Subtotal T&E			0.200	0.500		0.300						
Remarks:												
Contractor Engineering Support				0.400		0.400						
Government Engineering Support			0.125	0.100		0.100						
Program Management Support			0.320	0.150		0.150						
Program Management Personnel				0.100		0.100						
Travel			0.100	0.100		0.100						
Labor (Research Personnel)				0.200		0.200						
Miscellaneous				0.100		0.100						
Subtotal Management			0.545	1.150		1.150						
Remarks:												
Total Cost			9.545	4.000		3.000						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 5		Program Element PE 0604709D8Z					RCSS					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date	2003 Cost	2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	OST		4.648		1.100						
Ancilliary Hardware Development												
Systems Engineering			2.000	1.000		0.700						
Liscenses						0.700						
tooling		TACOM		0.100								
GFE												
Award Fees												
Subtotal Product Development			2.000	5.748		2.500						
Remarks:												
Development Support				0.100		0.500						
Software Development			0.500	0.100		0.123						
Training Development				0.100								
Integrated Logistics Support				0.100								
Configuration Management				0.100								
Technical Data												
GFE												
Subtotal Support			0.500	0.500		0.623						
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 0		Program Element PE 0604709D8Z					RCSS					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
DT				0.267		0.300						
IOT&E												
User Appraisal												
Subtotal T&E				0.267		0.300						
Remarks:												
Contractor Engineering Support				0.100		0.074						
Government Engineering Support			0.500	0.100		0.700						
Program Management Support				0.200								
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Miscellaneous												
Subtotal Management			0.500	0.400		0.774						
Remarks:												
Total Cost			3.000	6.915		4.197						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 5		Program Element PE 0604709D8Z					MDARS-I					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development			1.000	0.600								
Ancilliary Hardware Development												
Systems Engineering				0.400		1.500						
Liscenses												
tooling												
GFE												
Award Fees												
Subtotal Product Development			1.000	1.000		1.500						
Remarks:												
Development Support				0.255								
Software Development			0.150	0.200		0.623						
Training Development				0.050								
Integrated Logistics Support			0.100	0.295								
Configuration Management				0.350								
Technical Data												
GFE												
Subtotal Support			0.250	1.150		0.623						
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 0		Program Element PE 0604709D8Z					MDARS-I					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
DT			0.300	0.650								
IOT&E				0.750								
User Appraisal												
Subtotal T&E			0.300	1.400								
Remarks:												
Contractor Engineering Support			0.100	0.150								
Government Engineering Support			0.150	0.150		0.877						
Program Management Support			0.200	0.150								
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Miscellaneous												
Subtotal Management			0.450	0.450		0.877						
Remarks:												
Total Cost			2.000	4.000		3.000						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 5		Program Element PE 0604709D8Z					MDARS-E					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
Ancilliary Hardware Development												
Systems Engineering						1.300						
Liscenses												
tooling												
GFE												
Award Fees												
Subtotal Product Development						1.300						
Remarks:												
Development Support												
Software Development						0.423						
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support						0.423						
Remarks:												

Exhibit R-3 Cost Analysis (page 2)							Date:	June 2001				
DEFENSE-WIDE BUDGET ACTIVITY 0		Program Element PE 0604709D8Z					MDARS-E					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 2000 Cost	2001 Cost	2001 Award Date	2002 Cost	2002 Award Date			Cost To Complete	Total Cost	Target Value of Contract
DT						0.550						
User Appraisal												
Subtotal T&E						0.550						
Remarks:												
Contractor Engineering Support												
Government Engineering Support						0.727						
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Miscellaneous												
Subtotal Management						0.727						
Remarks:												
Total Cost						3.000						
Remarks:												

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P771/P773

COST *(In Thousand)*	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total Cost
Total Program Element (PE) Cost	29,336	16,100	16,572						Cont.
LINK-16 - P771	4,192	4,025	8,971						Cont.
Multifunctional Information Distribution System-Low Volume Terminal (MIDS-LVT) - P773	25,144	12,075	7,601						

A. Mission Description and Budget Item Justification

This program funds ongoing system level engineering of the existing Link 16 system for joint interoperability and the development of the next generation Link 16 system, the Multifunctional Information Distribution System (MIDS). System level engineering responsibilities include Link 16 spectrum issues and Link 16 joint enhancements. Spectrum issues include system engineering, testing, maintaining necessary equipment, performing DoD internal and external coordination and platform integration/certification required to coexist and operate in the Air Radio Navigation Safety frequency band. Joint enhancements planned for Link 16 include Joint Range Extension (JRE), Dynamic Network Management (DNM), Time Slot Reallocation (TSR), Gateways, Joint Interface Control Officer (JICO) Toolset, Relative Navigation, Link 16 Weapons Applications and improvements to Link 16 Track Quality, Time Slot Synchronization, Target Correlation/Decorrelation, Geodetic Data Registration, Common Time Reference, and Combat ID. MIDS is a joint and international cooperative program involving U.S., France, Italy, Germany and Spain. Designed for tactical combat applications and environments, MIDS will provide a highly jam-resistant, secure digital (voice and data) information distribution system, enabling rapid integrated communications, navigation, and identification among tactical and command and control warfare elements. The MIDS-Low Volume Terminal (LVT) will make Link 16 more affordable for a larger population of U.S. platforms and systems and will be interoperable with previously developed and produced Link 16 equipment, JTIDS Class 1 and 2. Affordability is being achieved through the implementation of open and commercial architecture standards and parts that will allow the tailoring of production configurations to the minimum needs of different U.S. platforms and missions. This program funds the U.S. cost share of MIDS development, fabrication, and test of EMD terminals and terminal level pre-operational support for U.S. platforms which are implementing MIDS.

This program is funded under BA-5, Engineering and Manufacturing Development, because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P771/P773

B. Program Change Summary - See individual project R-2 pages

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P771

COST *(In thousands)*	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total Cost
LINK-16 - P771	4,192	4,025	8,971						Cont.

A. Mission Description and Budget Item Justification

This program funds ongoing system level engineering of the existing Link 16 system for joint interoperability and the development of the next generation Link 16 system, the Multifunctional Information Distribution System (MIDS). System level engineering responsibilities include Link 16 spectrum issues and Link 16 joint enhancements. Spectrum issues include system engineering, testing, maintaining necessary equipment, performing DoD internal and external coordination and platform integration/certification required to coexist and operate in the Air Radio Navigation Safety frequency band. Joint enhancements planned for Link 16 include Joint Range Extension (JRE), Dynamic Network Management (DNM), Time Slot Reallocation (TSR), Gateways, Joint Interface Control Officer (JICO) Toolset, Relative Navigation, Link 16 Weapons Applications and Improvements to Link 16 Track Quality, Time Slot Synchronization (TSS), Target Correlation/Decorrelation, Geodetic Data Registration, Common Time Reference, Time Critical Strike (TCS) and Combat ID.

PROGRAM ACCOMPLISHMENTS AND PLANS

1. FY 2000 ACCOMPLISHMENTS

Continued Link 16 ($4.192 million)

- Closed the four remaining major Spectrum management issues.
- Continued spectrum management efforts, including testing, associated with receiving and maintaining frequency certification.
- Continued Link 16 technical support and support for international users.
- Continued Link 16 development/analysis/enhancements for increased operational requirement.
- Initiated technical oversight, planning, and Joint Service Coordination of Link 16 enhancements including Dynamic Network Management, Joint Range Extension and Joint Interface Control Officer Toolset.
- Updated/restructure STANAG 4175 incorporating approved data link change proposals and changes in support of MIDS terminal development.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P771

2. FY 2001 PLANS

Continue Link 16 ($4.025 million)

- Obtain final spectrum Certification.
- Continue spectrum management efforts, including testing, associated with receiving and maintaining frequency certification.
- Continue Link 16 technical upgrade and support for international users.
- Continue technical oversight, planning, and Joint Service Coordination of Link 16 enhancements including Dynamic Network Management, Joint Range Extension and Joint Interface control Officer Toolset Support System (JSS).

3. FY 2002 PLANS

Continue Link 16 ($8.971 million)

- Continue spectrum management efforts, including testing associated with receiving and maintaining frequency certification.
- Continue Link 16 technical upgrade and support for international users.
- Continue technical oversight, planning, and Joint Service Coordination of Link 16 enhancements including Dynamic Network Management, Joint Range Extension, Joint Interface Control Officer Toolset Support System (JSS), and Missile Tactical Terminals.
- Initiate Joint service coordination for all Link 16 track quality, Time Slot Synchronization, Target Correlation/Decorrelation, Geodetic Data Registration, Common Time Reference Time Critical Strike, Gateways and Combat ID.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P771

B. Program Change Summary

	FY 2000	FY 2001	FY 2002	Total Cost
Previous President's Budget Submit Appropriated Value	4,192	4,047		Cont.
Adjustments to Appropriated Value				
a. Congressional Reduction		(22)		
President's Budget Submit	4,192	4,025	8,971	Cont.

Change Summary Explanation:

Funding: The decrease in FY 2001 is due to Congressional Reduction.

Schedule: N/A

Technical: N/A

C. Other Program Funding Summary

Not Applicable

D. Schedule Profile

Not Applicable

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P773

COST *(In Thousands)*	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total Cost
MIDS – P773	25,144	12,075	7,601						

A. Mission Description and Budget Item Justification

The Multifunctional Information Distribution System (MIDS) Low-Volume Terminal (LVT) is a U.S. joint and international (U.S., France, Germany, Italy, and Spain) cooperative program to develop and produce the next generation LINK-16 system. Designed for tactical combat applications and environments, MIDS will provide a highly jam-resistant, secure, digital (voice and data) information distribution system, enabling rapid integrated communications, navigation, and identification among tactical and command and control warfare elements. Affordability is being achieved through the implementation of open and commercial architecture standards and parts which will allow the tailoring of production configurations to the minimum needs of different U.S. platforms and missions. MIDS-LVT will be interoperable with the earlier generations of LINK-16 equipment, JTIDS Class 1 and 2. This Program Element will fund the U.S. cost share of development, fabrication and test of EMD terminals, and terminal level pre-operational support for U.S. platforms which are implementing MIDS. This element also funds preparations for competitive production. This element does not include the qualification and procurement of a MIDS variant for the F-15 which is called Fighter Data Link (FDL); the FDL is funded as an F-15 program element.

PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- Completed MIDS EMD ($24.352)
  - Completed MIDS EMD Contract performance, with the exception of contract close-out activity planned through FY 01.
  - Continued F/A-18 Initial Developmental and Operational Test & Evaluation terminal support.
  - Continued F/A-18 flight testing support.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P773

- Achieved MIDS LRIP Lot 1 DAB decision.
- Established Systems Engineering and Integration (SE&I) support capabilities for EMD terminals and platform test, installation, and integration requirements.
- Established software support capability for MIDS International Program, under SE&I contract.
- Continued management support of the International Program Office.
- Continued Electromagnetic compatibility demonstrations to support spectrum certification.
- Initiated correction of EMD deficiencies resulting from development and operational testing (contractor and government).
- Initiated retrofit of MIDS EMD terminals to -22 configuration baseline.
- Finalized and released MIDS Production RFP for the production requirements.
- Awarded and definitized two sole source letter contracts to U.S. production contractors for LRIP.
- Completed Supplement 3 negotiations.

2. FY 2001 PLANS:

- EMD Terminal and Platform Integration Support ($12.075)
  - Complete integration, testing, and delivery of EMD terminals and refurbish CDT&E terminals.
  - Complete initial at-sea Developmental Test (DT) and Operational Assessment (OA) for MIDS on Ship.
  - Obtain LRIP Lot 2 decision.
  - Continue F/A-18 Initial Developmental and Operational Test & Evaluation terminal support.
  - Continue F/A-18 flight testing support.
  - Continue correction of EMD deficiencies resulting from operational testing.
  - Perform redesign and regression testing of EMD terminals.
  - Continue SE&I support capabilities for EMD terminals and platform test, installation, and integration requirements.
  - Complete software enhancements/upgrades for Army terminals, LVT(2).
  - Continue software support capability and technical data support for MIDS International Program.
  - Initiate first software block cycle upgrade.
  - Support development, test, and evaluation of product improvements and enhancements.
  - Initiate Developmental Test and Evaluation terminal support for F-16.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P773

3. FY 2002 PLANS:

- EMD Terminal and Platform Integration Support ($7.601)
  - Continue F/A-18 MIDS Developmental Testing (DT).
  - Initiate Army Initial Operational Test and Evaluation for LVT(2).
  - Achieve Army Initial Operational Capability for LVT(2).
  - Continue correction of EMD deficiencies resulting from operational testing and evaluation.
  - Continue supporting development, test and evaluation of product improvements and enhancements.
  - Continue the SE&I support capabilities for EMD terminals and platform test, installation, and integration requirements.
  - Perform redesign and regression testing of EMD terminals.
  - Continue Developmental Testing (DT) for MIDS on Ship.
  - Continue Developmental Test and Evaluation terminal support for F-16.
  - Initiate Force Deployment Evaluation for F-16.

B. Program Change Summary

	FY 2000	FY 2001	FY 2002	Total Cost
Previous President's Budget Submit	25,216	12,203	7,507	Cont.
Adjustments to Appropriated Value				
a. Congressional Adjustments	(72)	(128)		
Net			94	
President's Budget Submit	25,144	12,075	7,601	Cont.

Change Summary Explanation:

Funding: Funding adjustments reflect Congressional reductions of $72k in FY 2000 and $128k in FY 2001 and an increase of $94k in FY 2002.

Schedule: N/A
Technical: N/A

	June 2001

APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE
RDT&E, Defense-Wide/BA-5	Common Joint Tactical Information 0604771D8Z/P773

C. Other Program Funding Summary

	FY2000	FY2001	FY2002	Total Cost
Procurement:				
APN				
BLI 052500	35,500	25,200	23,500	Cont.
BLI 014500	15,400			Cont.
OPN				
BLI 261400				Cont.
APF				
PE0207134F/PE0207130F	45,314	18,000		Cont.
PE0207133F		13,600	35,100	Cont.
Proc, DW				
PE0208864C/5C		4,700	2,900	Cont.
PE0208861C				Cont.
Related RDT&E				
PE0205604N	39,197	20,500	21,100	Cont.
PE0207133F	3,700			3,700

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/BA-5	R-1 ITEM NOMENCLATURE Common Joint Tactical Information 0604771D8Z/P773

D. Acquisition Strategy

USD(AT&L) approved the FY00 procurement of MIDS terminals based on the favorable LRIP DAB review on 27 April 2000. The approval included procurement of 70 MIDS terminals and associated spares and an additional 11 terminals for emergent lab and test requirements. This decision is consistent with the Acquisition Strategy Report (ASR) approved by USD(AT&L) in November 1999. The FY00 MIDS LRIP terminals were equitably split between the two US-led contracts. FY01 and out-year quantities will be competitively procured. USD(AT&L) has directed that after completion of the US-led and European-led MIDS terminal production qualification efforts, the production requirements of all MIDS participants will be combined and competed among the US and European qualified MIDS manufacturers.

E. Schedule Profile cont.

	FY 2000	FY 2001	FY 2002
Program	LRIP Lot 1 3Q/00	Supp 3 1Q/01 LRIP Lot 2 Decision 3Q/01	
Milestones			
EMD Contract			
Deliveries:	MIDS SW V4.2 3Q/00 Navy Terminals 3Q/00 Army Terminals 3Q/00		
System Engineering & Integration	Contract Award 3Q/00		
Deliveries:			S/W BC Upgrade 2Q/02
T & E Milestones			
Ships		DT/OA 3Q/01	
F/A-18			TECHEVAL/OPEVAL Continue >>
Army			IOT&E 2Q/02
F-16			DT&E Continue >>

EXHIBIT R-3, FY 2002/2003 RDT&E, DW PROJECT COST ANALYSIS DATE: June 2001

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771D8Z PROJECT NUMBER: P771

PROJECT TITLE: COMMON JOINT TACTICAL INFORMATION

Exhibit R-3 Cost Analysis (page 1)								Date: June 2001				
APPROPRIATION: RDT&E, DW BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604771D8Z					COMMON JOINT TACTICAL INFORMATION				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
LINK-16 Spectrum Support		Various	9.498	.171	Various							
LINK-16 Engineering Support		Various	3,124	3.414	Various	1.800	Various			Cont.	Cont.	Cont.
LINK-16 Support		Various	3.982									
LINK-16 Enhancements		Various	.426	.200								
LINK-16 Missile Tactical Terminals						1.000	Various			Cont.	Cont.	Cont.
Gateways						2.000	Various			Cont.	Cont.	Cont.
Dynamic Network Management						1.300	Various			Cont.	Cont.	Cont.
LINK-16 Technical Upgrade		Various				2.371	Various			Cont.	Cont.	Cont.
JICO Toolset (JSS)		Various	.289	.240	Various	.500	Various			Cont.	Cont.	Cont.
Subtotal Product Development			17.319	4.025		8.971				Cont.	Cont.	Cont.
Remarks:												
Total Cost			17.319	4.025		8.971				Cont.	Cont.	Cont.

EXHIBIT R-3, FY 2000/2001 RDT&E, DW PROJECT COST ANALYSIS DATE: June 2001

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771D8Z PROJECT NUMBER: P773

PROJECT TITLE: COMMON JT TACTICAL INFO

Exhibit R-3 Cost Analysis (page 1)											Date: June 2001		
APPROPRIATION: RDT&E, DW BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604771D8Z/P773								COMMON JT TACTICAL INFORMATION		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Development												
Primary Hardware/Software Development	CPIF	MIDSCO Wayne, NJ	191.812	0		0				0	191.812	196.590
Pre-operation EMD Terminal Support	CPIF	MIDSCO Wayne, NJ	2.706	0		0				0	2.706	2.706
Software Support	FFP	BAE Systems Wayne, NJ	0	2.600	Mar 01	2.338	Nov 01			Cont.	4.938	
Subtotal Product Development			194.518	2.600		2.338				0	199.456	
Remarks: The MIDSCO EMD contract period of performance ended 30 June 2000, with the exception of contract close-out activity. A new System Engineering and Integration contract was awarded in June 2000 to complete unfinished EMD work scope and to provide continued EMD terminal support.												
Support Costs												
Production Readiness Agreements Mfg Prototyping	FFP	Allied Signal Teterboro, NJ	3.189	0		0				0	3.189	3.189
Production Readiness Agreements Mfg Prototyping	FFP	Viasat Carlsbad, CA	6.346	0		0				0	6.346	6.346
Production Readiness Agreements Mfg Prototyping	FFP	Data Link Solutions Cedar Rapids, IA	1.000	0		0				0	1.000	1.000
Production Readiness Agreements	FFP	Thompson-CSF Colombes Cedex, France	1.000	0		0				0	1.000	1.000
Production Readiness Agreements	WX	SSC SD San Diego, CA	.795	0		0				0	.795	.795
Subtotal Support			12.330	0		0				0	12.330	12.330

EXHIBIT R-3, FY 2000/2001 RDT&E, DW PROJECT COST ANALYSIS DATE: June 2001

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771D8Z PROJECT NUMBER: P773

PROJECT TITLE: COMMON JT TACTICAL INFO

Exhibit R-3 Cost Analysis (page 2)											Date: June 2001	
APPROPRIATION: RDT&E,DW BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604771D8Z/P773								COMMON JOINT TACTICAL INFORMATION	
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY 01 Cost	FY 01 Award Date	FY02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation												
System Engineering	WX	SSC SD – Code 64 San Diego, CA	6.800	.027	Sep 01	.067	Jan 02			0	6.894	6.894
System Engineering	WX	SSC SD – Code 45 San Diego, CA	9.270	.049	Sep 01	.149	Jan 02			0	9.468	9.468
Software Support	MIPR	Warner Robins Robins AFB, GA	2.062	.017	Sep 01	.430	Jan 02			0	2.509	2.509
System Engineering	MIPR	MITRE Ft. Monmouth, NJ	1.939	.533	Oct 01	.550	Oct 02			0	3.022	3.022
System Engineering, and Integration	FFP	BAE Systems Wayne, NJ	5.933	8.349	Various	3.492	Various			0	17.774	17.774
System Engineering	Various	Various	15.182	.075	Jan 01	.200	Jan 02			0	15.457	15.457
Subtotal T&E			41.186	9.050		4.888				0	55.124	55.124
Remarks												
Management Services												
Program Management Support	FFP	Vredenburg Carlsbad, VA	2.306	0		0				0	2.306	2.306
Miscellaneous Program Support	FFP/ WX/PD	Various	9.897	.425	Jan 01	.375	Jan 02			0	10697	10.697
Contract Services	MIPR	AF Pentagon Washington, DC	1.400	0		0				0	1.400	1.400

Subtotal Management			13.603	.425		.375				0	14.403	14.403

Exhibit R-3 Cost Analysis (page 3)											Date: June 2001	
APPROPRIATION: RDT&E,DW BUDGET ACTIVITY : 5			PROGRAM ELEMENT: 0604771D8Z/P773								COMMON JOINT TACTICAL INFORMATION	
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY 01 Cost	FY 01 Award Date	FY02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Total Cost			**261.637**	**12.075**		**7.601**						

Remarks

AWARD FEES

The award fee on contract has been reduced from $15.7 million to $8.2 million due to recognition that the contractor's performance does not support award fee payout at the amount originally established. After this reduction, the U.S. share of the entire Award Fee on contract is approximately $3.4 million. Contractor performance earned one award fee payment in June 1995, of which the US share was $471,582 and one award fee payment for the period ending November 1995, of which the US share was $101,120. The percentage of award fee paid based on the reduced fee amount of $8.2 million is approximately 29%. The percentage of award fee paid based on the original fee amount of $15.7 million is 17%.

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 5					R-1 ITEM NOMENCLATURE Information Technology/Cost Accounting Prototypes – PE: 0605013D8Z					
COST *($ In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	12.629	0	0	0	0	0	0	12.629	12.629

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(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT: Most of the Department's current accounting systems and processes were designed primarily to provide budgetary accounting information and reports required by the Congress and the Office of Management and Budget. Consequently, many of these systems do not satisfy current cost accounting information requirements recently imposed on all federal government agencies nor meet the Department's management needs for cost information in support of more cost effective decisions. The program supports an initiative to improve cost accounting capabilities within the Department. The program will support cost accounting pilots to improve: (1) the accumulation and identification of cost information, (2) the analysis of cost information for making more cost effective decisions, (3) visibility of the cost of operations and programs and (4) delivery of relevant and reliable information to program managers in a way that better relates costs to outputs and activities.

PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2000 Accomplishments:

(U) FY 2000 Plans:

(U) FY 2001 Plans:

- Initiate cost accounting pilots with the United States Transportation Command, the Air Force Mobility Command, the Air Force Material Command (Information Services Activity Group) and the Office of the Under Secretary of Defense (Comptroller).

- Assess and evaluate the results of these cost accounting initiatives to determine the feasibility of potential future cost accounting initiatives.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 5	R-1 ITEM NOMENCLATURE Information Technology/Cost Accounting Prototypes – PE: 0605013D8Z

(U) B. Program Change Summary

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	0	12,000	0	12,000
Appropriated Value				
Congressional Directed Transfer				
Adjustments to Appropriated Value/Transferred Amount				
a. Congressional realignment		750		750
b. Congressionally Directed Undistributed Reductions		-121		-121
c. Other (DOD Program Changes)				
President's Budget Submission	0	12,629	0	12,629

(U) Funding: New Program in FY 2001

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. Other Program Funding Summary: Not Applicable

(U) D. Acquisition Strategy: Not Applicable

(U) E. Schedule Profile: Not Applicable

Exhibit R-2/R-2a, RDT & E Budget Item Justification								JULY 2001	
Appropriation/Budget Activity ENGINEERING AND MANUFACTURING DEVELOPMENT DEFENSE WIDE, BUDGET ACTIVITY 5					Item Nomenclature Financial Management Improvement System PE 0605016D8Z				
Cost ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	1.0*	100.0						Continuing	Continuing

A. Mission Description and Budget Item Justification

BRIEF DESCRIPTION OF ELEMENT

This program element is to provide funding for the development and design of a Department of Defense (DoD) wide financial management system architecture. This architecture is planned to be used in guiding the modernization of the financial management systems currently in use within the Department, to correct existing deficiencies and to improve financial and related nonfinancial feeder systems. (Nonfinancial feeder systems include, but are not limited to, those in support of acquisition, medical, transportation, property, inventory, supply, personnel and other functions that provide (or feed) financial information to the Department's financial systems.) The new architecture is a high priority for the Secretary of Defense and is required for the Department to have timely, accurate and reliable financial data for use in making effective management decisions and achieving favorable audit opinions on financial statements.

Program Accomplishments and Plans/New Starts:

FY 2001 Accomplishments:

* Funds to initiate this effort were not included in the FY 2001 budget but have been included in the FY 2001 Omnibus Reprogramming request. These funds will be used only if approved by Congress.

Exhibit R-2/R-2a, RDT & E Budget Item Justification	JULY 2001

FY 2002 Plans:

1. (25,900) Develop a Department-wide architecture to guide financial management modernization and reform efforts. The resulting architecture is planned to be used to manage financial management systems and business operations across the DoD Components, clearly defining organizational business relationships and functions, and defining technical solutions for the Department's integrated financial management network.
2. (28,200) Define standard Department-wide data requirements and develop a plan for implementing such standard data requirements. Currently, DoD Components do not employ standard financial management data elements and definitions within their various systems. By defining and implementing DoD-wide standard data requirements, the Department's financial management systems—as modified and implemented in accordance with the DoD-wide architecture—is expected to increase and provide more efficient interoperability and generate more reliable, consistent and relevant management information.
3. (30,200) Document (i.e., map) the flow of financial management transaction data from origin to financial and other management reports. In order to better ensure the reliability, relevance and consistency of financial data used by DoD managers and decision makers, it is essential that such data be subjected to adequate internal controls and processed in accordance with applicable federal and DoD standards. By defining management data requirements and documenting the flow of financial data and the processes that impact such data, the Department expects to be in a position to greatly enhance the quality and veracity of its management information.
4. (15,700) Develop and implement a process for achieving compliance in the Department's financial and nonfinancial (feeder) systems. Currently, most of the Department's financial management and critical feeder systems do not satisfactorily meet pertinent federal requirements. By bringing its systems into compliance with applicable federal management requirements, the Department expects to be in a position to reduce systems operating costs, generate more reliable data for managers and decision-makers, and achieve more favorable audit opinions on its financial statements.

B. Program Change Summary	FY2000	FY2001	FY 2002
Previous President's Budget	0	0	0
Appropriated Value	0	0	100.0
Congressional Directed Transfer	0	0	0
Adjustment to Appropriated Value/Transferred Amount	0	0	0

Exhibit R-2/R-2a, RDT & E Budget Item Justification			JULY 2001
a. Congressional realignment	0	0	0
b. Congressionally Directed Undistributed Reductions	0	0	0
c. Other (DoD Program Changes)	0	1.0	0

Current Budget Submit/President's Budget

Funding: New Program in FY 2002

Schedule: Perform studies and design work in FY 2002.

Technical: Not Applicable

C. Other Program Funding Summary: N/A

D. D. Acquisition Strategy: The strategy will be to contract with the private sector for required effort, to include public accounting firms.

Exhibit R-3, RDT & E, DW Project Cost Analysis			Date: July 2001
APPROPRIATION: RDT&E, BUDGET ACTIVITY: 5	PROGRAM ELEMENT: 0605016D8Z	FINANCIAL MANAGEMENT IMPROVEMENT SYSTEM	

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Develop Architecture	TBD	TBD*		0	N/A	1.0	8/01	25.9	TBD			
Data Standardization	TBD	TBD*		0	N/A	0	N/A	28.2	TBD			
Document Flow	TBD	TBD*		0	N/A	0	N/A	30.2	TBD			
System Compliance	TBD	TBD*		0	N/A	0	N/A	15.7	TBD			

* Office of the Under Secretary of Defense (Comptroller) will be the overseeing agency, however, most of the effort will be accomplished by contract.

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE, BUDGET ACTIVITY 6					R-1 ITEM NOMENCLATURE Unexploded Ordnance Detection & Clearance - PE 0603858D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total PE Cost	1.188	1.194	1.165						Continuing	Continuing
Program Specifics										

A. Mission Description and Budget Item Justification.

This program element funds the Joint Unexploded Ordnance Coordination Office (JUXOCO) of the Unexploded Ordnance Center of Excellence (UXOCOE) to develop policy and provide oversight in coordinating requirements and technology in detection and clearance of unexploded ordnance (UXO) within the Department of Defense (DoD), as well as with other United States and international agencies, academia, and industry; to establish and maintain standards for testing, modeling, and the evaluation of unexploded ordnance detection and clearance technology; and to establish, gather, and maintain a database of the results of these efforts.

In response to a request from the House National Security Committee (HNSC) and concerns of the General Accounting Office (GAO), the Department of Defense submitted a plan in March 1997, “Report to Congress: Unexploded Ordnance Clearance: A Coordinated Approach to Requirements and Technology Development.” This report was developed by a joint, inter-agency task force comprised of the proponents of the unexploded ordnance (UXO) clearance mission areas (active range clearance, humanitarian demining, countermine, explosive ordnance disposal, and environmental remediation). The report defined research and development priorities, program management, and cooperative activities for technology applicable to area ordnance clearance, also known as UXO clearance. The report also described a plan to maintain visibility over and leverage technology efforts within DoD, at other government agencies, and in private industry for the detection, neutralization, and disposal of UXO. In May 1997, the Under Secretary of Defense for Acquisition and Technology directed the establishment of the UXO Center of Excellence (UXOCOE) to implement this plan, and in October 1997, the Department established the operational arm of the UXOCOE, the Joint UXO Coordination Office (JUXOCO), which is collocated with the Night Vision Electronic Sensors Directorate at Ft. Belvoir, VA.

(U) FY 2000 Accomplishments

- Fully integrated industry requirements for UXO clearance equipment into UXO requirements process. ($0.100 Million)
- Established protocols for evaluation of foreign UXO detection sensor data. ($0.100 million)
- Collocated two UXO experimental areas with existing UXO testing areas. Conducted scientific experiments to gather data on the performance of detection sensors at these locations. ($0.888 million)
- Updated and maintained the UXO clearance/detection database and computer website to promote interaction

and sharing of information, concepts and technology within DoD and with other US and international agencies, academia, and industry. ($0.100 Million)

(U) FY 2001 Plans

- Conduct requirements and technology workshops to coordinate and improve the efficiency of technological thrusts for DoD UXO RDT&E. ($0.120 million)
- Coordinate / collect UXO RDT&E information by attending external conferences, seminars and workshops. (0.080 million)
- Analyze UXO RDT&E data and information collected during requirements and technology workshops, which include: Resource Managers Meeting, Multi-University Research Initiatives (MURI) Conference, ESTCP/SERDP Conference, Joint Robotics Program Workshops, etc. ($0.100 million)
- Generate an Annual UXO Clearance Report focused on the coordination of all UXO RDT&E efforts among five mission areas (Explosive Ordnance Disposal, Humanitarian Demining, Countermine, UXO-Environmental Remediation, and Active Range Clearance). (0.238 million)
- Analyze worldwide efforts in UXO RDT&E to expand JUXOCO's frame of reference into potential solutions. (0.100 million)
- Continue to update and maintain the UXO clearance / detection databases and computer web site to promote interaction and sharing of information, concepts and technology within DoD, and with other US and international agencies, academia, and industry. (0.100 million)
- Integrate international and industrial research and equipment into an expanded computerized database of UXO RDT&E to enhance information sharing. (0.100 million)
- Promote industry and academic involvement (both US and foreign) in UXO clearance RDT&E. (0.100 million)
- Coordinate standardized scientific experiments to gather data on the performance of detection sensors at JUXOCO's pilot site located at Ft. A.P. Hill. (0.156 million)
- Collect, analyze and post detection sensor data on the web site for dissemination and use by researchers in detection, signal processing, and algorithm development. (0.100 million)

(U) FY 2002 Plans

- Conduct requirements and technology workshops to coordinate and improve the efficiency of technological thrusts for DoD UXO RDT&E. ($0.120 million)
- Coordinate / collect UXO RDT&E information by attending external conferences, seminars and workshops. (0.080 million)
- Analyze UXO RDT&E data and information collected during requirements and technology workshops, which include: Resource Managers Meeting, Multi-University Research Initiatives (MURI) Conference, ESTCP/SERDP Conference, Joint Robotics Program Workshops, etc. ($0.100 million)

Exhibit R-2, RDT&E Budget Item Justification | Date: June 2001

- Generate an Annual UXO Clearance Report focused on the coordination of all UXO RDT&E efforts among five mission areas (Explosive Ordnance Disposal, Humanitarian Demining, Countermine, UXO-Environmental Remediation, and Active Range Clearance). (0.200 million)
- Analyze worldwide efforts in UXO RDT&E to expand JUXOCO's frame of reference into potential solutions. (0.100 million)
- Continue to update and maintain the UXO clearance / detection databases and computer web site to promote interaction and sharing of information, concepts and technology within DoD, and with other US and international agencies, academia, and industry. (0.100 million)
- Integrate international and industrial research and equipment into an expanded computerized database of UXO RDT&E to enhance information sharing. (0.100 million)
- Promote industry and academic involvement (both US and foreign) in UXO clearance RDT&E. (0.100 million)
- Coordinate standardized scientific experiments to gather data on the performance of detection sensors at JUXOCO's pilot site located at Ft. A.P. Hill. (0.165 million)
- Collect, analyze and post detection sensor data on the web site for dissemination and use by researchers in detection, signal processing, and algorithm development. (0.100 million)

B. Program Change Summary ($ million)

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	1.226	1.204	1.165	Continuing
Appropriated Value				
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction		(0.008)		
b. Congressionally Directed Undistributed Reduction				
c. Program Adjustment	(0.038)	(0.002)		Continuing
Current Budget Submit/President's Budget	1.188	1.194	1.165	Continuing

Change Summary Explanation:
Funding: N/A
Schedule: N/A

Technical: N/A

C. Other Program Funding Summary
Not Applicable

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

D. Acquisition Strategy

Not Applicable

E. Schedule Profile

Not Applicable

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001

BUDGET JUSTIFICATION
FOR PROGRAM ELEMENTS OF THE
OSD RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE-WIDE PROGRAM
FY 2002 AMENDED BUDGET SUBMISSION

PE 0604943D8Z, Thermal Vicar, program is submitted separately as a Special Access Program.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE June 2001
APPROPRIATION/BUDGET ACTIVITY Research, Development, Test & Evaluation, Defense-wide				R-1 ITEM NOMENCLATURE Technical Studies, Support & Analysis PE 0605104D				
COST (In Millions)		FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Total Program Element (PE) Cost		27.902	30.315	33.805					
P421 Tech Studies, Support & Analysis		27.902	30.315	33.805					

A. Mission Description and Budget Item Justification

BRIEF DESCRIPTION OF ELEMENT: This program element is classified in Budget Activity 6 (Management Support) because it is the primary source of funding for the Office of the Secretary of Defense and the Joint Staff for studies, analyses, management, and technical support efforts, to improve and support policy development, decision-making, management and administration of DoD programs and activities. Specific projects address a variety of complex issues and dynamic problems facing the Under Secretary of Defense for Acquisition, Technology & Logistics [USD(AT&L)], the Under Secretary of Defense for Policy [USD(P)], Under Secretary of Defense for Personnel and Readiness [USD(P&R)], Assistant Secretary of Defense for Command, Control, Communications and Intelligence [ASD(C3I)], Director for Program Analysis and Evaluation (DPA&E), the Joint Staff and Unified Command Commanders. Studies and analyses will examine the implications and consequences of current and alternative policies, plans, operations, strategies and budgets, and are essential for understanding and gaining insight into the complex multifaceted international, political, technological, economic, military, and acquisition environments in which defense decisions and opportunities take place. With our need to better understand and cope with the threats and uncertainties facing the Nation in the current economic environment, the need for objective analyses and forward-looking planning for the mid and long-range (at acceptable near-term risk) becomes greater.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

PROGRAM ACCOMPLISHMENTS AND PLANS:

General Support for USD (ACQUISITION, TECHNOLOGY & LOGISTICS):

FY 2000 Accomplishments

- Reviewed Unmanned Aerial Vehicle (UAV) programs to assess progress against SECDEF UAV vision letter; identified program strengths and weaknesses in technical, programmatic, and fiscal areas; and recommended policy, funding, or process changes to improve the management and execution of these UAV programs.
- Conducted analysis of requirements and options for theater air and ballistic missile defense systems and architectures.
- Accessed cost and schedule impacts of applying varying levels of stealth technologies to tactical aircraft, tactical missiles, UAVs, and Uninhabited Combat Air Vehicles (UCAVs).
- Defined the components of the Tactical Air Battle, Space Beneath an Overcast Sky problem and postulated possible solutions.
- Supported technical analyses of C-5 modernization efforts.
- Compared the "as-is" state of DoD logistics with the recommendations reported in the May 1997 QDR Report. Examined key DoD logistics strategy documents such as the Logistics Strategic Plan, Joint Vision 2010 Focused Logistics
- Analyzed current logistics practices and developed specific recommendations regarding the potential incorporation of the required delivery date as a supply chain integration tool for improved secondary item management and distribution
- Analyzed weapon systems performance, cost, and schedule issues in support of acquisition milestone decisions and DoD planning, programming, and budgeting activities.
- Responded to Congressional direction to evaluate weapon systems requirements and acquisition issues, and to submit master planning documents for key defense mission areas.
- Finalized unexploded ordnance detection and neutralization strategies.
- Supported Hard & Deeply Buried Target Capstone requirements definition
- Initiated historical analysis of Base Realignment & Closure (BRAC) and a probed the base capabilities needed for the 21st century.
- Created processes to incorporate Interoperability into major weapon systems planning, programs, and decisions
- Designed/developed optimization model which minimizes total production cost of all 80 ACAT1 systems over 18-year planning horizon.
- Conducted technical analyses supporting the Reduction of Total Ownership Cost (R-TOC) initiatives.
- Provided analytical support to establish U.S. positions for ammunition stockpile guidance at NATO meetings.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Studied actual and/or perceived impediments and barriers under current Government procurement law, acquisition regulations and policies that cause commercial technology firms to avoid the Defense market place, and proposed remedies for impediments.
- Initiated research into international trends in information technology likely to impact defense systems interoperability.
- Initiated development of a framework for characterizing and prioritizing interoperability-related shortfalls and began applying it within major weapon system reviews
- Reviewed development and implementation of architectures for C4ISR systems, for interoperability objectives.
- Assisted in defining the parameters of a joint-Service Single Integrated Air Picture in a key step toward development of a Family of Interoperable Operational Pictures.
- Analyzed current capabilities, shortfalls, and operational and technical strategies DoD-wide for achieving a Family of Interoperable Operational Pictures.
- Proposed steps to review and document processes and technologies that serve as barriers or enablers to information, logistics, and business system interoperability.
- Initiated USD(AT&L) dedicated support to U.S. program integration for system developments in fulfillment of NATO objectives embodied in the Defense Capabilities Initiative.
- Supported development and implementation of Simulation Based Acquisition (SBA) within the Defense Department.
- Updated Congressionally mandated Joint Warfighting Science & Technology Plan
- Assessed DoD laboratory contributions to technology development paths creating combat and information dominance for selected major weapons systems
- Employed CALS to develop architectures to govern the modernization of integrated supply chain information systems
- Reengineered logistics processes based on CALS technologies and integrated maintenance prognostics and IETM architecture
- Identified new information system strategies that enable integrated logistics chains
- Defined and projected maintenance of cost and performance metrics for logistics systems
- Performed a comparative analysis of DoD and commercial practices and supporting research, to identify and assess potential data exchange technologies for logistics applications
- Preformed comparative analysis of current DoD processes for logistics support of mobilization and deployment
- Continued to refine and apply prototype design, methodology, and analytical plan for validating the business necessity of academic degrees for acquisition professionals by career field clusters.
- Initiated Future Workforce 2005 Taskforce, to develop initiatives to offset potential retirement of 30-50% of workforce by 2005.
- Designed and implemented two online distance/continuous learning courses.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

FY 2001 Program

- Expand on past research examining the differences in how the Services allocate Housing O&M costs. Results could lead to DoD policy using best practices, to reduce O&M costs.
- Identify operational bases for logistics change. Identify readiness/other output measures to define logistics strategic reshaping
- Identify the externalities that will continue to drive and accelerate logistics transformation (e.g., acquisition reform, commercialization, need for infrastructure reduction, etc.)requisitioning, distribution, and retrograde with new processes that have been tested in a joint operations environment
- Complete the threat and risk mitigation identification, describe the requirements for assured logistics communication, and identify the relationship between varying levels of risk and degree of assurance required
- Implement analytical applications to support QDR issue examination and recommendations; a facilitated forum to assist up to 50 mid-level to senior DoD logistics professionals in framing logistics strategy options for 2010-2020; Draft Logistics Operations and business area QDR Report; Final Logistics Operations and Business Area QDR Report
- Conduct the Competitive Sourcing/A-76 Peer Review--reengineer/improve the competitive sourcing process, benchmark current practices, expand for strategic sourcing and create standardized documents. Provide outreach recommendations to stakeholders.
- Pursue the USD(AT&L) & DepSecDef goal to eliminate inadequate military housing by 2010. Compare construction of similar housing with private sector to determine if costs/processes differ.
- During the QDR, implement a model to improve long-term (i.e., over 18-20 years) planning of defense acquisitions -- particularly portfolio affordability, stability, and schedule
- Technical support to manage and foster interoperability for the acquisition of U.S. military and coalition warfighting capability.
- Support the framework for interoperability shortfalls to develop priorities for interoperability objectives and employ them within USD (AT&L) acquisition management activities (e.g., DAES reviews, DAB).
- Plan and initiate reviews of DoD-wide systems engineering, integration, and testing activities related to system-of-system acquisitions, to evaluate and compare the success of alternative technical and management approaches for accomplishing interoperability objectives.
- Based on international trends in information technologies, characterize alternative acquisition policies within U.S. and allied/coalition countries as they might affect success in acquiring and integrating systems for joint and coalition interoperability.
- Review joint architecture development activities in support of USD(AT&L) participation the Architecture Steering Group, Architecture Control Council, and other CIO interfaces with Services and DoD agencies.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Support activities for analyzing the interoperability dimensions of military requirements presented in new Operational Requirements Documents and assessing whether the requirements as stated are adequate for producing a system that will achieve the needed interoperability.
- Review allied/coalition partner system developments and acquisition programs to assess interoperability potential and impacts.
- Continue AT&L dedicated support to U.S. program integration for system developments in fulfillment of NATO objectives embodied in the Defense Capabilities Initiative.
- Review plans for Joint Warfighting Experiments (JWEs) and Joint Warfighting Capability Assessments (JWCAs) for implementation of relevant C4ISR system architectures and demonstrations of interoperability.
- Based on processes applied in analysis of the Family of Interoperable Operational Pictures, review selected system-of-system concepts including Global Information Grid (GIG) to assess application of the Joint Technical Architecture and the extent of resulting interoperability.
- Implement steps to review and document processes and technologies DoD-wide that serve as barriers or enablers to information, logistics, and business system interoperability.
- Provide technical support for Acquisition Council, M&S based acquisition executive steering board.
- Support development of Simulation Based Acquisition (SBA) within the Defense Department.
- Conduct FY 2002 S&T strategic planning activities. Prepare Congressionally mandated Joint Warfighting S&T Plan and companion S&T planning documents.
- Continue analysis in support of laboratory improvement initiatives mandated by Congress or DoD.
- Continue research on planning manufacturing with industry in cooperation with the National Center for Advanced Technologies.
- Provide technical and engineering assistance on assigned Departmental directed Science & Technology initiatives
- Perform an analysis to recommend an improved process for logistics business areas participation in the 2001 QDR leading to a credible revised defense plan
- Update Logistics Strategic Plan based on DRID 54 results, develop and maintain a DoD logistics management initiatives database that supports the strategic plan to include Services/DLA logistics initiatives input data and PPBS data specific to these initiatives
- Implement a project management plan that will serve as the framework for these diverse efforts, and outputs will include specific recommendations for policy and resource action, as well as cooperative efforts with both Defense and industry
- Implement approaches identifying the actions necessary to move forward with workforce restructuring and remove impediments
- Analyze weapon systems performance, cost, and schedule issues in support of acquisition milestone decisions and DoD planning, programming, and budgeting activities.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Respond to Congressional direction to evaluate weapon systems requirements and acquisition issues, and to submit master planning documents for key defense mission areas.
- Finalize UAV programs to assess progress on areas specified in SECDEF UAV vision letter; identify program strengths and weaknesses to include technical, programmatic, and fiscal considerations; recommend policy, funding, or process changes to improve the management and execution of these programs.
- Finalize technical analyses supporting the Reduction of Total Ownership Cost (R-TOC) initiative(s).
- Finalize analysis of requirements and options for theater air and ballistic missile defense systems and architectures.
- Continue analytical support to establish U.S. positions for ammunition stockpile guidance at the NATO SPG meetings.
- Continue the Section 5002, Federal Acquisition Streamlining Act of 1994 required effort to review incentives and personnel actions available to SecDef to encourage excellence in acquisition management , via a balance score card process at pilot sites
- Provide follow-on analysis and execution of Future Workforce 2005 Taskforce initiatives.
- Complete independent evaluation of the requirement for future Base Realignment and Closure Rounds
- Update a relational database for decision making to improve facility management and streamline the infrastructure
- Finalize Facilities Strategic Plan and Base Structure Report and develop tools to manage facility inventory.
- Examine methods and procedures for efficient implementation of facilities management in field organizations, and develop/publish simple guidelines for distinguishing between sustainment, restoration and modernization expenses.
- Re-examine Target Replacement Life for each of the 400 facilities analysis categories to support development of PA&E-sponsored facilities aging model.
- Develop a comprehensive utilities and energy management strategy, integrating the Defense Reform Initiative goal to manage energy (not infrastructure), and privatize utilities, simultaneously with DOD's efforts to procure energy competitively and conserve energy.
- Administer the Renewable Energy Feasibility Study & Implementation Program: Supports Sec 204 of EO 13123 (Jun 99) to expand the use of renewable energy and meet the goal of tripling renewable energy capacity by 2010.
- Administer the Water Conservation Feasibility Study & Implementation Program: Supports Sec 207 of EO 13123 (Jun 99) to reduce water consumption and associated energy use in facilities.

FY2002 Plans

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Analyze weapon systems performance, cost, and schedule issues in support of acquisition milestone decisions and DoD planning, programming, and budgeting activities.
- Respond to Congressional direction to evaluate weapon systems requirements and acquisition issues, and to submit master planning documents for key defense mission areas.
- Continue analytical support to establish U.S. positions for ammunition stockpile guidance at the NATO SPG meetings.
- Technical support to manage and foster interoperability for the acquisition of U.S. military and coalition warfighting capability.
- Support the framework for interoperability shortfalls to develop priorities for interoperability objectives and employ them within USD(AT&L) acquisition management activities (e.g., DAES reviews, DAB).
- Plan and initiate reviews of DoD-wide systems engineering, integration, and testing activities related to system-of-system acquisitions, to evaluate and compare the success of alternative technical and management approaches for accomplishing interoperability objectives.
- Based on international trends in information technologies, characterize alternative acquisition policies within U.S. and allied/coalition countries as they might affect success in acquiring and integrating systems for joint and coalition interoperability.
- Review joint architecture development activities in support of USD(AT&L) participation the Architecture Steering Group, Architecture Control Council, and other CIO interfaces with Services and DoD agencies.
- Support activities for analyzing the interoperability dimensions of military requirements presented in new Operational Requirements Documents and assessing whether the requirements as stated are adequate for producing a system that will achieve the needed interoperability.
- Review allied/coalition partner system developments and acquisition programs to assess interoperability potential and impacts.
- Continue AT&L dedicated support to U.S. program integration for system developments in fulfillment of NATO objectives embodied in the Defense Capabilities Initiative.
- Review plans for Joint Warfighting Experiments (JWEs) and Joint Warfighting Capability Assessments (JWCAs) for implementation of relevant C4ISR system architectures and demonstrations of interoperability.
- Based on processes applied in analysis of the Family of Interoperable Operational Pictures, review selected system-of-system concepts including Global Information Grid (GIG) to assess application of the Joint Technical Architecture and the extent of resulting interoperability.
- Implement steps to review and document processes and technologies DoD-wide that serve as barriers or enablers to information, logistics, and business system interoperability.
- Provide technical support for Acquisition Council, M&S based acquisition executive steering board.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Support development of Simulation Based Acquisition (SBA) within the Defense Department.
- Prepare annual update of the Congressionally mandated Joint Warfighting Science and Technology Plan and the companion science and technology planning documents.
- Continue analysis in support of laboratory improvement initiatives mandated by Congress or DoD.
- Continue research on planning manufacturing with industry in cooperation with the National Center for Advanced Technologies.
- Provide technical and engineering assistance on assigned Departmental directed S&T initiatives.
- Continue to reengineer logistics processes based on CALS technologies
- Continue to employ CALS in developing architectures to govern the modernization of integrated supply chain information systems
- Further definition of COE requirements and procedures, logistics enterprise action planning and information management policy in support of Global Combat Support System (GCSS), development of appropriate performance metrics and continued executive responsibilities for the conduct of the Logistics Information Board and subordinate Service and Agency activities
- Provide in-depth to the vision for DoD logistics in the Logistics Strategic Plan
- Develop supply chain strategies for applying commercial practices in the DoD logistics and operational environment and providing data access through "shared" data, and effective, direct support of the joint warfighter.
- Develop policies for process integration across functional and organizational boundaries.
- Identify opportunities for sharing supply chain "lessons-learned" among Component organizations
- Continue the Section 5002, Federal Acquisition Streamlining Act of 1994 required effort to review incentives and personnel actions available to SecDef to encourage excellence in acquisition management, via a balance score card process at pilot sites.
- Provide follow-on analysis and execution of Future Workforce 2005 Taskforce initiatives.

General Support for USD (POLICY)

FY 2000 Accomplishments

- Continued the development of a Near East South Asia Center for Security Studies
- Conducted assessments and analyses of NATO allies' progress toward implementing the Defense Capabilities (DCI) objectives established at the Washington Summit (ongoing effort)
- Initiated a study to evaluate the conduct of peace operations and make recommendations for improvement.
- Conducted a series of assessments of the possible impact of the use of weapons of mass destruction on CENTCOM's ability to conduct operations in southwest Asia.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

- Initiated assessments of defense/military capabilities of Albania, Macedonia, Croatia, and the Republics of Slovakia and Slovenia.
- Assessed DoD nuclear planning efforts to determine how well the employment guidance has been fulfilled; provided analysis and support for the most recent version for the Policy Guidance for the Employment of Nuclear Weapons; and reviewed nuclear weapons allocation planning and assessed the results of each plan.
- Analyzed and assessed strategies that potential adversaries could use to attack U.S. vulnerabilities across a wide range of scenarios from major theater wars to smaller-scale contingencies.
- Began effort to rigorously measure differential effect of shaping and crisis-response activities on international environment.
- Analyzed homeland defense requirements and continued efforts to integrate those requirements into broader assessments of our national defense strategy.
- Analyzed use of force options in preparation for the 2001 Quadrennial Defense Review
- Developed and explore multiple alternative frameworks for U.S. defense strategy, including the articulation of distinct regional shaping/engagement strategies and preparation for future peer, asymmetric, or ambiguous threats
- Initiated a study on the feasibility of a variety of options with regard to future infrastructure and access in the Asia-Pacific region
- Provided detailed modeling support for independent assessments of national/theater missile defense and shared early warning
- Assisted in development of smallpox research priorities with a view toward precluding the use of smallpox as a biological weapon
- Conducted a baseline review of U.S. hemispheric security policy in the Americas
- Initiated a review of the effectiveness of current "rapid assessments" which are used to plan and execute effective relief operations and make recommendations for improvements
- Initiated a study to identify DoD bilateral engagement activities that have maximum effect in enhancing foreign militaries' abilities to participate and contribute effectively to peacekeeping operations.
- Initiated a study on global demographic trends and the likely consequences for defense planning and strategy.

FY 2001 Program

- Develop strategies to respond to emerging issues in missile proliferation
- Assess the implications of likely defense missions through 2020 for force structure and defense strategy.
- Analyze the potential impact of small scale contingencies on U.S. force structure planning (continuing)
- Evaluate assumptions and shortfalls in the USG analysis of terrorist groups' infrastructure as well as the architecture centers of gravity, and the vulnerabilities of the groups themselves.

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- Continue analysis on a wide range of studies, analyses and research that will support the Department's efforts on the Quadrennial Defense Review (QDR), including alternate force structures, budget and strategy
- Continue to develop/revise existing plans to assess the chemical-biological threat, especially in CENTCOM and EUCOM
- Continue to conduct regionally-focused studies on critical issues of concern to the department.
- Continue to collect, analyze, and update statistics on a wide range of macroeconomic and defense indicators used for responsibility-sharing comparisons among NATO nations, Japan and the Republic of Korea
- Analyze the threat posed by the proliferation of weapons of mass destruction and the impact on U.S. force structure, acquisition, logistics, training, and doctrine
- Assess implementation of nuclear employment policy guidance; examine critical issues on national/theater ballistic missile defense
- Provide detailed modeling support for independent assessments of national missile defense and nuclear employment policy.
- Continue the assessment of asymmetric threats to U.S. security interests and help develop alternative U.S. strategies in accordance with the requirements of the QDR.
- Use knowledge management techniques to make DoD policies readily available to decision makers in DoD.
- Continue analyses on homeland defense issues (possible follow-on to existing study)
- Continue Continuity of Operations Planning (COOP) to develop a robust and viable program
- Continue to develop and deliver the International Program Security Requirements course
- Conduct the Interagency Terrorism Response Awareness Program (I-TRAP) (ongoing)

FY 2002 Plans

- Assess implementation of nuclear employment policy guidance and strategy (continuing)
- Provide detailed modeling support for independent assessments of national missile defense and nuclear employment policy.
- Assess and examine critical policy issues involved with national and theater ballistic missile defense (continuing)
- Analyze sensitivity of warfighting outcomes to chemical/biological issues
- Examine alternatives for countering biological warfare threats
- Evaluate notional offensive and defensive force combinations
- Examine future special operations roles and missions
- Continue to develop and hold the Interagency Terrorism Response Awareness Program (I-Trap) workshops
- Conduct regionally-focused studies on critical issues of concern to the department.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
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- Analyze the threat posed by the proliferation of weapons of mass destruction and the impact on U.S. force structure, acquisition, logistics, training, and doctrine
- Continue analyses of Military Operations in Urban Terrain
- Continue to collect, analyze, and update statistics on a wide range of macroeconomic and defense indicators used for responsibility-sharing comparisons among NATO nations, Japan and the Republic of Korea
- Continue to develop and deliver the International Program Security Requirements course
- Assess the strategic importance of African petroleum resources and identify what steps DoD might take to better secure them.
- Examine alternatives for reducing the appeal of WMD in the Persian Gulf
- Continue Continuity of Operations Planning (COOP) to develop a robust and viable program
- Assess future insurgency threats to provide basis for effective special operations forces and other military planning
- Enhance DoD crisis action planning for non-combatant evacuation operations

General Support for the USD (Personnel & Readiness)

FY 2000 Accomplishments

- In support of the recruiting function, began a major effort to develop and evaluate alternate approaches to advertising, and the best means of conveying the Department's message to high quality youth.
- Continued a major, congressionally-mandated, test of the privatization of selected aspects of recruiting.
- Evaluated the effect on recruiting and retention of alternate proposals for expanding and extending the Montgomery GI Bill program for post-service educational benefits.
- Continued to assess the impact of MWR and other quality of life programs on military families, with special emphasis on the effects of major QoL programs on retention, satisfaction with military life, and spouse employment.
- Continued to develop and evaluate alternative policies to foster more effective Active/Reserve Force integration.
- Developed models and analytic tools concerning compensation and career management, to support reporting requirements and evaluation of the major new compensation structure and retirement benefits enacted as part of the National Defense Authorization Act for Fiscal Year 2000.
- Analyzed retention and quality of life issues, based on the results from the 1999 surveys of active duty personnel and spouses.
- Provided analytic support for a review of central management structure and roles of parents in the DoD Education Activity

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- Develop modeling and analytic capability to support policy decision making concerning the size, composition, and compensation structure of the DoD civilian workforce.
- Used innovative modeling efforts to compare the costs, benefits, and patient satisfaction under the Military Health System, including Tricare, with those of civilian health care insurance.

FY 2001 Program:

- Continue examining compensation issues by the 9th Quadrennial Review of Military Compensation.
- Continue modeling and analytic support for DoD recruiting / retention programs--both active duty and Reserve personnel.
- Address analytically the issues surrounding the integration of women into previously-closed military occupations.
- Conclude the rigorous modeling and evaluation of the cost-effectiveness of recently-enacted pay and allowance and retirement compensation systems, including the new choices open to retiring service members, and the new high-deployment per diem allowance that will be implemented in FY 2001.
- Continue the Congressionally-mandated test and evaluation of the privatization of selected aspects of recruiting.
- Monitor quality of life, equal opportunity and diversity of the force, and model their effects on recruitment and retention, especially on high-demand or expensive-to-train skills and specialties.
- Continue to synthesize analyses of the cost-effectiveness of the Military Health System, including Tricare, and it's effect on recruiting, retention, and the quality of life of service members.
- Conclude a major initiative to re-engineer the system of officer management, synthesizing the sometimes conflicting demands of the Defense Officer Personnel Management Act, Goldwater-Nichols, and the increasing demands of Professional Military Education in a joint-service context.
- Evaluate a demonstration of a new concept of a recruiting station, a station that is located in a shopping mall and takes maximum advantage of walk-in traffic and of new and exciting ways to appeal to the youth of today.
- Conclude the effort to better measure and understand the deployment tempo of troops in all Services, in compliance with Congressional mandates and good management practices.
- Initiate a major new effort to design new and more effective ways to manage the Department's civilian workforce, to deal with the short-term issue of a rapidly-aging workforce and the longer-term issues of how best to attract and retain high quality civilians with appropriate skills and experience.
- Continue the examination of future manning requirements in information technology.
- Address congressional mandates and directives.

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FY 2002 Plans

- Continue the effort to analyze new and more effective ways to manage the Department's civilian workforce, with special emphasis on recruiting and retaining high-quality personnel and developing more flexible management tools.
- Conclude the examination of future manning requirements in information technology.
- Conduct an in-depth assessment of the effects of personnel deployment tempo on retention, using the data-collection systems for perstempo put in place in FY 2000/2001.
- Begin systematic assessment of whether a different system of enlisted personnel management would be more effective for the force of the 21st century, which will have higher proportions of college-bound and college-educated youth than in the past.
- Provide continuing assessment of the military compensation system and its effect on motivating, retaining, and shaping the force.
- Assess the military compensation system and its effect on motivating, retaining, and shaping the force, with special emphasis on alternatives to the current compensation structure that might accommodate alternative career lengths and more flexible military career patterns
- Continue to assess most cost-effective ways to recruit, train, and retain uniformed military personnel in active and reserve forces.
- Explore new and innovative ways to complete the seamless integration of active and reserve components, both in operations and as regards their underlying personnel management systems.
- Systematically evaluate the impact on health care access and health care quality of recent reforms in the Military Health System.
- Continue to analyze implementation issues related to new initiatives in the Military Health System, especially (1) reserve health care, (2) health care for Medicare-eligible retirees ("Tricare for Life"), and (3) health system integration (military and civilian treatment facilities).
- Monitor and assess perceptions of equal opportunity and sexual harassment issues in the Department, and develop alternate approaches to improving policies and enforcement if necessary.
- Address issues that were highlighted by the strategic review of military morale and quality of life (the "Jeremiah Panel").
- Analyze issues relating to spousal employment and access to child care as they affect military members.
- Respond to congressional mandates and directives.

General Support to Director, Program Analysis & Evaluation

FY 2000 Accomplishments

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1. Current Defense Issues

Analytical Challenges

Strategy

- Continued development of critical management indicators, tools, and techniques for incorporation into DPP materials used to provide DoD senior leadership with an overview of long-term trends, "health", and affordability of the defense program.
- Provided analytical foundation for cost-effective resource allocation among space, missile defense, and reconnaissance systems.
- Performed analysis in support of PA&E's assessment of Air Mobility Command's Oversize and Outsize Analysis of Alternatives.
- Analyzed risks associated with the restructuring of the Army's Crusader program.

Adaptive Force Structure

- Analyzed digitization's operational effectiveness, accounting for program delay and delayed resourcing; analysis will inform Program Reviews for FY 02-07 and the QDR, and provide alternative, executable courses of action for the Army as digitization evolves in the near term.

Smaller Scale Contingencies

- Analyzed U.S. involvement in smaller-scale contingencies and issues related to U.S. military involved in these operations; Assessed impact of projected level of global engagement on U.S. force structure, PERSTEMPO and OPTEMPO, and ability to fight and win MTWs.
- Built an analytic foundation for examining opportunities and challenges arising from operations with non-U.S. military organization in future smaller scale contingencies (SSCs).

Modernization

- Reviewed radar technologies to meet future shipboard air defense needs. Developed transition plan for implementing acquisition for next generation radars.

Infrastructure

- Developed "should cost" model to establish an estimate of requirements for the defense health program and to illuminate decisions on a program that commands an increasing proportion and amount of the DoD topline.
- Developed statistical methods that model relationship between customer funding (as contained in the FYDP), and the resulting purchases from working capital funds over the program period.
- Provided senior leaders with key analyses to aid in resource allocation decisions and enhance defense planners' ability to make most effective use of scarce collective defense resources.

- Developed estimates of relationships between potential force structures being considered as part of the QDR and various other kinds of infrastructure spending.

Congressional Mandates

- Estimated cost of F-22, JSF, and other military aircraft, the results of which are required for the MSII independent cost estimate for the JSF program scheduled for early FY 2001.
- Analyzed aerial refueling tanker requirements in support of air mobility operations.
- Analyzed the conduct of Operation Allied Force in order to apply lessons learned to future deployments.
- Assisted in the preparation of DoD response to the requirements of the FY 2000 National Defense Authorization Act regarding the documentation and evaluation of management headquarters activities

2. Development of Analytic Tools

Cost Analysis Research and Tools

- Developed metrics to gauge the sufficiency of military service and major defense agency funding for O&M.
- Provided research on new tools for estimating costs of new development programs in key product sectors.
- Sponsored symposium for DoD cost research activities among OSD, the military services, and defense agencies.
- Provided data related to the magnitude, sources, and characteristics of weapon systems cost /schedule growth.
- Developed databases and methods for estimating development and production costs of next generation tactical aircraft.
- Improved PA&E's ability to evaluate program assumptions in areas related to software, and the ability to evaluate costs and benefits of software development programs and strategies.

Effectiveness Analysis Tools

- Assessed Army's update to the analysis of alternatives for the Comanche helicopter program.
- Provided expert analytical critique and assistance for developing mathematical/engineering tools needed to examine selected TACAIR analyses and studies.
- Re-estimated translator vectors to improve accuracy of Defense Employment and Purchases Projection System (DEPPS) projections of DoD spending.
- Examined the effectiveness of advanced precision weapons on the effectiveness of joint attack forces.
- Provided an analytically rigorous methodology for providing direction fire adjudication data to JWARS.

Planning, Programming, and Budgeting Systems (PPBS)

- Sponsored defense analysis professional forum.

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- Sponsored symposium in support of sound integration and planning of DoD economic research activities among OSD, the military services, and defense agencies.
- Provided various initiatives to improve the analytic structure of the FYDP necessary to facilitate credible FYDP-based analyses of force and infrastructure resources and to enhance value to DoD decision makers.
- Shared analytical methodology with selected foreign governments, for their resource-constrained, multi-year defense programs.

Anticipating Future Analytic Requirements -- Preparing for the Next QDR

- Reviewed Army force and manpower issues that arise as part of the PPBS FY 02-07 Program Reviews and QDR.
- Provided an innovative view of how the DoD cost community estimates aircraft production support labor costs.
- Analyzed repair process problems that contribute to degradation of aircraft readiness.
- Analyzed unmanned aerial vehicles (UAV) platform alternatives.
- Analyzed and assessed a range of alternative defense strategies suitable for consideration before and during the FY 2001 QDR
- Analyzed USAF tempo, readiness, and training issues for use during the quadrennial defense review.
- Improved PA&E's Joint Integrated Contingency Model (JICM) capability to address QDR issues relating to regional conflicts
- Provided analytical foundation for evaluating tradeoffs between C4ISR systems and strike weapons systems.
- Assessed DoD’s major IT acquisition programs in order to identify common IT acquisition problems and recommend changes.

FY 2001 Program

1. Major Defense Issues:

- Analyzed digitization's operational effectiveness, accounting for program delay and delayed resourcing; analysis will inform Program Reviews for FY 02-07 and the QDR, and provide alternative, executable courses of action for the Army as digitization evolves in the near term.
- Develop a methodology for assessing a major issue regarding the Army in the QDR.
- Continue development of critical management indicators, tools, and techniques for incorporation into DPP materials used to provide DoD senior leadership with an overview of long-term trends, "health", and affordability of the defense program.
- Research aircraft characteristics and performance data to support studies of air superiority force structure alternatives.
- Examine survivability, lethality, and range of individual platforms identified as potential LRI aircraft in context of future threat scenarios to show how platform alternatives influence the effectiveness of the entire force.

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- Review radar technologies to meet future shipboard air defense needs. Develop transition plan for implementing acquisition for next generation radars. Analyze radar configurations of ship classes, alternatives to shipboard radars, and adequacy of the Navy's acquisition plans for next-generation shipboard air defense radars.
- Provide expert analytical critique and assistance for developing mathematical/engineering tools needed to examine selected TACAIR analyses and studies to include aircraft end-game maneuver, aircraft attrition, stealth utility, laser performance, weapons effects, and aircraft CER development.
- Assess Army's update to the Analysis of Alternatives for the Comanche helicopter addressing issues in the areas of low observability and the achievement of weight goals; review potential cost tradeoffs between component materials alternatives.
- Create guidance to the services for comprehensive Analyses of Alternatives to support the DAB acquisition Milestones; a DoD 5000 responsibility assigned to OSD/PA&E.
- Support defense analysis professional forum.
- Support symposium for DoD cost research activities among OSD, the military services, and defense agencies.
- Re-estimate translator vectors to improve accuracy of Defense Employment and Purchases Projection System (DEPPS) projections of DoD spending.
- Develop recommendations for fee-for-service funding arrangements for the Armed Forces Institute of Pathology.
- Develop updated predictive Personnel Inventory Cost and Compensation Model (PICCM) model to advance assessment of programming decisions concerning future military manpower gains, losses, demographics and costs.
- Determine opportunities to increase savings / reduce costs associated with energy use and environmental cleanup associated with BRAC closures.
- Develop a "should cost" model to establish an estimate of requirements for the defense health program and to illuminate decisions on a program that commands an increasing proportion and amount of the DoD top line.
- Analyze repair process problems that contribute to degradation of aircraft readiness.
- Develop relationships for O&M funding based on key parameters that can be used to gauge the sufficiency of military service and major defense agency funding for O&M.
- Improve cost estimating relationships for Ballistic Missile Defense systems in preparation for major milestone reviews.
- Provide necessary data to address policy issues related to the magnitude, sources, and characteristics of weapon systems cost growth and schedule growth.
- Provide an innovative view of how the DoD cost community estimates aircraft production support labor costs.

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- Develop methodologies for assessing program progress, and estimating lifecycle cost and risk of integrated and/or confederated systems of software-intensive systems
- Collect, analyze, and exploit latest available information to develop databases and methods for estimating development and production costs of next generation tactical aircraft.
- Estimate cost of F-22, JSF, and other military aircraft, the results of which are required for the MSII independent cost estimate for the JSF program scheduled for early FY 2001.
- Improve quality, timeliness, and cost effectiveness of DoD software cost estimating with development of a parsimonious set of historical resources and cost-driver data, and data collection consistent with principles of acquisition streamlining.
- Provide senior leaders with key analyses to aid in resource allocation decisions and enhance defense planners' ability to make most effective use of scarce collective defense resources.
- Analyze aerial refueling tanker requirements in support of air mobility operations.
- Analyze U.S. involvement in smaller-scale contingencies and issues related to U.S. military in these operations; Assess impact of projected level of global engagement on U.S. force structure, PERSTEMPO and OPTEMPO, and ability to fight and win MTWs.
- Build an analytic foundation for examining opportunities and challenges arising from operations with non-U.S. military organization in future smaller scale contingencies (SSCs).
- Establish measures of effectiveness and assessment methods, and identify synergies to ensure consistent management throughout DoD's Regional Centers for Security Studies.
- Share an analytical methodology with selected foreign governments that will produce a resource-constrained, multi-year defense program that supports the national security strategy and can be converted into a defense budget that can be justified to Parliament.

2. Joint Efforts (Primarily QDR)

- Analyze long-term planning scenarios through the exercise of three models, JICM, ITEM, and TACWAR. The evaluation and comparison of outputs of the three models will enable PA&E to better interpret results for use in QDR and other decision making processes and to facilitate presentation of results to interested DoD groups.
- Improve the capability to address QDR and follow-on issues relating to regional conflicts-both traditional MTWs and longer-range "Regional Great Power" threats with the Joint Integrated Contingency Model (JICM).
- Build an analytic foundation for examining smaller scale contingencies (SSCs) with emphasis on how best to balance the requirements of MTWs and SSCs within the strategy of shape, respond, and prepare.

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- Develop analytic foundation for examination of SSCs with special emphasis on incorporating international organizations (IOs) and non-governmental civilian organizations (NGOs) capabilities and concepts of operations into DoD's SSC programmatic analysis.
- Assess key features of contemporary defense logistics management framework and environment; identify associated potential major defense logistics challenges; develop 21st Century logistics support concepts that meet projected needs.

3. Development of Tools and Databases

- Provide for various initiatives to improve the analytic structure of the FYDP necessary to facilitate credible FYDP-based analyses of force and infrastructure resources and to enhance value to DoD decision makers.
- Develop statistical methods that will model the relationship between customer funding (as contained in the FYDP), and the resulting purchases from working capital funds over the program period.
- Continued development and enhancement to model which will aid in understanding the dynamics of the Managed Care Support contracts, predict health care costs and the contractor's reimbursement under the contract, support the budgeting process, and perform what-if scenarios.
- Provide research on new tools for estimating costs of new development programs in key product sectors.
- Provide new estimating relationships for future Navy ship acquisition programs.
- Support symposium on sound integration and planning of DoD economic research activities among OSD, the military services, and defense agencies.
- Provide a parametric estimate based on historical aircraft propulsion components and the limited experience from current technology to help in developing reasonable and defensible cost estimates.
- Improve the Department's suite of joint mobility and campaign models and simulations. Detailed comparison of the mobility functionality of JWARS with MIDAS, the proposed replacement model
- Provide expert up-to-date research and consultative services on information technology and information assurance.
- Improve PA&E's ability to evaluate program assumptions in areas related to software. Improve ability to evaluate costs and benefits of software development programs and strategies.

4. Longer-Term Projects

- Explore expanding state-of-the-art planning algorithms to a theater-level combat model.

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FY 2002 Plans

- Examine, analyze and evaluate the risks and implications of defense strategies that support national objectives to include an assessment of threat environment that focuses on the impacts of asymmetric threats; DoD's roles, responsibilities, and requirements for homeland defense; alternate postures of engagement; and the unique demands of smaller scale contingencies.
- Explore transformation strategies and implementation plans for new operational concepts and new organizational arrangements that exploit new technologies.
- Look to more adaptive force structures that will address the emerging threat while simultaneously addressing the long standing issues of tempo, readiness, and infrastructure.
- Examine investment strategies accounting for interrelationship between re-capitalization, transformation, force structure spending.
- Conduct analyses of the modernization program to strike a balance between modernizing platforms and modernizing weapons.
- Explore strategies that maintain nuclear deterrence and stability in the changing security environment.
- Continue to build and refine analytical tools that can better address current and emerging issues facing the department. These tools include cost analysis and research tools, effectiveness analysis tools, and the PPBS
- Develop cost analysis and research tools to address the costs of the military medical delivery system and will improve our ability to understand and project DoD infrastructure and requirements.
- Develop effectiveness analysis tools and conduct studies to provide independent estimates of the cost and operational effectiveness of planned weapon systems.
- Continue support for FYDP Improvement initiative, the Automated Program Planning System, and the PPBS automated tool kit.

General Support for ASD (C3I)

FY 2000 Accomplishments

- Supported development of an Information Superiority Investment Strategy (ISIS) which prescribes a comprehensive program of future expenditures and savings in the C4ISR and broader information arena.
- Developed an Information Superiority Advanced Technology Plan, identifying DoD future information technology needs.
- Studied the role of US and foreign commercial information technology firms involved in US defense programs and projected impact of consolidation within the commercial and defense IT markets on the US defense industry.
- Evaluated contributions of new C4ISR technology to the warfighting process and facilitated process improvements by accelerating the implementation of selected C4ISR technologies.

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- Supported the development of a proof of concept prototype for the Joint Operational Architecture that aggregates task/activity/information exchange from six functional areas into a single, common, comprehensive, easily assessable database.

FY 2001 Program

- Continue support to the Information Superiority Investment Strategy (ISIS).
- Conduct analysis and technical assessments of future satellite technology and future space systems using this technology.
- Examine the Command and Control Information Domain to propose improvements to optimize warfighting outcomes.
- Analyze all aspects of information operations/information warfare strategy and policy to promulgate effective guidance.

FY 2002 Plans

- Continue to review information operations/information warfare policies and implement improved strategies.
- Continue to evaluate warfighting requirements, plans, budgets, and investment programs for acquisition of C4ISR systems.
- Analyze defensive IW capabilities.
- Support space systems acquisition and review.

General Support for the Joint Staff

FY 2000 Accomplishments

- Conducted the Joint Strategy Review study.
- Continued to develop more efficient method to build domain specific architectures/components for DOD application/software systems, advanced modeling and simulation tools, and a repeatable process for fielding Global Command and Control System components.
- Continued preparations for the Focused Logistics Wargame 2001.
- Conducted analysis of strategic mobility and logistics in the Joint Warfare System (JWARS).
- Pursued a focused modernization effort that maintains US qualitative superiority in key warfighting capabilities, exploits the Revolution in Military Affairs, and supports the joint operational concepts delineated in Joint Vision 2010.
- Provided strategic and inter-theater guidance for coherent sustainment and resupply operations, to include the roles and functions of the Services, Defense Logistics Agency, and third party logistics.

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- Developed guidance on conventional armaments and weapon systems (and other programs) being transferred, sold, leased, loaned, acquired, modified or eliminated.
- Conducted workshops to develop technology transfer policy.
- Continued efforts to define and implement the Global Information Systems Architecture.
- Performed assessment of the Joint Tactical Radio System (JTRS) integration with the Joint Network Mgt System (JNMS).
- Continued the Joint Vision 2020 focused logistics implementation.
- Verified Joint Vision 2010 desired operational capabilities and possible effectiveness measures from selected logistic functional perspectives.
- Assessed joint logistics capabilities in support of a global engagement posture.
- Conducted the Focused Logistics Wargame (FLOW) 2001.

FY 2001 Program

- Identify factors (exclusive of compensation) that most adversely impact the recruiting environment.
- Determine feasibility of a two-year national compulsory service.
- Create tool/methodology to determine information and resource requirements forming basis of programming for future manpower & imagery exploitation workstation.
- Conduct battle damage assessment study focusing on characterizing battle damage assessment observables associated with full range of existing IO weapon system attacks; develop IO BDA planning & collection guide; determine how design, tasking, and operational procedures can be best modified to support IO operations.
- Develop a DYNAMIC COMMITMENT database.
- Support development of DJCS policy from review of START II and negotiations on START III & ABM Treaties.

FY 2002 Plans

- Conduct “quick-turnaround” assessments directed by Chairman of the Joint Chiefs of Staff.
- Continue to provide responsive wargaming, analysis and assessment capabilities to support future JS requirements.
- Assess Joint Warfighting Capabilities.
- Continue collaborative analysis to exploit existing analytic expertise in the Services and help assess complex joint issues.
- Enhance the portfolio optimization model to capture research and development costs and investigate second tier contractor effects.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE **June 2001**
APPROPRIATION/BUDGET ACTIVITY **Research, Development, Test & Evaluation, Defense-wide**	R-1 ITEM NOMENCLATURE **Technical Studies, Support & Analysis PE 0605104D8Z**

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget	27.421	30.597	33.613	Continuing
Appropriated Value	0	30.597		
Adjust to Appropriated Value/President's Budget	30.021			
Congressional Undistributed Reductions, Inflation Savings, Gov't-Wide Rescission, and Below Threshold Reprogramming	(2.119)	(.282)	.192	
Current President's Budget	27.902	30.315	33.805	Continuing

Funding:

Schedule: N/A Technical: N/A

C. Other Program Funding Summary Cost N/ A

D. Schedule Profile N / A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/BUDGET ACTIVITY 6	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **SUPPORT TO C3I** **PE 0605116D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.611	58.227	21.061						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description of Element: Funding is provided for technical and analytical support to evaluate and improve the management oversight of DoD space and information superiority programs. Support is focused on reviewing the resources and acquisition issues for existing and planning National Security Space Programs and analysis of evolving technologies to better prepare DoD to meet future challenges of the Information Age. Analytical studies will also evaluate information operations, counterintelligence capabilities, and C2 issues.

Program Accomplishments and Plans:

FY 2000 Accomplishments: ($7.611 million)

- Support development of the Joint Central Analytic Group (JCAG) to assess threats to DoD's critical technologies and provide the basis to ensure the horizontal protection of critical program information across Defense, Service and Agency boundaries.
- Support management, coordination, and review of DoD space policy.
- Support the Pacific Disaster Center test bed development of policy, management, technology, and operations for environment security.
- Define DoD issues with Windows 2000 operating system products, conduct enterprise technology assessments, and implement planning and knowledge transfer on Microsoft technology.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/BUDGET ACTIVITY 6	R-1 ITEM NOMENCLATURE Program Element (PE) PE 0605116D8Z **SUPPORT TO C3I**

FY 2001 Plans: **($58.227 million)**

- Continue analytical support of DoD space policy issues and information superiority programs.
- Support continued development of DoD policy on information operations and counterintelligence issues.
- Support the Pacific Disaster Center
- Provide Support to JCOATS-IO
- Support to Global Infrastructure Data Capture Initiative
- Support for the Information Technology Center

FY 2002 Plans: ($20.942 million)

- Continue analytical support of DoD space policy issues and information superiority programs.
- Support continued development of DoD policy on information operations and counterintelligence issues.
- Integrate space system architectures, eliminate unnecessary vertical stove-piping of space programs, and achieve efficiencies in acquisition and future operations through space program integration.
- Modify, update, and maintain C4ISR Resource System and Information Technology Management application.
- Support development of CINC architectures to define command capabilities and perform cross-CINC analysis of capabilities to impact IT investment decisions.

B. Program Change Summary	FY2000	FY2001	FY 2002	Total Cost
Previous Presidents Budget Submit	2.000	2.000	3.794	Continuing
Appropriated Value	8.000			
Congressional Adjustment		55.000		
Adjustments for inflation, the	(.389)	1.638	17.267	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/BUDGET ACTIVITY 6	R-1 ITEM NOMENCLATURE Program Element (PE) PE 0605116D8Z **SUPPORT TO C3I**

Government-wide rescission, and program revisions		(.411)		
President's Budget Submission	7.611	58.227	21.061	Continuing

Change Summary Explanation:

FY 2000 Defense Appropriations Act provided a $6M Congressional Add to support the Pacific Disaster Center (PDC) partially offset by inflation savings and government-wide rescissions. FY 2001 reflects program revisions and inflation savings. Also reflects congressional adds for Pacific Disaster Center, JCOATS-IO, and the Global Infrastructure Data Capture Initiative. Reflects a .7% undistributed reduction. Funds to support the National Security Space Architecture (NSSA) program were transferred to this program element beginning in FY2002. FY2002 increase also reflects the realignment of O&M funding to RDT&E to conform with revised IT budgeting policy.

C. Other Program Funding Summary Cost: N/A

D. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	Date June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/Budget Activity 6	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **FOREIGN MATERIAL ACQUISITION & EXPLOITATION** **PE 0605117D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Total Cost
Total Program Element (PE) Cost	63.751	71.632	31.951						Continuing
Project Name/No. and Subtotal Cost FMA&E/P411	63.751	71.632	31.951						Continuing

A. Mission Description and Budget Item Justification

Brief Description of Element: This program is involved in the acquisition and exploitation of foreign military equipment and military technology.

Program Accomplishments and Plans: The DoD Foreign Material Program acquires and exploits foreign materiel systems, subsystems, components, commercial items with military applications, and technologies as well as related technical and operational documents. The FY 2000 and out year program is a classified activity about which information is available to properly cleared and authorized personnel.

Provide an acquisition strategy: The Foreign Material Program Review Board (FMPRB) approves annual Foreign Material Acquisition (FMA) lists that target high-priority foreign military materiel that is potentially acquirable. As targets of opportunity become available, materiel acquisition actions are handled with real-time responsiveness and obligation of funds.

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	63.751	71.667	31.770	Continuing
Appropriated Value				
Adjustments to Appropriated Value		(.35)		
a. Congressionally directed undistributed reduction				
b. DoD Budget Adjustment			(.181)	
Current President's Budget	63.751	71.632	31.951	Continuing

Change Summary Explanation: NA
Funding: NA
Schedule: NA
Technical: NA

C. Other Program Funding Summary Cost: N/A

D. Schedule Profile: N/A

Exhibit R-2, RDT&E Budget Item Justification									Date: June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6				R-1 ITEM NOMENCLATURE Export License Control – PE: 0605123D8Z						
COST *($ In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.500	5.945	10.559						N/A	Cont.

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(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT: The program element supports the research, design and acquisition of an automated system by the Director, Policy Automation Directorate (PAD), Office of the Under Secretary of Defense for Policy (OUSD(P)), for export license processing and analysis. The system will be integrated among all export license regulatory and reviewing agencies (Departments of Defense, Commerce, State, and other agencies) and incorporate connectivity to industry license applicants. The system will improve the quality of the reviews that protect critical military capabilities and support defense cooperation with allies and friends, and reduce review times to meet global marketplace demands. This program is a new start effort.

(U) FY 2001 Plans:

- Initiate definition of requirements and security analysis.
- Complete System Development Plan.
- Complete Functional Requirements Document.
- Begin prototype development.
- Develop System Test Procedures.
- Develop System Implementation Plan.

(U) FY 2002 Plans:

- Field prototypes
- Validate System Requirements
- Validate System Design
- Procure and field production hardware (Phase 1)
- Field communications infrastructure improvements

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLATURE Export License Control – PE: 0605123D8Z

(U) B. Program Change Summary

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	1.500	6.000	10.500	Continuing
Congressional Directed Undist Reduction		-.055	.059	
President's Budget Submission	1.500	5.945	10.559	Continuing

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. Other Program Funding Summary: Procurement funds: FY2002 ($2.5 million).

(U) D. Acquisition Strategy: Contract award 29 Dec 2000 to SRA International via NIH CIO-SP contract # 263-96-D-0327, delivery order # DASW01-01F-0390 for program management and system integration services.

(U) E. Schedule Profile: Program milestone chart follows.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLATURE Export License Control – PE: 0605123D8Z

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLATURE Export License Control – PE: 0605123D8Z

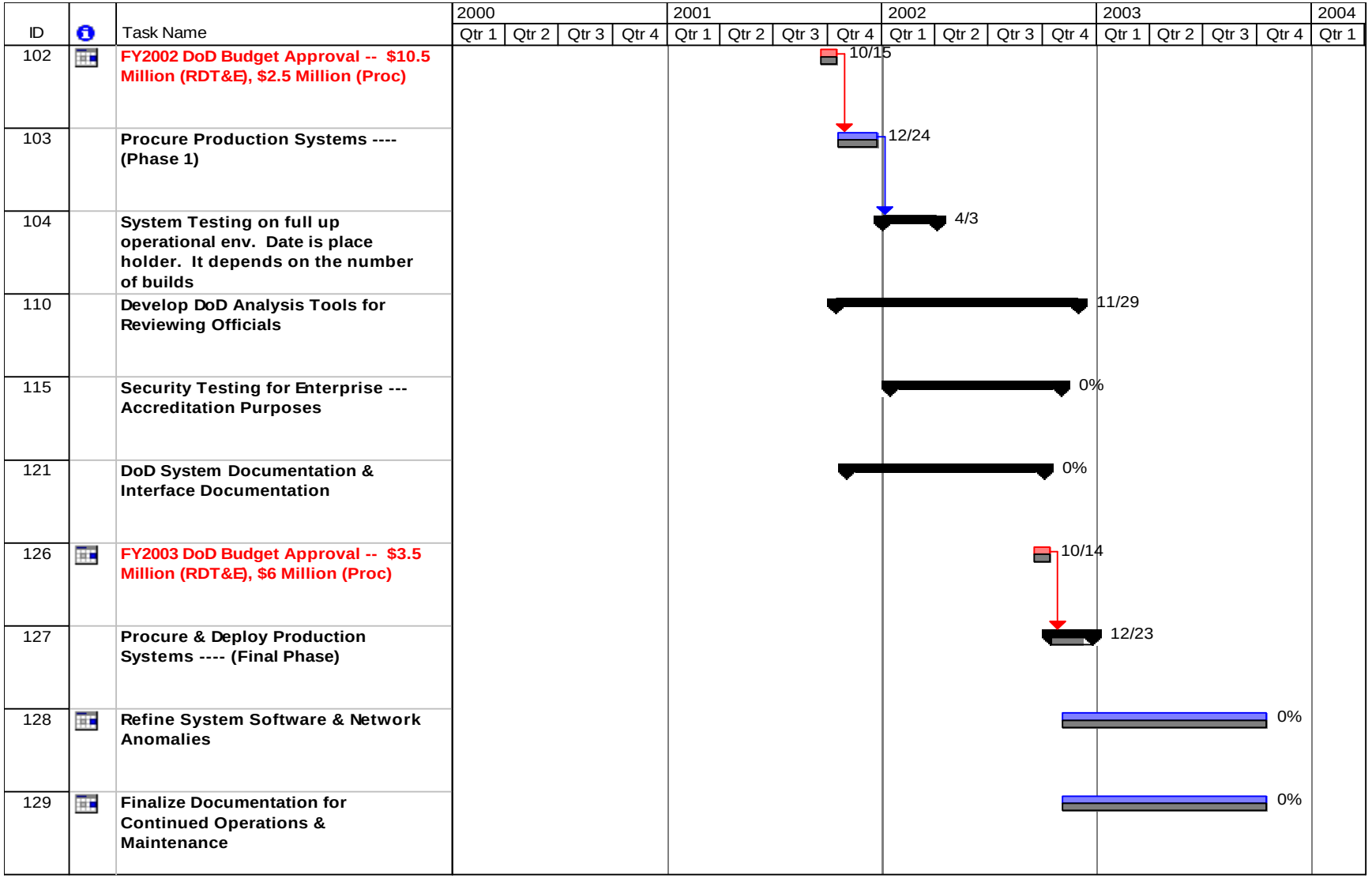

Exhibit R-2, RDT&E Budget Item Justification						Date: June 2001			
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6				R-1 ITEM NOMENCLTURE Defense Travel System – PE: 0605124D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total Cost
Total Program Element (PE) Cost	0	9.038	29,955						
Defense Travel System	0	9.038	29,955						

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

(U) BRIEF DESCRIPTION OF ELEMENT: The PMO for the Defense Travel System was established to provide procurement management and system fielding support worldwide. The DTS is the standard DoD business travel services system that combines reengineered travel policies and procedures with the best industry practices and technology. The DTS provides full travel management support from arranging for travel and approving travel authorizations, to processing reimbursement vouchers following travel and maintaining appropriate government records. The Defense Travel System is a fully electronic process that leverages technology to speed the coordination of travel, incorporates a digital signature capability, and embraces standard industry Electronic Commerce procedures. Funding for the R&D elements of this program has been realigned from the O&M appropriation, in accordance with OSD memo dated Oct 26, 1999, Subject: Budgeting for Information technology and Automated Information Systems.

PROGRAM ACCOMPLISHMENTS AND PLANS: ($ in Thousands)

1. (U) FY 2001 ACCOMPLISHMENTS:

   - Testing of the mappings between the Defense Travel System's Common User Interface (CUI) and one of the Army Defense Accounting & Disbursing Systems (DADS). There are currently 35+ different accounting and disbursing systems that DTS must interface with.
   - Continued development of electronic maps between the CUI and the DADS.
   - Continued development of the MIS/Archive for electronic storage of travel records

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLTURE Defense Travel System – PE: 0605124D8Z

PROGRAM ACCOMPLISHMENTS AND PLANS: (Continued)

- Initial upload of personnel profiles from DMDC files during testing.
- Successfully completed DTS program assessment and DoD infrastructure assessment

2. (U) FY 2002 PLANS:

- Continue development and testing of DADS interfaces with CUI
- Deploy DTS to 10 initial pilot sites for assessment.
- Start development and test of P3I items. Some of the major items are Web migration, Charge Card Vendor Interface, Global Transportation Network Interface, and the Defense Information Infrastructure Compliance.

(U) B. PROGRAM CHANGE SUMMARY:

	FY 2000	FY2001	FY 2002	Cost to Complete
(U) Previous President's Budget Submit:	0	9.122	4.854	Continuing
(U) Adjustments from FY2001 PRESBUDG:	0	-.084	+25.101	Continuing
(U) President's Budget Submit:	0	+9.038	+29.955	Continuing

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The increase is the result of a complete program assessment and restructure that identified increased development and testing requirements for the program.

(U) Schedule: Program schedule is currently being updated to reflect the restructured program.

(U) Technical: None.

Exhibit R-2, RDT&E Budget Item Justification	Date: June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E – Defense Wide/Budget Activity: 6	R-1 ITEM NOMENCLTURE Defense Travel System – PE: 0605124D8Z

(U) C. OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

Project Number & Title	FY2000 Actual	FY2001 Estimate	FY2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	To Complete	Total Cost
(U) O&M Line Defense Travel System	19,981	33,731	56,874							

(U) D. ACQUISITION STRATEGY: Not Applicable

(U) E. SCHEDULE PROFILE: Not Applicable

BUDGET JUSTIFICATION
FOR PROGRAM ELEMENTS OF THE
OSD RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE-WIDE PROGRAM
FY 2002 AMENDED BUDGET SUBMISSION

PE 0605128D8Z, Classified Program USD(POLICY), is justified in the classified annex.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)							June 2001		
DEFENSEWIDE RDT&E (0400) BUDGET ACTIVITY SIX			FOREIGN COMPARATIVE TEST (FCT) PE 0605130D8Z						
$'s in Thousands	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	TOTAL COST
PE 0605130D	0	31,405	30,907	Cont'g	Cont'g	Cont'g	Cont'g	Cont'g	Cont'g

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

The mission of the FCT program is to test and evaluate foreign non-developmental items (NDI) identified by the CINCs and Services in order to avoid costly and time-consuming U.S. new start acquisition programs. The FCT program is Congressionally mandated in Title 10, USC, Section 2350a. FCT tests and evaluates conventional defense equipment, munitions, and technologies manufactured and developed by major allies of the United States and other friendly foreign countries to determine the ability of such equipment, munitions, and technologies to satisfy United States military requirements or to correct operational deficiencies. While the testing of NDI and items in the late state of the development process are preferred, the testing of equipment, munitions, and technologies may be conducted to determine procurement alternatives. FCT projects are nominated by the Services and U.S. Special Operations Command (SOCOM) each year and submitted to Congress for approval prior to expenditure of funds.

This Research Category 6.5 is assigned and identified in this descriptive summary in accordance with existing DoD policy.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 2000 Accomplishments:
- Completed 21mm Trainer for M72 LAW.
- Completed 30mm APFSDS Tracer Round.
- Completed 40mm Practice Grenade.

- Completed Afocal Assembly.
- Completed Electronic Module.
- Completed Emergency Aircraft Arresting System.
- Completed High Pressure Pure Air Generator.
- Completed Improved Battery Cells.
- Completed Laser/Primer Compatible Igniter.
- Completed Lightweight Hand Grenade.
- Completed Lightweight Roadwheels for AAAV.
- Completed Molecular Sieve Oxygen Generating System.
- Completed Scanner Assembly, NV80 B-Kit.
- Completed Submarine Escape & Immersion Equipment.
- Continued Advanced Lightweight Grenade Launcher Ammunition.
- Continued Combat Vehicle Crew Fire Extinguisher.
- Continued F-15 Countermeasures Dispenser.
- Continued Gunfire Detection System.
- Continued Infrared Flare for C-17.
- Continued Joint JRAAWS Ammunition Upgrades, Phase II.
- Continued Lightweight Aluminum Track for AAAV.
- Continued Micro-Satellite for Space Experiments.
- Continued Parachute Leaflet Delivery System.
- Continued Patrol Coastal Decoy System.
- Continued Plastic Practice Bombs.
- Continued MC-130H Air Refueling System Pod.
- Continued Stealth Screen System.
- Continued Supersonic Target Missile.
- Initiated and completed 155mm Sensor Fuzed Ammunition.
- Initiated and completed 5.56mm Lightweight Machine-Gun.
- Initiated and completed Passenger Anti-Exposure Survival System.
- Initiated and completed Portable Intrusion Detection Sensor Cable.
- Initiated Anti-Jam GPS Antenna.
- Initiated Combat Vehicle Troop Seat.
- Initiated High Performance Hydraulic Pump for AAAV.
- Initiated Joint Protective Aircrew Ensemble.
- Initiated Large Aircraft Decontamination System.

- Initiated Less Sensitive RDX.
- Initiated Lightweight Chemical Agent Detector.
- Initiated Lightweight Diesel Driven Auxiliary Power Unit for AAAV.
- Initiated Mine Protected Clearance Vehicle.
- Initiated Retractable Arresting Cable System.
- Initiated Star Tracker.
- Initiated Space Qualified Digital Signal Processor.
- Initiated Supersonic Target Missile.
- Initiated Wide-band Klystron for E-3 AWACS.
- Initiated Wind Tunnel-Internal Force Balance.

FY 2001 Plans:

Fund the following new or continuing foreign system tests and evaluations and/or technology assessments to include:

- Complete Anti-jam GPS Antenna.
- Complete Combat Vehicle Crew Fire Extinguisher.
- Complete Combat Vehicle Troop Seat.
- Complete F-15 Countermeasures Dispenser.
- Complete High Performance Hydraulic Pump for AAAV.
- Complete Joint JRAAWS Ammunition Upgrades, Phase II.
- Complete Mine Protected Clearance Vehicle.
- Complete Patrol Coastal Decoy System.
- Complete Space Qualified Digital Signal Processor.
- Complete Stealth Screen System.
- Complete Wind Tunnel Internal Force Balance.
- Continue Advanced Lightweight Grenade Launcher Ammunition.
- Continue Gunfire Detection System.
- Continue Infrared Flare for C-17.
- Continue Joint Protective Aircrew Ensemble.
- Continue Large Aircraft Decontamination System.
- Continue Less Sensitive RDX.
- Continue Lightweight Aluminum Track for AAAV.
- Continue Lightweight Chemical Agent Detector.
- Continue Lightweight Diesel Driven Auxiliary Power Unit for AAAV.
- Continue MC-130H Aerial Refueling System Pod.

- Continue Micro-Satellite for Space Experiments.
- Continue Plastic Practice Bombs.
- Continue Parachute Leaflet Delivery System.
- Continue Retractable Arresting Cable System.
- Continue Star Tracker.
- Continue Supersonic Target Missile.
- Continue Wide-band Klystron for E-3 AWACS.
- Initiate and complete Antenna Mast for Mobile Tactical Communications.
- Initiate and complete Expeditionary Airfield Light-Duty May System.
- Initiate and complete IR/UV Threat Stimulator.
- Initiate and complete Muzzle Brake/Supressors.
- Initiate and complete Personal Temperature Regulating Clothing.
- Initiate and complete Submarine Torpedo Room Berthing Pod.
- Initiate and complete Tactical Long-range Passive IR Sensor.
- Initiate and complete Unattended Ground Imager.
- Initiate Advanced Demolition Weapons.
- Initiate Airborne Video Recorder/Replay System.
- Initiate Bradley Fighting Vehicle Roadwheels.
- Initiate Chemical Protective Gloves.
- Initiate Driver's Vision Enhancer.
- Initiate Floating Smoke Pot Components.
- Initiate High Mobility Excavator.
- Initiate MAAWS Illumination Round.
- Initiate Man Portable Multi-Sensor System.
- Initiate Multi-Bandwidth Submarine Antenna.
- Initiate Optically Improved SADA II.
- Initiate Prophet Ground.
- Initiate Skin/Open Wound Decontamination.
- Initiate Tactical Geographical Information System.
- Initiate VLF/LF Composite Bushing Replacement Project.

FY 2002 Plans:

Fund approximately 43 new or continuing foreign system tests and evaluations and/or technology assessments to include:

- Complete Advanced Lightweight Grenade Launcher Ammunition.
- Complete Airborne Video Recorder/Replay System.
- Complete Bradley Fighting Vehicle Roadwheels.
- Complete Chemical Protective Gloves.
- Complete Driver's Vision Enhancer.
- Complete Floating Smoke Pot Components.
- Complete Gunfire Detection System
- Complete High Mobility Excavator.
- Complete Joint Protective Aircrew Ensemble.
- Complete Infrared Flare for C-17.
- Complete Large Aircraft Decontamination System.
- Complete Less Sensitive RDX.
- Complete Lightweight Aluminum Track for AAAV.
- Complete Lightweight Chemical Agent Detector.
- Complete Lightweight Diesel Driven Auxiliary Power Unit for AAAV.
- Complete MAAWS Illumination Round.
- Complete Man Portable Multi-Sensor System.
- Complete MC130H Aerial Refueling System Pod.
- Complete Micro-Satellite for Space Experiments.
- Complete Multi-Bandwidth Submarine Antenna.
- Complete Optically Improved SADA II.
- Complete Parachute Leaflet Delivery System.
- Complete Plastic Practice Bombs.
- Complete Prophet Ground.
- Complete Retractable Arresting Cable System.
- Complete Skin/Open Wound Decontamination.
- Complete Star Tracker.
- Complete Tactical Geographical Information System.
- Complete VLF/LF Composite Bushing Replacement Project.
- Complete Wide-band Klystron for E-3 AWACS.
- Continue Advanced Demolition Weapons.
- Continue Supersonic Target Missile.
- Initiate and complete 7.62 mm Lightweight Machine Gun.
- Initiate and complete IMU for Wind Corrected Munitions Dispenser.

- Initiate and complete Self-Regulating Anti-G Ensemble.
- Initiate and complete Stand-Alone Cooling Suit.
- Initiate 40mm Dud Reducing Ammunition.
- Initiate Communications Distribution System.
- Initiate Digital Flight Control System for EA-6B.
- Initiate High Frequency Adaptive Antenna Receiver System Replacement.
- Initiate Laser Obstacle Detection System.
- Initiate NBC Multipurpose Sock.
- Initiate Self-Destruct Fuze Multiple Launch Rocket System.

B. (U) PROGRAM CHANGE SUMMARY:

	FY2000	FY 2001	FY 2002	Total Cost
Previous President' s Budget Submit	0	31,697	31,837	Cont'g
Appropriated Value				Cont'g
Adjustments to Appropriated Value (Inflation)			101	
Section 8086 Reduction of .07%		(222)		
OSD Directed Undistributed Reduction		(70)	(1,031)[1]	Cont'g
Current President's Budget Submit	0	31,405	30,907	Cont'g

[1] Reflects program realignment which moved $75K from RDT&E to O&M for AT&L management for FCT-specific travel.

C. **(U) OTHER PROGRAM FUNDING** NA

D. **(U) SCHEDULE PROFILE** NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6							R-1 ITEM NOMENCLATURE Small Business Innovation Research (SBIR) **PE 0605502D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	25.516	0.000	0.000						Continuing	Continuing
SBIR/ P512	25.516	0.000	0.000						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) US Code Title 15, originally passed in 1983, requires the DoD to establish a Small Business Innovation Research (SBIR) program, funded by allocating 2.5 percent of their extramural RDT&E budgets, for mission-oriented R&D projects at small technology companies. The program has broad bipartisan backing in Congress, based on DoD`s recent finding that `SBIR-developed technologies have resulted in significant improvements in U.S. military capabilities and major savings to the taxpayer,` as well as highly favorable reviews of the program by the GAO (1989, 1992, 1996, 1997, 1999) and the National Academy of Sciences (1999). (U) This program element funds OSD`s portion of the DoD SBIR program. It represents 2.5 percent of the extramural RDT&E funds appropriated to OSD, and it funds R&D projects recommended and executed by the Service laboratories, with overall management oversight by OSD.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** Small Business Innovation Research (SBIR) **PE 0605502D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	25.516	0.000	0.000						Continuing	Continuing
SBIR/ P512	25.516	0.000	0.000						Continuing	Continuing

(U) Project Number and Title: SBIR, P512

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) This program element funds ear ly-stage R&D projects at small technology companies, in accord with the requirements of Public Law 102-564. The FY 1999 technology focus areas are: Army Research Laboratory Sensors/ Electronic Devices (including intersensor networks); Army Research Institute Human Systems (Cognitive Readiness); Naval Sea Systems Command Modeling and Simulation (Condition Based Maintenance Technology); and Air Force Research Laboratory Electronics. The technology focus areas planned for FY 2000 are: Cognitive Readiness and Smart Sensor Web technology. ($ 25.516 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** Small Business Innovation Research (SBIR) **PE 0605502D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	25.755	0.000	0.000	Continuing
Appropriated Value	0.000	0.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.239	0.000	0.000	
c. Other	0.000	0.000	0.000	
Current President's Budget	25.516	0.000	0.000	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** Small Business Innovation Research (SBIR) **PE 0605502D8Z**

Change Summary Explanation

(U) **Funding**. Funding represents 2.5% of extramural RDT&E funds.

(U) **Schedule**: N/A

(U) **Technical**: N/A

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Budget Activity 6					R-1 ITEM NOMENCLATURE **CLASSIFIED PROGRAMS C3I** **PE 0605710D8Z**					
COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	.574	.636	56.653						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description and Budget Item Justification: Funding provides for accomplishment of studies, assessments and technical evaluations of C3I programs. Resources support efforts including the integration of C3 and Intelligence programs and activities, the identification and resolution of national and tactical interoperability issues and fostering Defense-wide and joint support to military forces. Funding also supports various information warfare efforts including computer network defense, information assurance/information technology, the Human Factors Analysis Center, and E-Space and Network Analysis Center efforts.

Program Accomplishments and Plans:

FY 2000 Accomplishments:

- Mission Support (0.594 million)

FY 2001 Plans:

- Mission Support (0.636 million)

FY 2002 Plans:

- Mission Support (56.653 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Budget Activity 6	R-1 ITEM NOMENCLATURE **CLASSIFIED PROGRAMS C3I** **PE 0605710D8Z**

Classified Programs C3I is in Budget Activity 6, Management Support because it is consistent with established DoD definitions for BA 6.
Provide an acquisition strategy. N/A

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	.627	.641	.653	Continuing
Appropriated Value				
Adjustments to Appropriated Value				
a. Internal Reprogramming.				
b. Undistributed reductions, below threshold reprogramming, inflation savings, and government-wide rescission	(.053)	(.006)	56.000	
Current President's Budget Submission	.574	.636	56.653	Continuing

Change Summary Explanation:

FY2000: Reduction (.029)
FY2001: Program Adjustment (.005), Congressional Rescission (.001); SBIR (.016)
FY2002: Program adjustment (56.000)

C. Other Program Funding Summary Cost: N/A

D. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6							R-1 ITEM NOMENCLATURE SBIR Administration **PE 0605790D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.662	1.713	2.068						Continuing	Continuing
SBIR Administration/P518	1.662	1.713	2.068						Continuing	Continuing

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) Under the Small Business Innovation Research (SBIR) program, DoD and ten other federal agencies are required to allocate a small percentage of their extramural R&D budgets to fund mission-oriented R&D projects at small technology companies. The program has broad bipartisan backing in Congress, based on DoD`s 1996 finding that `SBIR-developed technologies have resulted in significant improvements in U.S. military capabilities and major savings to the taxpayer,` as well as favorable independent evaluations by the GAO, National Academy of Sciences, National Bureau of Economic Research at Harvard, and others. Funding for DoD`s SBIR program is approximately $500. million in FY 1998.

(U) PE 0605790D8Z is the only source of funds for the coordinated administration of the component SBIR programs within DoD, because the 1992 SBIR Act provided that `a Federal agency shall not use any of its SBIR budget...for the purpose of funding administrative costs of the program.` PE 0605790D8Z funds central elements of SBIR program administration that are required by law, including: Coordination, publication, and distribution of DoD`s SBIR research solicitations , as required by 15 U.S.C. 638(g)(2); Monitoring of DoD-wide SBIR program expenditures, to meet Congressionally-mandated reporting requirements in 15 U.S.C. 638(g)(8), (j)(2)(F), and (l)(2); Sponsorship of national SBIR conferences, which are the only existing forum for small technology companies to interact directly with DoD`s SBIR program managers, contracting officers, and technical personnel, and thereby learn how to prepare research proposals that serve DoD`s needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** SBIR Administration **PE 0605790D8Z**

(U) These functions are central to the operation of the SBIR program and have been a standard part of the program since it was initiated at DoD in 1983.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** SBIR Administration **PE 0605790D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	1.662	1.713	2.068						Continuing	Continuing
SBIR Administration/P518	1.662	1.713	2.068						Continuing	Continuing

(U) Project Number and Title: P518 SBIR Administration

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) This PE will continue to fund the core administrative functions and USD(A&T) initiatives to streamline the SBIR process, monitor the track record of multiple-award winners, and evaluate the success of the Fast Track policy and other aspects of the program. It will also fund a pilot initiative to evaluate the commercialization plans now required in all phase II SBIR proposals (commercialization in military and private sector markets). ($ 1.662 million)

(U) FY 2001 Plans:

(U) This PE will continue to fund the core administrative functions and USD(A&T) initiatives to streamline the SBIR process, monitor the track record of multiple-award winners, and evaluate the success of the Fast Track policy and other aspects of the program. It will also fund a pilot initiative to evaluate the commercialization plans now required in all phase II SBIR proposals (commercialization in military and private sector markets). ($ 1.713 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** SBIR Administration **PE 0605790D8Z**

(U) FY 2002 Plans:

(U) This PE will continue to fund the core administrative functions and USD(AT&L) initiatives to streamline the SBIR process, monitor the track record of multiple-award winners, and evaluate the success of the Fast Track policy and other aspects of the program. It will also fund a pilot initiative to evaluate the commercialization plans now required in all phase II SBIR proposals (commercialization in military and private sector markets). ($ 2.068 million)

(U) B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	1.630	1.728	1.757	Continuing
Appropriated Value	0.000	1.728	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.012	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.032	0.003	0.000	
c. Other	0.000	0.000	0.311	
Current President's Budget	1.662	1.713	2.068	Continuing

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 6	**R-1 ITEM NOMENCLATURE** SBIR Administration **PE 0605790D8Z**

Change Summary Explanation

(U) Funding: The changes in funding in FY 2000 were the result of a below threshold reprogramming. FY 2001 reductions reflected Section 8086 reductions

(U) Schedule: N/A

(U) Technical:

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

Exhibit R-2, RDT&E Budget Item Justification									June 2001	
DEFENSE-WIDE, RDT&E (0400) BUDGET ACTIVITY SIX					DEVELOPMENTAL TEST & EVALUATION PE 0605804D8Z					
COST ($ in Millions)	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
	46.255*	43.510	46.382						Cont'g	Cont'g

* - FY2000 appropriation was under Director, Test & Evaluation, Defense appropriation (0450) for FY2000 and prior years. Beginning with FY2001, appropriation was transferred to Defense-Wide RDT&E (0400).

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) BRIEF DESCRIPTION OF ELEMENT:

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, improved performance of systems, validate testing methodologies, and provide 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.

This Research Category 6.5 PE supports technical analysis and evaluation by DT&E of the Department's weapons systems to determine the adequacy of system test program structure and development plans, substantiation of technical performance requirements achievement, identification of weapon system cost performance trade-offs/design risks, system certification of OT&E, and ensures DT&E Programs are sound, well-executed and sufficiently address system's ability to meet Warfighter's needs.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2001 Accomplishments: The following activities were funded in the DTE, D (0450) appropriation for FY 2001 and were executed by USD(AT&L)/S&TS.

JT&E Programs:

- Completed Joint Suppression of Enemy Air Defense (JSEAD), conducted outbriefings, distributed the final report, and transitioned legacy products.
- Continued Joint WarFighter (JWF), Joint Close Air Support (JCAS), Joint Theater Distribution (JTD), Joint Shipboard Helicopter Integration Process (JSHIP), Joint Global Positioning System Combat Effectiveness (JGPSCE), and Joint Cruise Missile Defense (JCMD) testing.

Exhibit R-2, RDT&E Budget Item Justification	June 2001

- Chartered the Joint C2 Intelligence, Surveillance and Reconnaissance (JC2ISR) and Joint Battle Damage Assessment (JBDA) test projects and commenced testing activities.
- Determined through SAC prioritization the FY 2001 Feasibility Studies: Joint Anti-Terrorism/Force Protection (JAT/FP), Joint Aircraft Survivability to MANPADS (JASMAN), Joint UAV for Time Sensitive Operations (JUAV-TSO), and Joint C4ISR Outcome-based Integrated Architecture Assessment (JCOBIAA) were necessary and feasible for chartering as JT&Es. Final determination and charters pending results of the Senior Advisory Council review, August 2001.
- Conducted the FY 2001 JT&E annual nomination review, and are determining if the Joint Integrated Battlespace Test Methodology, Joint Versatile Information System On-Line, Joint Cognitive Ability and Readiness Measurement, Joint Combat Airspace Command and Control, and Joint Crisis Action Decision Support proposals will be approved as Feasibility Studies for conduct in FY 2002.
- Conducted the FY 2000 SAC prioritized Feasibility Studies.

T&E Independent Activities:

- Review, coordination, and approval of 49 Test and Evaluation Master Plans (TEMPs) (Draft and Service Approved).
- Review and coordination on all significant program documentation to include: 320 Defense Acquisition Executive Summaries (DAES); 36 Acquisition Decision Memoranda (ADM); and, 1587 Other Documents Reviewed.
- Analyses of programs for compliance with DT&E policies identified in the DoD 5000 acquisition policy and monitoring of on-going developmental test program activities through participation in 660 local and 273 out-of-town developmental test program fora.
- Completed Commercial Test & Evaluation "Best Practices" Study. Used results in a "Best Practices Workshop" in FY2001.

(U) FY 2002 Plans:

JT&E Programs:

- Oversight of the on-going T&E programs.
- Complete JWF, conduct the outbriefings, distribute the final report, and transition legacy products.
- Continue JTD, JCAS, JSHIP, JGPSCE, JCMD, JBDA, and JC2ISR testing.
- Charter the SAC prioritized FY 2001 Feasibility Studies as Joint Tests and commence testing activities.
- Conduct SAC prioritized FY 2001 Feasibility Studies.
- Conduct JT&E annual review of nominations for potential feasibility studies for conduct in FY 2003.
- Determine through SAC prioritization the FY 2002 Feasibility Studies.

Exhibit R-2, RDT&E Budget Item Justification	June 2001

T&E Independent Activities: Includes funding for technical analysis and evaluation of the developmental testing of the more than 220 major weapon acquisition programs, and travel for the office of DD/S&TS/DT&E. Specifically, the DT&E organization, within S&TS, is the USD(AT&L) focal point for all activities related to developmental test and evaluation as outlined in Section 133, Title 10, United States Code. T&E Independent Activities include funding for:

- Analyses of programs for compliance with DT policies identified in the DoD 5000 acquisition policy.
- Determining the adequacy of system test program structure and development plans and substantiation of technical performance requirements achievement, identification of weapon system cost performance trade-offs/design risks, and system certification of OT&E.
- Review, coordination, and approval of Test and Evaluation Master Plans (TEMPs).
- Monitoring of on-going developmental test program activities.
- Review and coordination on all significant program documentation.
- Use the Commercial Test & Evaluation "Best Practices" Study workshop results/information to examine and determine the utility of the results and those best practices that should be adopted by the Department.
- Recommend improvement to strengthen DT&E and provide necessary information/advice to DoD Acquisition decision-makers.

B. PROGRAM CHANGE SUMMARY ($ MILLION):

	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	46.255	43.510	44.382	
Appropriated Value	46.255	43.510	44.382	Cont'g
Adjustments to Appropriated Value				
a. Congressionally Directed Appropriation Reduction				
b. Congressionally Directed Undistributed Reduction				
c. Program Adjustment			+2.000	Cont'g
Current President's Budget	46.255	43.510	46.382	Cont'g

C. OTHER PROGRAM FUNDING SUMMARY: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 7							R-1 ITEM NOMENCLATURE Commercial O&S Savings Initiative **PE 0604805D8Z**			
COST *(In Millions)*	FY2000	FY2001	FY2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	11.554	9.541	10.805						Continuing	Continuing
Commercial O&S Savings Initiative/P805	11.554	9.541*	10.805						Continuing	Continuing

*Beginning in FY 2001, this pe transfers BA 5 to BA 7.

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

The purpose of the Commercial Operations and Support Savings Initiative (COSSI) is to reduce weapon system life cycle costs, especially operating and support (O&S) costs, by inserting commercial products into military systems. COSSI is a crucial element in DoD`s strategy to reduce the operations and support (O&S) costs of fielded equipment and supports the DoD goal of reducing logistics costs by 20 percent. As legacy systems age, O&S costs increase. COSSI uses technology insertions to lower these costs. COSSI also allows DoD to capitalize on the commercial innovation cycle so equipment can be modernized faster. Adapting commercial technologies for use in military equipment typically requires non-recurring engineering, testing and qualification. If the testing is successful and the cost savings validated, the items are purchased as retrofits. All COSSI projects must have an endorsement by a military customer and be linked to an existing military system. The benefits include: improved mean time between failure, improved logistics support by reducing parts obsolescence, reduced software reprogramming time and costs, improved performance, and the promotion of open system designs making future upgrades easier and less costly. COSSI promotes the use of Other Transaction Authority rather than FAR procurement contracts so companies that do not normally do business with DOD are given the opportunity to provide cost saving ideas that would otherwise go unnoticed. OSD funding provides an incentive to structure joint projects with pervasive impact across weapon systems, and to institutionalize the use of Other Transaction Agreements.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 7	**R-1 ITEM NOMENCLATURE** Commercial O&S Savings Initiative **PE 0604805D8Z**

COST*(In Millions)*	FY 2000	FY 2001	FY 2002						Cost to Complete	Total Cost
Total Program Element (PE) Cost	11.554	9.541	10.805						Continuing	Continuing
Commercial O&S Savings Initiative/P805	11.554	9.541	10.805						Continuing	Continuing

(U) Project Number and Title: P805 Commercial O&S Savings Initiative

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2000 Accomplishments:

(U) COSSI provided funds to develop and install an Integrated Mechanical Diagnostic/Health and Usage Management System on AH-1, CH-53 and SH-60 helicopters. The system collects real time data on helicopter performance including continuous rotor track and balance, vibration monitoring of the gearbox, drivetrain, and engine, and structural usage. The project is expected to reduce operation and support costs for the AH-1, CH-53, and SH-60 by over $1 billion by eliminating rotor track and balance flights, improving the efficiency of maintenance operations, enhancing operational readiness, and extending the period between depot maintenance. COSSI funding is also being used to develop a propeller control unit for P-3 aircraft. The project will replace the current analog/mechanical system with one that is digital/electromechanical. The benefits include higher reliability, elimination of control system adjustments requiring ground operation and flight checks, a built in test capability to improve trouble shooting, and elimination of parts obsolescence. The new propeller control unit is expected to reduce P-3 propeller maintenance costs from $20/flight hour to less than $4/flight hour.($ 11.554 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 7	**R-1 ITEM NOMENCLATURE** Commercial O&S Savings Initiative **PE 0604805D8Z**

(U) FY 2001 Plans:

(U) COSSI funds are being used to support three projects: an electronic propeller control system for C-130 aircraft, an advanced symbol generator for the AN/AVS-7 night vision imaging system/heads-up-display, and a new propeller deicing system for P-3 and C-130 aircraft. The electronic propeller control system for the C-130 is a spin-off of a similar COSSI project for the P-3 started in FY 2000. The project will modify the propeller control system currently used on ATR 42 and ATR 72 regional civil aircraft for use on the C-130. An electronic propeller control and electronic valve housing will replace the mechanical valve housing and synchrophaser. The project is expected to reduce propeller maintenance costs from approximately $19/flight hour to approximately $2/flight hour. The advanced symbol generator project is a follow-on to a previous COSSI project that developed active matrix electroluminescent flat panel displays for Army aviator night vision goggles. The project will replace the current signal data converter (SDC) with a new one that is smaller, lighter, and less expensive to buy and maintain. The new SDC will be almost $10,000 less expensive to buy than the one being replaced. The propeller deicing project will develop a propeller mounted generator similar to the one designed for the Beech 1900D civil aircraft. The new design eliminates the carbon brushes currently used to transfer electrical power to the propellers. Having a generator mounted directly on the propeller will eliminate the need to clean and replace the brushes every 50 flight hours. Maintenance costs will be reduced by approximately $5 million/year. ($ 9.541 million)

(U) FY 2002 Plans:

(U) DoD will issue a project call for the FY2002 program. Lessons learned during previous COSSI solicitations will be used to further refine the program. Based on previous experience, most cost saving projects are expected to pertain to upgrading electronics and computers on legacy aircraft.($ 10.805 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 7	**R-1 ITEM NOMENCLATURE** Commercial O&S Savings Initiative **PE 0604805D8Z**

(U) B. Program Change Summary	**FY2000**	**FY2001**	**FY2002**	**Total Cost**
Previous President's Budget Submit	11.878	9.629	10.744	Continuing
Appropriated Value	0.000	9.629	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.067	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.324	-0.021	0.000	
c. Other	0.000	0.000	0.061	
President's Budget Submission	11.554	9.541	10.805	Continuing

Change Summary Explanation

(U) Funding: FY 2000 funding was reflected as a source on the FY 2000 Omnibus reprogramming. FY 2001 reductions reflect Section 8086 reductions.

(U) Schedule: N/A

(U) Technical: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 7	**R-1 ITEM NOMENCLATURE** Commercial O&S Savings Initiative **PE 0604805D8Z**

(U) C. Other Program Funding Summary Cost: N/A

(U) D. Acquisition Strategy: N/A

(U) E. Schedule Profile: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE, Budget Activity 7	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **Defense Joint Counterintelligence Program** **PE 0305146D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	0	0	5.977						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description and Budget Item Justification: In FY 2000 the Deputy Secretary of Defense established the Defense Joint Counterintelligence Program. The Joint Counterintelligence Assessment Group (JCAG) was created as part of that initiative. The JCAG is tasked with developing and implementing an analysis center to support the protection of critical technology in the government. This activity responds to Deputy Secretary of Defense guidance to develop and operate such a capability to protect DoD critical technology programs from threats posed by foreign intelligence activities, foreign information operations, terrorist, and other clandestine or covert threats. The JCAG mission includes evolving analytic processes and techniques to take advantage of leading technologies and produce horizontal critical technology profiles and risk assessments. These profiles and assessments provide the necessary information for the government to understand the extent to which critical technology may be exposed or unprotected, with information to support decisions on how to improve protection both within and across programs.

Program Accomplishments and Plans:

FY 2000 Accomplishments: N/A

FY 2001 Plans: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE April 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/Budget Activity 7	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **Defense Joint Counterintelligence Program** **PE 0305146D8Z**

FY 2002 Plans:

- Establishes JCAG IOC. Planned products include Horizontal Critical Technology Profiles, Horizontal Risk Assessments, and Tailored Information Products.
- Established JCAG Full Operational Capability (FOC). FOC will add a spiral development effort to insert new technologies, capabilities, and data sources into the JCAG Automated Information System (AIS) to provide refinement of JCAG products.
- Continue Technology/Operations Beta site activities to provide the capability to assess, integrate, and test the applicability of commercial and government technologies that support the JCAG mission, and provide to the analysts the ability to evaluate potential analytical tools and evolve analytical processes.

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit			0	Continuing
Appropriated Value				
Adjustments to Appropriated Value			1.200	
a. Internal Reprogramming.				
b. Below threshold program adjustments			4.777	
c. Inflation Adjustment				
President's Budget Submission			5.977	Continuing

Change Summary Explanation:

Funding: FY 2002: Funding transferred to this PE (FY 2002: 1.200); internal realignment of funds from PE 0305190 (FY 2002: 4.777)
Schedule: N/A
Technical: N/A

C. Other Program Funding Summary: N/A

EXHIBIT R-2a, RDT&E Project Justification							DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide/BA-7**	PROGRAM ELEMENT NAME AND NUMBER **Defense Joint Counterintelligence Program PE 035146D8Z**					PROJECT NAME AND NUMBER **Joint Counterintelligence Assessment Group**				
COST ($ in Millions)	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Joint Counterintelligence Assessment Group			5.977						Continuing	Continuing

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Joint Counterintelligence Assessment Group (JCAG) is tasked with developing and implementing an analysis center to support the protection of critical technology in the government. This activity responds to Deputy Secretary of Defense guidance to develop and operate such a capability to protect DoD critical technology programs from threats posed by foreign intelligence activities, foreign information operations, terrorist, and other clandestine or covert threats. The JCAG mission includes evolving analytic processes and techniques to take advantage of leading technologies, and produce horizontal critical technology profiles and risk assessments. These profiles and assessments provide the necessary information for the government to understand the extent to which critical technology may be exposed or unprotected, with information to support decisions on how to improve protection both within and across programs. Delays in establishing a capability to conduct horizontal analysis will directly impact/delay the government's ability to quantify the extent to which technology or information is at risk, and properly size responses or programs to mitigate this risk. By leveraging from the latest technologies, analysts will exploit massive databases with dynamic retrieval, analysis, and presentation tools for decision-makers to visualize the threats, vulnerabilities, and solution sets to the DoD critical technology protection mission.

OSD/C3I has asked for an acceleration of the program based on the current world situation and the security threat to national assets. The JCAG budget across the FYDP falls short of adequate funding for a collection and analysis activity of necessary depth for an effective program. An accelerated near-term capability will require increased funding in order to develop a revised and automated analytic approach with the depth of data necessary to produce near-term meaningful products. Further reductions in the budget will severely limit the program's ability to reach a minimum threshold of conducting analysis and developing horizontal information products useful to the decision process of protecting critical technology and US interests.

FY 2000 Accomplishments: N/A

FY 2001 Program: N/A

FY 2002 Plan:

• Establishes JCAG IOC. Planned products include Horizontal Critical Technology Profiles, Horizontal Risk Assessments, and Tailored Information Products.

• Establishes JCAG Full Operational Capability (FOC). FOC will add a spiral development effort to insert new technologies, capabilities, and data sources into the JCAG Automated Information System (AIS) to provide refinement of JCAG products.

• Continues Technology/Operations Beta site activities to provide the capability to assess, integrate, and test the applicability of commercial and government technologies that support the JCAG mission, and provide to the analysts the ability to evaluate potential analytical tools and evolve analytical processes.

EXHIBIT R-2a, RDT&E Project Justification		DATE: June 2001
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, Defense-wide/BA-7	**Defense Joint CI Program, PE 0305146D8Z**	**Joint Counterintelligence Assessment Group**

(U) PROGRAM CHANGE SUMMARY: N/A

CHANGE SUMMARY EXPLANATION: N/A

B. OTHER PROGRAM FUNDING SUMMARY: N/A

C. ACQUISITION STRATEGY: DoD Data Analysis and Engineering Services Contract, Harris Technical Services Corporation (HTSC) provides analysis support of all source data and provides system design support to the data analysis function. GSA Contracts: Gray Hawk Systems Task Order provides Systems Engineering and Technical Assistance; Sytex Task Order provides systems development and engineering support; and Oracle Task Order provides technical research, development, and test support. The JCAG program follows a Systems Development Life Cycle methodology to ensure schedule, budget, technology insertion and risk mitigation goals are met. Utilize existing GSA and DoD contract vehicles.

D. SCHEDULE PROFILE:

	FY00				FY01				FY02			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Technical and Operations Beta sites operational			X	X								
I2OC established							X					
IOC established								X	X			
FOC continued spiral development and sustainment												

Exhibit R-3 Cost Analysis (page 1)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, Defense-wide / BA-7**		PROGRAM ELEMENT **PE 0305146D8Z**			PROJECT NAME AND NUMBER **Defense Joint Counterintelligence Program**							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Data Analysis and Engineering Services	CPFF Comp	Harris Technical Services Corporation	2.218								2.218	
Systems Engineering & Technical Assistance	Task Order T&M	Gray Hawk Systems	0.000	2.837	02/01						2.837	
JCAG AIS Evaluation/Pilots WBS 6.2	Task Order T&M	Oracle Corporation	0.000	0.605	02/01						0.605	
Beta Sites Development and Data Analysis Support WBS	Task Order T&M	Sytex Incorporated	0.000	0.522	02/01						0.522	
											0.000	
											0.000	
											0.000	
Subtotal Product Development			2.218	3.964		0.000		0.000		0.000	6.182	
Remarks: Task Orders are on GSA Contract Vehicles.												
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

Exhibit R-3, Project Cost Analysis

Exhibit R-3 Cost Analysis (page 2)								DATE: June 2001				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N**		PROGRAM ELEMENT				PROJECT NAME AND NUMBER						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost				3.964		0.000		0.000		0.000	6.182	
Remarks:												

Exhibit R-3, Project Cost Analysis

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE, Budget Activity 7	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **C3I INTELLIGENCE PROGRAMS** **PE 0305190D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	15.380	24.938	10.552						Continuing	Continuing
Project Name/No. and Subtotal Cost C3I Intelligence Programs/P481	15.380	24.938	10.552						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description and Budget Item Justification: PE includes all resources and manpower in support of projects managed by the Intelligence Systems Support Office (ISSO) as directed by the ASD(C3I). ISSO oversight and technical support to DoD activities and initiatives requiring assistance in technology areas ranging from concept development through demonstration of full operational capability. The primary focus is on development, integration and assessment of systems or applications in support of non-traditional and contingency warfare.

Program Accomplishments and Plans:

FY 2000 Accomplishments:

- Mission Support ($15.380 million)

FY 2001 Plans:

- Mission Support ($24.950 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/Budget Activity 7	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **C3I INTELLIGENCE PROGRAMS PE 0305190D8Z**

FY 2002 Plans:

- Mission Support ($10.552 million)

B. Program Change Summary	FY2000	FY2001	FY2002	Total Cost
Previous President's Budget Submit	15.380	25.006	15.242	Continuing
Appropriated Value				
Adjustments to Appropriated Value		(.068)		
a. Internal Reprogramming.			(4.690)	
b. Below threshold program adjustments				
c. Inflation Adjustment				
Current President's Budget Submission	15.380	24.938	10.552	Continuing

Change Summary Explanation:

Funding: FY 2001: Program adjustment ($.056 million).
Funding: FY2002: Program adjustment($4.690 million)
Schedule: N/A
Technical: N/A

R2a Exhibit RDT&E Budget Item Justification								DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY 07					Program Element (PE) Name and No. **PE 0305190D8Z C3I Intelligence Programs (ISSO)**				
COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Total Cost
Project Cost	15.380	24.938	10.552						Continuing
RDT&E Articles QTY									

A. Mission Description and Budget Item Justification:

ISSO includes all resources and manpower in support of projects managed by the Intelligence Systems Support Office (ISSO) as directed by the ASD(C3I). ISSO provides a full spectrum of Program Oversight and support to DoD activities and initiatives requiring assistance in technology areas ranging from concept development through demonstration of full operational capability. The primary focus is on development, integration and assessment of systems or applications in support of non-traditional and contingency warfare.

B. Program Accomplishments and Plans:

FY 2000 Accomplishments:

- Continued Mission Support (15.380 million)

FY 2001 Plans:

- Mission Support (24.938 million)

FY 2002 Plans:

- Mission Support (15.242 million)

C. Acquisition Strategy: N/A

D. Schedule Profile: N/A

E. Customers and Products:

Customers include OSD, JCS, the Services and their subordinate commands, the Unified Commands and their components, joint task forces, intelligence agencies, federal executive departments, other federal and state government agencies and US allies.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 7	R-1 ITEM NOMENCLATURE/PE NUMBER/PROJECT NUMBER **C3I INTELLIGENCE PROGRAMS/PE 0305190D8Z/P481**

A. Project Cost Breakdown ($ in Millions)

Project Categories	PY	CY	BY1
a. Salaries/Benefits	1.973	2.375	2.224
b. Primary Hardware Development	.037	.050	.050
c. Ancillary Hardware Development		.020	.020
d. Development Support Equipment Acquisition	1.863	4.468	3.741
e. Research Support Equipment Acquisition	.363	3.000	.090
f. Software Development		.330	.310
g. Licenses			
h. Systems Engineering	.025	.861	.895
i. Training Development	.030	.100	.030
j. Integrated Logistics Support	.168	.359	.312
k. Quality Assurance	.200	.050	.050
l. Reliability, Maintainability & Availability			
m. Configuration Management	.412	.319	.325
n. Technical Data			
o. Development Test & Evaluation	1.607	.800	.800
p. Operational Test & Evaluation			
q. Contractor Engineering Support	6.901	7.913	.510
r. Government Engineering Support	.865	.455	.505
s. Program Management Support	.740	3.309	.460
u. Travel	.196	.489	.230
v. Research Personnel			
w. Miscellaneous (less than 15%)		.040	
Total	**15.380**	**24.938**	**10.552**

R-1 ITEM NO.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 7	R-1 ITEM NOMENCLATURE/PE NUMBER/PROJECT NUMBER **C3I INTELLIGENCE PROGRAMS/PE 0305190D8Z/P481**

B. Budget Acquisition History and Planning Information Not Applicable

Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to PY	Budget PY	Budget CY	Budget BY1	Budget PY2	Budget to Complete	Total Program
Product Development Organization											
Support and Management Organizations											
Test and Evaluation Organizations											
Government Furnished Property											

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to PY	Budget PY	Budget CY	Budget BY1	Budget PY2	Budget to Complete	Total Program
Product Development Property											

R-1 ITEM NO.

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 7	R-1 ITEM NOMENCLATURE/PE NUMBER/PROJECT NUMBER **C3I INTELLIGENCE PROGRAMS/PE 0305190D8Z/P481**

C. Funding Profile Fiscal Year actual and planned obligations and expenditures
($ in Millions)

Funds Profile	PY Obs	CY Obs	BY1 Obs	PY Exp	CY Exp	BY1 Exp
PYQ1	.600			1.274		
PYQ2	3.569			.912		
PYQ3	4.239			1.423		
PYQ4	4.675			.741		
PYTot	**13.083**			**4.350**		
CYQ1	1.330	2.579		1.777	1.920	
CYQ2	.759	6.623		1.879	1.550	
CYQ3	.208	5.917		1.331	2.637	
CYQ4		6.286		1.426	1.435	
CYTot	**2.297**	**21.405**		**6.413**	**7.542**	
BY1Q1		2.014	1.283	1.541	2.157	.550
BY1Q2		.690	1.954	1.336	1.654	.720
BY1Q3		.841	2.112	.731	1.548	1.637
BY1Q4			2.847	.114	2.852	1.435
BY1Tot		**3.545**	**8.196**	**3.722**	**8.211**	**4.342**
BY2Q1			.594	.895	1.473	1.157
BY2Q2			.922		2.914	1.654
BY2Q3			.840		2.841	.911
BY2Q4					1.201	.852
BY2Tot			**2.356**	**.895**	**8.417**	**4.574**
BY2+1Q1					.768	
BY2+1Q2						1.636
BY2+1Q3						
BY2+1Q4						
BY2+1Tot					**.768**	**1.636**
Total of fiscal year	**15.380**	**24.950**	**10.552**	**15.380**	**24.938**	**10.552**

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/BUDGET ACTIVITY 7	R-1 ITEM NOMENCLATURE Program Element (PE) Name and No. **TECHNOLOGY DEVELOPMENT** **PE 0305191D8Z**

COST *(In Millions)*	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost			40.000						Continuing	Continuing

A. Mission Description and Budget Item Justification

Brief Description of Element: Technology Development is a classified program. Program details are provided in the classified Congressional Justification Book.

Program Accomplishments and Plans:

FY 2000 Accomplishments: n/a

FY 2001 Plans: n/a

FY 2002 Plans:

- Mission Support (40.000 million)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
APPROPRIATION/BUDGET ACTIVITY RDT&E, DEFENSE-WIDE/BUDGET ACTIVITY 7	R-1 ITEM NOMENCLATURE Program Element (PE) PE 0605116D8Z **TECHNOLOGY DEVELOPMENT**

B. Program Change Summary	FY2000	FY2001	FY 2002	Total Cost
Previous President's Budget Submission			0	Continuing
Appropriated Value				
Congressional Adjustment				
Adjustments for inflation, the Government-wide rescission, and program revisions			40.000	
Undistributed Cut				
Reprogramming				
President's Budget Submission			40.000	Continuing

Change Summary Explanation:

FY 2000 and FY 2001 funding maintained by Navy. $20 million transferred to OSD in FY 2002 and out.
FY 2002: Program adjustment ($20 million)

C. Other Program Funding Summary Cost: N/A

D. Schedule Profile: N/A