

Exhibit R-1, RDT&E Programs

Defense Threat Reduction Agency
(R-1 Line Item Summary)

Appropriation: RDT&E, Defense-Wide

Date: February 2000

R-1 Line Item No.	Program Element Number	Item	Budget Activity	TOA, \$ in Millions		
				FY1999 Cost	FY2000 Cost	FY2001 Cost
20	0602715BR	Nuclear Sustainment & Counterproliferation Technologies	2	210.0	214.5	230.9
30	0603160BR	Counterproliferation Support	3	51.9	80.6	77.4
38	0603711BR	Arms Control Technology	3	57.2	73.5	52.9
100	0605110BR	Critical Technology Support *	6	0.0	2.2	3.9
107	0605128BR	Classified Program	6	13.6	0.0	0.0
109	0605160BR	Counterproliferation Support	6	9.1	5.3	0.0
Total RDT&E Direct Program				341.8	376.1	365.1

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* Efforts funded under R-1 Line No. 100, PE#0605110T in FY99

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2					R-1 ITEM NOMENCLATURE Nuclear Sustainment & Counterproliferation Technologies; 0602715BR			
COST (In Millions)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete
Total 0602715BR Cost	210.0	214.5	230.9	237.8	244.7	249.1	230.9	Realigned
Project AB Test & Simulation Technology	61.7	64.5	0.0	0.0	0.0	0.0	0.0	Realigned
Project AC Weapon Systems Lethality	34.1	23.1	0.0	0.0	0.0	0.0	0.0	Realigned
Project AE Weapon Safety & Operational Support	31.8	38.8	0.0	0.0	0.0	0.0	0.0	Realigned
Project AF Weapon System Operability	43.1	44.5	0.0	0.0	0.0	0.0	0.0	Realigned
Project AG Scientific Computations & Information Systems	21.0	24.6	0.0	0.0	0.0	0.0	0.0	Realigned
Project AI Hard Target Tunnel Defeat and NTS Sustainment	10.9	10.5	0.0	0.0	0.0	0.0	0.0	Realigned
Project AL Classified Program	2.4	1.7	0.0	0.0	0.0	0.0	0.0	Terminated
Project AN Thermionics	3.0	2.9	0.0	0.0	0.0	0.0	0.0	Completed
Project AQ Deep Digger	2.0	3.9	0.0	0.0	0.0	0.0	0.0	Completed
Project BB Small Business Innovative Research	0.0	0.0	4.7	4.3	4.5	4.5	4.7	Continuing
Project BC Force Protection & Technology Applications	0.0	0.0	11.0	11.2	8.6	6.7	7.0	Continuing
Project BD Weapons Effects Technologies	0.0	0.0	60.7	62.8	68.7	75.8	80.0	Continuing
Project BE Testing Technologies & Integration	0.0	0.0	10.4	10.8	11.4	11.7	11.9	Continuing
Project BF CP Operational Warfighter Support	0.0	0.0	39.7	40.7	41.8	39.0	39.5	Continuing
Project BG Nuclear Operations	0.0	0.0	47.6	54.2	52.4	53.7	24.7	Continuing
Project BH System Survivability	0.0	0.0	56.8	53.8	57.3	57.7	63.1	Continuing

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A. Mission Description and Budget Item Justification

The mission of the Defense Threat Reduction Agency (DTRA) in the conduct of the Defense Wide/Applied Research RDT&E program is to reduce the threat to the United States and its allies from nuclear, biological, chemical (NBC), conventional and special weapons through counterproliferation (CP) programs; U.S. nuclear deterrent sustainment; and to provide technical support on weapons of mass destruction (WMD) matters to the DoD Components. These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2010 and are directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). Responsive to the oversight of the Counterproliferation Council and the Nuclear Weapons Council, the specific program entities are grouped into projects.

During its first year of operation, DTRA has faced many challenges in the process of focusing agency organization and resources to the threat reduction mission. This has required a transition from predecessor agencies' legacy programs and support baseline resources to integrated DTRA programs and resources. Particular attention has been devoted to realigning the research and development investment programs. The project structure in this PE for FY 2001 and out represents that realignment.

The DTRA Applied Research program is divided into the key areas of Nuclear Sustainment and Counterproliferation Technologies. The major budget items in development for these two areas follow:

Counterproliferation (CP):

The DTRA is the DoD focal point for programs and activities to reduce the threats posed by WMD proliferants. Former programs have been redirected and focused into six broad CP programs and three areas of enabling technologies to accomplish the counterproliferation mission. New, forward-thinking activities have been identified and prioritized to support the DTRA mission and the DoD CP strategy for responding to the full spectrum of crises and preparing now for an uncertain future. The CP programs support national guidance, the DTRA strategic vision, and Service and CINC operational customers. This program element provides the innovative technologies and concepts underpinning all CP programs.

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Mission Description and Budget Item Justification (cont'd)

- Vulnerability assessments of strategic U.S./Allied systems leading to strategies for improved survivability. Provides input to assessment training programs, engineering designs and new construction practices to support sound force protection, vulnerability mitigation, and collective protection principles.
- Development of WMD analysis and simulation tools for the warfighter including target planning and assessment; hazardous materials transport and collateral effects prediction; consequence assessment; and anti-terrorism/force protection.
- Development and application of state-of-the-art nuclear weapons effects models to support nuclear weapon stewardship and system hardness design.
- Development, maintenance, and use of unique DoD test and simulation facilities (to include infrastructure) and enabling technologies that are used to evaluate the impact of hostile environments from conventional, nuclear, and other special weapons on military or civilian systems or targets.
- Examination of existing U.S./Allied capabilities to hold hardened, deeply buried targets at risk; evaluation of capabilities against known or projected potential targets; and evaluation of new technologies for possible application against known shortfalls.
- Targeting and Intelligence Community (IC) support to warfighters that provides functional vulnerability assessments of hostile foreign systems.

Nuclear Sustainment:

The nuclear sustainment program, driven by the specific taskings of the National Strategy, National Military Strategy and the Joint Strategic Capabilities Plan, has two projects, i.e., Nuclear Operations and System Survivability.

- Nuclear Operations develops and supports the National Nuclear Mission Management Plan, Nuclear and WMD Emergency Response Capability, nuclear and WMD training expertise for

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Mission Description and Budget Item Justification (cont'd)

DoD, nuclear weapon systems safety assessments, nuclear planning systems, nuclear deterrent option analyses, technical support for nuclear C4I requirements and WMD threat mitigation analyses.

- The System Survivability Project develops simulator technology (nuclear, blast, thermal, radio frequency (RF) propagation, and optical/infrared (IR) background effects), electronics technology (radiation-hardened microelectronics, balanced electromagnetic hardening technology, radio frequency threat reduction), assessment and protection technology, and provides technology to support the Congressionally mandated Nuclear Test Personnel Review. These development areas directly support the development of survivable and reliable systems for the warfighter.

Together, the Counterproliferation Technologies and Nuclear Sustainment projects comprise a critical component of the ability of the Department to meet the technology and sustainment challenges posed by the emerging international environment and the National Military Strategy. The coverage of the projects ranges from counter-terrorism through conventional conflict through countering WMD threats to the maintenance of the national strategic nuclear deterrent. Through these projects, DTRA is a major contributor to the requirements posed by the Shape, Respond and Prepare strategy for the defense of the nation.

It should be noted that information concerning Project AL is classified per DoD Directive 0-5205.7, Para B.2.f.

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Project AB - Test & Simulation Technology - Development of effective, survivable, and economical weapon systems requires robust testing technologies and simulation capabilities to support acquisition managers, nuclear effects researchers, and decision-makers. This project develops, provides and maintains unique DoD test and simulation facilities and enabling technologies that are used by the Defense Agencies, the Services and other federal agencies to evaluate the impact of hostile environments from conventional, nuclear and other special weapons on military or civilian systems and targets. These facilities provide blast, thermal, electromagnetic pulse, mechanical impulse, ionizing radiation and radio frequency propagation environments and testbeds to support DoD and national test requirements. This project leverages fifty years of testing expertise to investigate weapons effects and target response to a spectrum of hostile environments that could be created by proliferant nations or terrorist organizations with access to advanced conventional weapons or weapons of mass destruction (nuclear, biological and chemical).

The project includes the upgrade of existing simulators and test support technologies to extend the utility and life of simulators, the decommissioning of under-utilized simulators, and the development of new simulators to support emerging customers from DoD/Department of Energy (DOE), National Security Agency (NSA), and U.S. Allies. Additionally, it provides the innovative, enabling technologies that make simulator enhancements and new facilities technically feasible and cost effective. Specific programs in this project include: 1) Based on user test requirements, maintain two existing test centers--one at Maxwell Physics International in San Leandro, California, and one at Arnold Engineering Development Center (AEDC) in Tullahoma, Tennessee, including the development, construction and checkout of the new Decade x-ray facility; development of technologies to provide enhanced radiation sources on the Decade simulator. 2) Development of communications and radar propagation effects simulators, and infrared and optical scene generators; partnership with Sandia National Laboratories (DOE) to develop technologies in energy storage, power flow, plasma switches, debris shields, and radiation sources that are applicable to stockpile stewardship and DoD strategic systems sustainment. 3) Characterization, optimization and operation of the Large Blast/Thermal Simulator (LB/TS) at White Sands Missile Range (WSMR), including the demonstration of a non-ideal airblast simulation capability. 4) Maintenance of the Advanced Research Electromagnetic Simulator

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Project AB - Test & Simulation Technology (cont'd)

(ARES) electromagnetic pulse (EMP) facility at Kirtland AFB. 5) Operation and maintenance of the Thermal Radiation Test Facility (TRTF) at Kirtland AFB. 6) Target defeat assessments for precision-guided and special weapons against Weapons of Mass Destruction (WMD) related targets. 7) Refurbishment, maintenance, characterization, and evaluation of the Magnetic Flyer Plate Facility for testing of stockpile systems in cooperation with the Department of Energy, U.S. Navy's Strategic Systems Programs, Lawrence Livermore National Laboratory, and Sandia National Laboratory. This Project is applicable to stockpile stewardship and DoD strategic systems sustainment.

The project provides test beds for full- and sub-scale tests that focus on weapon-target interaction with fixed, hardened facilities to include hardened aboveground bunkers, cut-and-cover facilities and deep underground tunnels. This effort supports the Services' requirements for hard target defeat testing and emphasizes teaming with the Services to assess weapon-target interaction of existing and developmental weapon systems. Specific activities include test bed design and construction, instrumentation and data collection, test coordination and execution, and post-test analysis and documentation.

This project relies on hardening and simulation technologies (Testable Hardware and Aboveground Testing/Underground Testing (AGT/UGT) Correlation) funded under Project AF and supports the evaluation of weapons lethality accomplished in Projects AC and AI. Funded programs support JCS Joint Warfighting Capabilities: Control Space, Counterproliferation, Discriminate Attack, Global Reach and Situational Awareness, and also provide support to STRATCOM, EUCOM, USFK (PACOM), and ACOM.

FY 1999 Accomplishments

Test & Simulation (\$22,765K)

Continued Radar Nuclear Effects Corruption and Simulators (RNECS) development for testing of the User Early Warning Radars (UEWRs).

Initiated development of the Wide Band Channel Simulator (WBS).

Began initial operational test planning for the Inflight Interceptor Communication Systems (IFICS).

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Project AB - Test & Simulation Technology (cont'd)

Developed a modified version of the RNECS corruptor software and installed it into the National Missile Defense (NMD) Ground-Based Radar (GBR) Hardware-in-the-Loop (HWIL) facility.

Initiated the development of the True Display Simulator to provide an infrared (IR) test set to support testing of IR focal planes.

Completed modifications to LB/TS for blast and thermal diagnostics. Tested one Navy ship decking and six Israeli tactical systems.

Continued to respond to emerging user testing needs through R&D upgrades.

Continued to provide high explosive (HE) simulation infrastructure and test support, and maintained Permanent High Explosives Test Site (PHETS) facility at WSMR and Chestnut Site at Kirtland AFB.

Completed large scale high explosive test in hard rock.

Continued to rehab test target facilities at WSMR.

Continued to support LB/TS maturing Non-Ideal Air Blast (NIAB) technology, window testing capabilities, and testing of vehicles against ideal nuclear airblast and thermal effects.

Continued HE infrastructure support of Phase 2 Advanced Concepts Technology Demonstration (ACTD), Antiterrorism, and Hard Target Defeat (HTD) Testing.

Continued phenomenology testing of penetration of weapons into rocks and into damaged concrete. Continued penetration testing into granite. Initiated testing into limestone.

Continued Joint Attack Stand-Off Missile (JASSM) infrastructure test support of three out of five fundamental target types. JASSM program also supports the CP and HTD program.

Continued Advanced Research Electromagnetic Simulator (ARES) refurbishment effort.

Completed ARES support of small operation testing and the TRW, Inc., Army tent tests.

Radiation Simulators (\$24,889K)

Completed closure of the high power microwave facility at Maxwell Physics International.

Continued to support ongoing nuclear weapons effects (NWE) testing programs by maintaining DTRA's suite of radiation simulators.

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Project AB - Test & Simulation Technology (cont'd)

Demonstrated high-spectral fidelity hot x-ray sources on the PITHON simulator.
 Demonstrated and deployed quick-turnaround, cold x-ray diagnostic system to improve user testing efficiency.
 Continued development of large survivable passive debris shields for cold x-ray testing on the Double-EAGLE simulator.
 Completed Decade Quad in the hot x-ray mode at AEDC.
 Optimized Decade Quad hot x-ray source performance for user testing.
 Initiated development of the Decade cold x-ray source to include the power flow technology to combine the four modules.
 Developed Decade improvement program for power flow technologies to support improved fidelity and intensity of x-ray sources.
 Demonstrated 50% increase in the efficiency of long-implosion soft x-ray sources in support of Decade and future x-ray simulators.
 Demonstrated high-fidelity cold x-ray sources on the Z facility at Sandia National Laboratories.
 Demonstrated active debris mitigation techniques for debris-free exposures greater than 300 cm².
 Developed current density-imaging, plasma radiation source (PRS) diagnostics with demonstration of a Plasma Opening Switch (POS) diagnostic.
 Doubled efficiency of laser plasma x-ray sources for nuclear weapons effects testing, using the Nova laser, and commenced development of improved sources using the Omega laser.
 Continued development of a transportable, compact, high-fidelity hot x-ray simulator for in-plant electronics testing.

Weapon/Target Interaction (\$12,775K)

Developed and validated tunnel targeting capability for system component level.
 Continued to construct and rehab test target facilities, provide utilities, to maintain the construction capability infrastructure, and to execute tests for CP, HTD, and Hard and Deeply Buried Targets (HDBT) programs.

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Project AB - Test & Simulation Technology (cont'd)

Continued tunnel testbed facility outfitting and utilization in tunnel defeat demonstration series.

Initiated design of second tunnel facility.

Continued to develop signature requirements and munitions effectiveness assessment for hard target defeat.

Collected operational signatures for tunnel testbed facility.

Began rehab of industrial targets for the assessment of WMD component damage, target response, and collateral effects for conventional weapons and enhanced payloads.

Small Business Innovative Research (SBIR) (\$1,314K)

Supported the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Executed Agency-approved SBIRs.

FY 2000 Plans

Test & Simulation (\$30,613K)

Complete RNECS development and begin initial operational tests for NMD.

Develop mitigation techniques for GBR in a nuclear-disturbed environment for incorporation into RNECS to support testing.

Continue communication/radar atmospheric effects simulator participation in operability assessment/warfighting exercises.

Evaluate NMD UEWRs for operability and continue advanced SATCOM Simulation Test

Support to MILSTAR, IFICS, and Global Positioning System upgrades.

Develop advanced optical scene generator techniques and capabilities to support testing of NMD IR sensors.

Continue to provide HE simulation infrastructure and test support, and maintain PHETS facility at WSMR and Chestnut Site at Kirtland AFB.

Continue to rehab test target facilities at WSMR.

Complete LB/TS NIAB development and tests, improve window testing capabilities, and continue testing of vehicles against nuclear airblast and thermal effects.

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Project AB- Test and Simulation Technology (cont'd)

Continue HE infrastructure support of Phase 2 ACTD, Antiterrorism and HDT Testing.

Continue phenomenology testing of penetration of weapons into rocks and into damaged concrete.

Continue penetration into limestone and complete testing into damaged concrete.

Continue infrastructure support of JASSM test support of three fundamental target types.

Radiation Simulators (\$24,643K)

Continue to support ongoing nuclear weapons effects testing programs by maintaining DTRA's suite of radiation simulators.

Upgrade cold x-ray, debris-free test capabilities on Double-EAGLE at Maxwell.

Initiate and complete Advanced Concepts Experiments (ACE-4) research and development testbed closure.

Upgrade control systems on radiation simulators at Maxwell Physics International for improved reliability.

Enhance remote on-line simulator access data encryption and access control capabilities.

Complete hardware modifications to the Decade Quad for the cold x-ray mode at AEDC.

Demonstrate a 30% increase in the hot x-ray dose and improved reproducibility on the Decade Quad.

Continue the development of power flow and high-dose and high-dose-rate hot x-ray technologies to support improved fidelity and intensity of Decade x-ray sources.

Initiate development of active debris mitigation techniques for debris-free exposures on the Decade Quad greater than 500 cm².

Continue the development of improved efficiency long-implosion cold x-ray sources in support of Decade and future x-ray simulators.

Demonstrate and characterize high-fidelity plasma radiation sources on the Z facility at Sandia National Laboratories.

Complete conversion of high-density plasma models to high-performance computers.

Complete the development of the Compact X-Ray Simulator and begin the demonstration phase at a system developer's plant.

Demonstrate distributed laser-produced x-ray source technology.

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Project AB - Test & Simulation Technology (cont'd)

Continue risk reduction planning and the development of technology to dramatically improve the capability of non-nuclear x-ray test facilities.

Weapon/Target Interaction (\$8,068K)

Conduct operational tunnel defeat demonstrations using existing and developmental weapons.

Demonstrate reconstitution times and costs after each demonstration.

Collect signatures of the tunnel facility for characterization before, during, and after each weapon application.

Exercise target planning tools through each of the participating CINCs.

Initiate construction of tunnel facility #2 of a different functional type in a different geology.

Complete penetration testing into limestone and damaged concrete.

Conduct weapon lethality experiments to evaluate new weapons for functional defeat of tunnel facilities.

Small Business Innovative Research (\$1,176K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

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Project AC - Weapons Systems Lethality - This project addresses the lethality of the full spectrum of weapons, including advanced conventional and nuclear weapons, against the target base of today and tomorrow -- ranging from ultra-hard underground facilities to above ground, unhardened surface facilities and other special facilities that may be associated with the production, storage or deployment of weapons of mass destruction. Helping to maintain the continued effectiveness of the nuclear deterrent, this project also seeks to provide decision makers and warfighters expanded conventional weapon options against well-protected, high-priority targets. The program relies extensively on advanced numerical methods, as well as laboratory scale experiments, intermediate and full-scale field tests and operational test data to quantify functional and physical damage criteria and collateral effects. Project results will be provided to operational planners through PC-Based analytic prediction and visualization tools, multimedia hypertext databases, and technical manuals. Central to this support is an automated expert system to assist in pre-strike target planning and post-strike battle damage assessment. Technology developed in this project will also enable civil agencies to assess engineering designs to mitigate direct and collateral damage from terrorist attacks such as occurred at the Oklahoma City Federal Building, Khobar towers attack in Saudi Arabia, and the U.S. Embassies in West Africa. Additionally, the technology developed directly supports force protection issues, operations other than war and DoD support to civil authority.

On a broader scale, improvements in weapon effects and target response codes will be used to upgrade and expand physics-based modeling and simulation. These improved codes include: coupled finite difference-finite element codes, structure-medium interaction codes, groundshock propagation codes suitable for jointed and/or layered media and high resolution dynamic codes capable of predicting the transport of hazardous aerosol clouds over complex terrain. The understanding of weapon-target interaction resulting from this project will support the generation of weapon system requirements for the changing worldwide target base and provide a quantitative basis for planning contingency operations against high value targets. It will also improve the understanding of target/weapon interactions and their consequences for battle damage prediction and assessment. The project also allows the assessment of collateral effects from counterforce attacks, military strikes, terrorist action, incident or accident from nuclear facilities.

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Project AC - Weapons Systems Lethality (cont'd)

Project AC also includes the development of advanced weapons hardware technology. It supports the development of high power electromagnetic (EM) source technology for warfighting applications and hardening technologies for emerging radiofrequency (RF) threats. This project also includes electrothermal chemical (ETC) gun advanced technology and projectile lifting body programs per memorandum of agreement (MOA) with the Navy; ETC gun technologies for direct-fire (tank) applications, per MOA with the Army; and initiates development of ETC gun technologies for future indirect fire (artillery) Army applications.

FY 1999 Accomplishments

Nuclear Weapons Effects Phenomenology (\$7,342K)

Provided technical support to Director of Military Support (DOMS) and Federal Emergency Management Administration (FEMA) under Federal Response Plan Exercise and special event support.

Delivered new operational commander exposure guidance to NATO.

Developed initial Electromagnetic Pulse Vulnerability Number (EMP-VN) methodology.

Provided on site training and operational support during NATO Able Alley.

Provided support for Air Force Agent Defeat weapons phase study.

Supported OSD theater nuclear force study.

Provided weapons effects support to STRATCOM-led SAND DUNE Study.

Supported Joint-Staff India Pakistan study.

Weapon/Target Interaction (\$12,005K)

Developed detailed analysis of blast effects on First and Third Generation Aircraft Shelters to include the effects on stored assets and protection viability.

Provided technical support, hardware/software to integrate weapons effects, target response codes in distributive interactive environment.

Developed 3-dimensional, real-time visualization of targets with variable damage levels from physics-based weapon effects.

Developed an initial multi-weapon attack model for Munitions Effects Assessment (MEA).

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Project AC - Weapons Systems Lethality (cont'd)

Participated in a Joint ALLIED FORCE MEA exploitation team that gathered "ground truth" of attacks against high value targets in Kosovo.

Received accreditation of MEA 3.1 by the Joint Technical Coordinating Group for Munitions Effectiveness (JTTCG/ME).

At the request of Deputy Secretary of Defense, executed a full-scale truck bomb test for forensic analysis of the Kohbar Tower Terrorist bombing.

Produced and distributed over 500 copies of the CD-ROM revision of the Design and Analysis of Hardened Structures (DAHS) manual and began work on an update to DAHS, based on state-of-the-art technology.

Completed field-scale and full-scale testing to reduce the uncertainty of penetration tests into rock, weathered rock, and hardened targets using advanced weapon concepts.

Initiated the Integrated Target Planning Tool Set (ITPTS) that provides the warfighter a standardized weaponeering framework for a full spectrum of weapons and targets.

Released Hazard Prediction and Assessment Capability (HPAC) version 3.2, a suite of software tools supporting target planning and collateral effects mitigation on WMD targets.

Provided Operational Planning/Battle Damage Assessment to support JCS Deputy Directorate for Targets (J2T) for Operation Desert Viper, Desert Fox, and Allied Force NATO operations.

Provided WMD and industrial hazard assessment for each associated target nomination during Operation Allied Force, Desert Fox, and other classified operations.

Integrated HPAC tools into Joint Warning (JWARN) and Reporting system.

Integrated HPAC into Army's Space and Missile Defense Command Post Engagement Ground Effects Model (PEGEM) theater missile engagement code.

Briefed comprehensive HPAC Verification and Validation (V&V) Program to Chemical and Biological Community.

Developed and maintained Automated Weather Data Servers providing full-time, classified and unclassified, world-wide weather support for all HPAC users.

Maintained selected Air Force and Navy weather forecast and observation products.

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Project AC - Weapons Systems Lethality (cont'd)

Maintained ETC plasma ignitors, to overcome temperature-induced performance degradations.

Completed pack-up for transportation of the Green Farm Electric Gun R&D Facility so as to vacate Marine Corps Air Station Miramar (due to BRAC realignment) by 30 Sep 99.

Maintained EM gun firing operations until Dec 98 in support of the United States/United Kingdom (U.S./U.K.) program and ETC phenomenology and gun testing operations until Jun 99.

Demonstrated in a five-round repeatability firing series—a 39% increase in muzzle energy performance from the M256 120mm tank gun.

Demonstrated performance of lightweight composite five-inch gun rocket powered projectile at Wallops NASA firing site.

Completed isotopic inventories for reprocessing facilities and time-varying reactor source terms.

Integrated worldwide population database into HPAC and Consequence Assessment Tool set (CATS), providing nuclear casualty estimates and a readily updateable database capability.

Technical Information (\$1,247K)

Completed and demonstrated integrated NWE computational aids.

Updated 2 chapters of Effects Manual-1 (EM-1).

Application of Nuclear Weapons Expertise (\$13,082K)

Constructed brassboard compact power sources.

Defined the vulnerability of nuclear reactors and nuclear reprocessing facilities to advanced conventional weapons effects.

Applied High Power Microwave/Electromagnetic (HPM/EM) hardening technology to critical, disaster recovery, communications hub in partnership with the U.S. Telecommunications industry.

Reviewed the lethality models for Soviet missile silos in light of current technical information to support a Defense Intelligence Agency (DIA) request. Supported revision of vulnerability number (VN).

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Project AC - Weapons Systems Lethality (cont'd)

Fielded a Beta test version of an assessment tool for evaluating vulnerabilities to radio frequency attack. This software modeling product is capable of estimating backdoor protection requirements using innovative cavity absorption and device rectification models completed under science and technology (S&T) contracts.

Completed the laboratory phase of a retrofit protection hardware research effort and began the verification phase with a full-scale field test. This effort quantified the benefits of various protection techniques, developed new measurement processes, and developed new measurement hardware needed to analyze and quantify protection for RF attack.

Completed the basic material and design research on monolithic microwave integrated circuit (MMIC) protection devices. Commenced planning to build a prototype device for sensitive communication receiver protection.

Developed a totally passive version of the popular Witness Chip RF detector. This device features a unique, unpowered fiber optic sensor head.

Completed the laboratory phase of studying the behavior and quantifying the parameter associated with forming retrofit RF protective layers from mesh materials.

Small Business Innovative Research (\$451K)

Supported the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Executed Agency-approved SBIRs.

FY 2000 Plans

Nuclear Weapons Effects Phenomenology (\$5,342K)

Distribute completed Volumes 1 and 3 of Nuclear Weapon Manual and Output Handbook.

Complete evaluation of targeting techniques for high enthalpy tunnel airblast for STRATCOM.

Complete initial 2-dimensional nuclear weapon output calculations for strategic systems.

Complete EMP-VN system development for long lines for STRATCOM and DIA.

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APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Applied Research - BA2	R-1 ITEM NOMENCLATURE Nuclear Sustainment & Counterproliferation Technologies; 0602715BR

Project AC - Weapons Systems Lethality (cont'd)

Complete electronic interactive version of the EM-1 nuclear phenomenology/effects series.

Complete the development of a lethality and collateral effects assessment tool for nuclear strikes on a full spectrum of WMD targets for NATO and STRATCOM.

Implement HEMP and Source Region EMP Targeting Applications (SREMPTAPS) tools for DIA-specified potential threat weapons.

Continue the development of models of long term impact of nuclear hazards on the ecosphere.

Complete the ground motion analysis of Degelan tests.

Initiate non-ideal airblast phenomenology update.

Complete fallout micro-physics modeling leading to updated fallout code.

Technical Information (\$938K)

Update final chapters of Effects Manual-1.

Continue Project Graybeard archiving efforts.

Applications of Nuclear Weapons Expertise (\$9,071K)

Develop and integrate MEA for application of nuclear weapons to defeat WMD targets, agents and material.

Develop both physical/functional defeat models for enhanced warhead concepts such as high temperature incendiary.

Develop advanced solid-state technology for microwave applications with a service partner.

Integrate RF detection device ("Witness Chip") into existing commercial off the shelf (COTS) and military specification (MILSPEC) equipment.

Complete the joint assessment of mobile telecommunications hardware susceptibility to radio frequency threats.

Incorporate innovative monolithic integrated circuit (MMIC) limiter device using substrate conduction into a sensitive communication receiver in cooperation with the Office of Naval Research.

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Project AC - Weapons Systems Lethality - (cont'd)

Investigate various advanced composite materials to develop a frequency selective shielding capability to pass desired signals, but inhibit damaging signal frequencies.

Weapon Target Interaction (\$5,771K)

Deliver Lethality/Vulnerability models for reinforced-concrete wall damage due to internal and soil bursts to MEA 4.0.

Release MEA technology preview to support CP and Tunnel Defeat Demonstration (TDD) programs. Include Joint Attack Stand-Off Missile (JASSM) and Tactical Tomahawk Penetration Variant (TTPV) in this technology preview.

Deliver IMEA 4.0 to the warfighter in fall of FY00.

Upgrade reinforced-concrete wall damage models for MEA 5.0

Integrate into MEA 5.0 new reinforced-concrete wall damage models.

Obtain accreditation for the MEA 4.0 that includes the Tunnels Module.

Conduct an Integrated Target Planning Tool Set (ITPTS) functionality demonstration.

Deliver ITPTS version 1.0 to the warfighter.

Complete an anti-terrorism (AT) analysis of the National Military Command Center, vital facilities in Washington, DC, and embassies for Department of State, and assist in the analyses of high-interest facilities in the Washington, DC area.

Complete a forensic analysis of East African terrorist bombings in association with the FBI.

Deliver preliminary computational structural dynamics (CSD) code using advanced numerical methods.

Develop new, fast-running algorithms for use in AT Planner, using the best available computational fluid dynamics (CFD) codes to define blast loads, and CSD codes to assess structural and personnel hazards.

Conduct precision wall damage tests on hardened reinforced concrete walls.

Convene Nuclear Regulatory Commission (NRC) panel to develop V&V guidelines for CSD codes.

Continue enhancement of Protective Structures Analysis and Design System.

Establish a Conventional Weapons Effects Database.

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Project AC - Weapons Systems Lethality - (cont'd)

Complete a Battle Damage Assessment of high-value targets in Kosovo, in association with the FBI.

Complete a Force Protection Analysis of key Command and Control Complexes in Kosovo, in association with Force Protection Branch.

Test and Simulation (\$1,285)

Demonstrate HE charge design for tunnel airblast simulation.

Execute proof-of-principle nuclear airblast in tunnel simulation.

Small Business Innovative Research (\$644K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

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Project AE - Weapon Safety and Operational Support - This project is critical to the maintenance of a safe, secure and reliable nuclear deterrent. Stockpile support efforts in this project include nuclear weapons stockpile technology for weapon system sustainment, probabilistic risk-based system safety assessments, and nuclear physical security policy/requirements validation. Reliability efforts include participation and assistance to Dual Revalidation, Annual Certification, and the Stockpile Stewardship Program. This project performs research and development in support of nuclear contingency planning, force structure deployment and employment options, innovative nuclear command and control concepts, nuclear mission planning, vulnerability assessments, safety assessments, advanced survivability concepts, and theater missile defense against Weapons of Mass Destruction (WMD) delivery systems and warheads. Vulnerability assessments of DoD and Allied fixed and mobile Command, Control and Communications (C3) assets subjected to WMD effects are also part of this project. This project includes Modeling and Simulation Center efforts to integrate weapons effects into High Level Architecture (HLA) compliant environments to support operational training and exercise. Oversight, technical support and curriculum review for the Defense Nuclear Weapons School (DNWS) and other DoD nuclear training activities are also provided.

This project is in direct support of Presidential Decision Directives (PDD) and taskings and requirements from OSD, the Joint Staff and CINCs. Relevant directives include National Security Strategy of Engagement and Enlargement, National Security Science and Technology Strategy, National Military Strategy, Joint Strategic Capabilities Plan, Presidential Decision Directives, Defense Planning Guidance, and prioritization memorandums from CINCs. These efforts have been closely coordinated with Joint Staff, OSD offices, CINCs and Services, Department of Energy, Federal Emergency Management Agency and the Federal Bureau of Investigation. The thrust of this project supports the JCS Joint Vision 2010 Warfighting Capabilities of Dominant Maneuver, Precision Engagement, and Full-Dimensional Protection.

FY 1999 Accomplishments

Nuclear Operations (\$17,859K)

Continued the safety assessment for the dual capable fighter aircraft in Europe.

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Project AE - Weapon Safety and Operational Support (cont'd)

Continued the safety assessment of the B-52H aircraft.
 Began B-2 Weapon System Safety Assessment (WSSA) at the request of the Air Force Safety Center.
 Analyzed and quantified DOE Nuclear Detonation Safety Exceptions (NDSEs).
 Conducted Fuel Fire Modeling and Testing to support ongoing WSSAs.
 Developed a WSSA data base to archive completed WSSAs.
 Began storage vault blast effects testing and analysis at the request of the Air Force Safety Center.
 Began development of portable, mobile, and rapidly deployable radiation detection and measurement system comprised of remote sensor linked to central receiving/processing station via Radio Frequency (RF) signals.
 Conducted Forces Support nuclear and WMD technical analyses as required by CINCs, Services, Joint Staff, OSD, and Nuclear Weapons Council (NWC) on force structure, weapons safety and security, theater missile defense, counterproliferation, planning, and international military and political security issues.
 Completed WMD Threat Analyses for Aerial and Sea Ports of Debarkation for Strategic Air and Sea Lift.
 Delivered the NATO Nuclear Planning Systems Training System prototype to Supreme Headquarters Allied Powers Europe (SHAPE).
 Completed DTRA role in the development of the Air Vehicle Planning System project with transfer of the program to STRATCOM.
 Completed the DTRA initial support effort for the Nuclear Target Data Feed project of NATO targeting support.
 Completed deterrence framework analyses (China, INDO-PAK, Non-State Actors, Iraq) in support of requirements from STRATCOM, USFK/PACOM, CENTCOM, Assistant Secretary of Defense (ASD) (Strategy & Threat Reduction), ASD (Special Operations & Low-Intensity Conflict)(SOLIC), and Director, Counterproliferation Policy.
 Completed coordination of and planning for USAFE Force-on-Force (FoF) exercise.
 Completed planning support and asset allocation in support of AFSPACECOM/20th AF for ICBM Security engineering test plan.

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Project AE - Weapon Safety and Operational Support (cont'd)

Completed initial planning and definition of FoF test program for ICBM facilities. Completed consequence management support to ACOM for development of the requirements and training of DoD response forces.

Continued deterrence framework analyses as requested by CINCs and OSD.

Continued workshops and area focus reports examining the future international context as it impacts nuclear and WMD options, planning requirements and deterrence.

Continued NATO nuclear planning support, especially analyses of future C4I and planning systems for nuclear operations and WMD threat analyses.

Continued European Theater support issues (Joint Theater Surety Management Group, High Level Group, dual capable aircraft operations, NATO WS3 vaults, Replacement Training Weapon (RTW)).

Continued nuclear support for PACOM-operational issues/nuclear options.

Continued prediction calculation (PdCALC) system support and integration with U.S. Army Nuclear and Chemical Agency (USANCA) nuclear effects model.

Continued Single Integrated Operational Plan (SIOP) support for STRATCOM J-5.

Continued WMD threat analysis for CENTCOM/USFK/TRANSCOM, focused on the chemical threat to air and infrastructure operations.

Prepared and provided direct support to NATO nuclear exercises (Able Staff) and assisted with nuclear exercises Able Crystal and Able Ally.

Continued to provide quick-turn analysis on WMD consequence issues for OSD, Services, and Joint Staff and provide weapons effects analysis to weapons Project Officer's Groups and weapons modification programs as required.

Continued development of an integrated reporting system for automated reporting of NBC activity and hazard predictions.

Provided support to the CINC planning staffs on NBC capability and impacts on warfighting capability.

Developed mission and consequence analysis for HQ Air Combat Command's (ACC) Agent Defeat Weapon phase studies and Analysis of Alternatives (AOAs).

Education/Training to Maintain Core Competencies (\$1,037K)

Provided nuclear operational training support to CINCs, Services, and OSD.

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Project AE - Weapon Safety and Operational Support (cont'd)

Continued development of general interest DoD nuclear training program.
Continued development, improvement, and integration of course materials for the DNWS.
Supported DoD and CINC exercises and wargames with WMD/target response analysis.
Expanded expertise outreach program to OSD and War Colleges.
Initiated a nuclear/WMD "train-the-trainer" program for the DNWS.
Provided vulnerability assessment training to critical infrastructure components.

Nuclear Weapons Stockpile Programs (\$990K)

In support of stockpile stewardship and reliability, continued participation in, and support to, the Dual Revalidation program with research, technical analysis, and assessment reports.
Provided technical support and recommendations to OSD, Joint Staff, Services, STRATCOM and other Combatant Commanders related to weapons safety, reliability, and performance.
Continued support to the Annual Certification program and support to the services' weapons life-extension programs.
Provided management and technical support to DoD programs for sustainment of the nuclear deterrent, and began development of a DoD-wide Nuclear Mission Management Plan (NMMP).

Modeling and Simulation (\$3,466K)

Upgraded and refined operations of the WMD Assessment and Analysis Center.
Continued integration of the lethality tool set with weather modules, underground target data, and the effects of enhanced payloads.
Continued technical and advanced modeling and simulation support to CINC sponsored exercises world-wide.
Provided an integrated program for analysis and testing of alternate strategies, force employment options and technologies.
Continued to provide technical and operational consequence analysis support for exercises and wargames.
Began development of a WMD model to include the use and effects of WMD in a joint theater-level simulation.

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Project AE - Weapon Safety and Operational Support (cont'd)

Implemented the Analysis and Assessments program to provide real-time support to Services and CINCs through enhanced infrastructure, deployment teams, integrated models, and technical support.

Updated and refined support database per CINCs, Services, and Joint Staff guidance and continued development of consequence analysis of WMD counterproliferation programs.

Nuclear Weapons Effects Phenomenology (\$1,171K)

Integrated the services' global and regional scale models with in-theater high resolution capability to provide seamless weather input for hazard prediction assessment from continental to local scale.

U.S./Allied Survivability & Operability in Nuclear/Designated Advanced Weapons Environments (\$5,942K)

Conducted Balanced Survivability and Integrated Vulnerability Assessments on DoD facilities as tasked by CINCs, Joint Staff, OSD, and NATO.

Assisted CINCs and intelligence community in target planning against hard and deeply buried facilities.

Conducted integrated vulnerability assessments of defense and critical national infrastructure facilities.

Applied sensor technology for target detection, target characterization and battle damage assessments.

Conducted two nuclear command and control mission assessments.

Conducted over 200 Chessmaster briefings to Flag/General Officer/senior civilian personnel in DoD and other government organizations.

Completed Phase I of Global Assessment of a major DoD support system.

Weapon/Target Interaction (\$1,364K)

Developed visualization tools for weapon effects models that are compatible with the High Level Architecture (HLA).

For a particular legacy model or simulation, continued to define a Simulation Object Model (SOM), integrated the Runtime Infrastructure (RTI) and HLA functionality into that model, and transformed the model's data structure into the SOM data representation.

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Project AE - Weapon Safety and Operational Support (cont'd)

Established a Weapons Effects Federation Object Model to allow interaction between SOMs and to effect the passing of weapons effects data between simulations.

FY 2000 Plans

Nuclear Operations (\$20,682K)

- Complete the safety assessment for the dual capable fighter aircraft in Europe.
- Complete the safety assessment of the B-52H aircraft.
- Continue B-2 WSSA.
- Continue to analyze and quantify DOE NDSEs.
- Conduct modeling and testing to support ongoing WSSAs.
- Continue the development and population of the WSSA database to archive completed WSSAs.
- Begin the C-17 Aircraft Transportation Study.
- Continue Storage Vault Blast Effects Testing and Analysis.
- Continue development of portable, mobile, and rapidly deployable radiation detection and measurement system, comprised of remote sensor linked to central receiving/processing station via Radio Frequency (RF) signals.
- Continue to conduct Forces Support nuclear and WMD technical analyses as required by OSD, Services, Joint Staff, and NWC on force structure, weapons safety and security, theater missile defense, counterproliferation, planning and international military and political security issues.
- Continue to conduct technical analyses to support CINCs, concerning nuclear and WMD operational force planning, counterproliferation, nuclear forces, command and control, and regional security issues in light of the changing international security environment.
- Continue to provide deterrence framework analyses as requested by CINCs and OSD.
- Continue to provide workshops and area focus reports, examining the future international context as it impacts nuclear and WMD options, planning requirements and deterrence.
- Continue to support NATO nuclear planning, especially analyses of future C4I and planning systems for nuclear operations and WMD threat analyses.

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Project AE - Weapon Safety and Operational Support (cont'd)

Continue to support European Theater issues (Joint Theater Surety Management Group, High Level Group, dual capable aircraft operations, NATO WS3 vaults, Replacement Training Weapon (RTW)).

Continue to provide nuclear support for PACOM operational issues/nuclear options.

Continue to provide PdCALC system support and integration with U.S. Army Nuclear and Chemical Agency (USANCA) nuclear effects model.

Continue to provide SIOP support for STRATCOM J-5.

Continue to provide WMD threat analysis for CENTCOM/USFK/TRANSCOM, focused on the chemical threat to air and infrastructure operations.

Maintain support to NATO nuclear exercises Able Staff, Able Ally and Able Crystal.

Provide analytical support in assessing STRATCOM's capability to effectively meet national objectives involving the SIOP, based on potential changes to the threat, national policy, and force structure.

Conduct an annual force-on-force (FoF) exercise to evaluate and validate policy standards as designated by the Security Policy Verification Committee (SPVC). Conduct FoF exercise in coordination with AFSPACECOM and 20th AF for ICBM security.

Complete SHAPE Survive to Operate (STO) analysis for NATO out-of-area operations.

Continue to provide quick-turn analysis on WMD consequences issues for OSD, Services, and Joint Staff and provide weapons effects analysis to weapons Project Officer's Groups and weapons modification programs as required.

Continue development of an integrated reporting system for automated reporting of NBC activity and hazard predictions.

Continue to provide support to the CINC planning staffs on NBC capability and impacts on warfighting capability.

Continue to develop mission and consequence analysis for HQ ACC Agent Defeat Weapon phase studies and AOA's.

Continue to provide analysis to the CINCs in support of their counterproliferation development missions.

Education/Training to Maintain Core Competencies (\$646K)

Continue to provide nuclear operational training support to CINCs, Services, and OSD.

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Project AE - Weapon Safety and Operational Support (cont'd)

Continue development of general interest DoD nuclear training program.
Continue development, improvement, and integration of course materials for the DNWS.
Continue to support DoD and CINC exercises and wargames with WMD/target response analysis.
Continue to expand expertise outreach program to OSD and War Colleges.
Continue the nuclear/WMD "train-the-trainer" program for the DNWS.

Nuclear Weapons Stockpile Programs (\$2,568K)

In support of stockpile stewardship and reliability, continue participation in, and support to, the Dual Revalidation and DOE Baseline programs with research, technical analysis, and assessment reports.
Continue to provide technical support and recommendations to OSD, Joint Staff, Services, STRATCOM and other Combatant Commanders related to weapons safety, reliability, and performance.
Continue support to the Annual Certification program and support to the services' weapons life-extension programs.
Continue to provide management and technical support to DoD programs for sustainment of the nuclear deterrent. Continue development and update of the DoD Nuclear Mission Management (NMMP) as directed.
Begin development of the Virtual Underground Test Program, which will use a combination of codes, models, simulators, and legacy test data to evaluate weapons system survivability, in support of requirements to maintain a survivable nuclear stockpile.

Modeling and Simulation (\$8,975K)

Continue to upgrade and refine operations of the WMD Assessment and Analysis Center.
Complete the development of a three dimensional, physics-based, weapons effects simulation, which includes weather modules, underground target data, and the effects of enhanced payloads.
Continue to provide technical and advanced modeling and simulation support to CINC sponsored exercises world-wide.

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Project AE - Weapon Safety and Operational Support (cont'd)

Continue to provide an integrated program for analysis and testing of alternate strategies, force employment options and technologies in a WMD environment, using state-of-the-art simulations.

Continue to provide technical and operational consequence analysis support for exercises and wargames.

Complete the development of a WMD module to allow the assessment of WMD operational plans, using existing joint theater-level simulations. Continue to implement the Analysis and Assessments program to provide real-time support to Services through enhanced infrastructure, deployment teams, integrated models, and technical support.

Continue to update and refine support database per CINCs, Services, and Joint Staff guidance and continue development of consequence analysis of WMD counterproliferation programs.

Maintain permanent (virtual) presence at the Joint Warfare Simulation Center (JWARS) and the Joint Simulation System (JSIMS), supporting WMD modeling within these critical programs.

U.S./Allied Survivability & Operability in Nuclear/Designated Advanced Weapons Environments (\$5,388K)

Continue to conduct Balanced Survivability and Integrated Vulnerability Assessments on DoD facilities as tasked by CINCs, Joint Staff, and OSD.

Continue to assist CINCs and intelligence community in target planning against hard and deeply buried facilities.

Continue to conduct integrated vulnerability assessments of defense and critical national infrastructure facilities.

Continue to apply sensor technology for target detection, target characterization and battle damage assessments.

Begin integration of infrastructure and event data into FBI Geographic Information System (GIS)-based tools.

Begin assessments and verification and validation of potential WMD scenarios and impacts.

RDTE&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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Project AE - Weapon Safety and Operational Support (cont'd)

Begin implementation and testing of approved WMD mitigation strategies, CBR filtration, sensors, flow test, structural/window/heating, ventilation, and air conditioning (HVAC) system retrofit(s).

Weapon/Target Interaction (\$559K)

Continue development of visualization tools for weapon effects models that are compatible with the HLA.

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Project AF - Weapon System Operability - Current and future warfighters and weapon systems, including the associated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and support systems/equipment, must be able to survive and operate effectively through a spectrum of hostile environments. Planned efforts emphasize the development and demonstration of innovative and cost effective technologies to sustain the operability of U.S. and Allied Forces and systems to advanced conventional weapons, special weapons and limited nuclear attack. Military systems of interest include those that support military missions in the air, on land, at sea, or in space. The Smart Building program supports the software, modeling and simulation development to support a Joint Operations Center (JOC) with the FBI. Models will be consistent with existing FBI GIS-based tools and Responder Assets Management System (RAMS) integration. The Smart Building effort will provide the portable WMD equipment, and will also provide for facilities inspections and retrofits.

This project constitutes the DoD's resident science and technology expertise in nuclear and related operability matters. It develops and demonstrates affordable strategies and hardening technologies for U.S. systems; transfers the technical products to acquisition program offices; conducts component, subsystem, system and end-to-end performance testing and assessments as requested by the Services and CINCs; and provides support to the Office of the Secretary of Defense on technical and policy matters that relate to the acquisition of survivable systems and strategic system sustainment. Specific programs in the project include: development and demonstration of the enabling technologies for ensuring the continued availability of special materials and radiation-hardened microelectronics and photonic devices; development and demonstration of affordable hardening and mitigation methods that treat the adverse effects from electromagnetic, natural space and nuclear weapons engendered radiation (i.e., ionizing radiation and displacement damage), nuclear electromagnetic pulse (EMP), high power microwave (HPM) and nuclear atmospheric environments; direct support to warfighters by predicting and quantifying the operational impact/risk of nuclear, biological and chemical (NBC) and conventional battlefield environments on systems and personnel; development and demonstration of cost-effective system design and test certification techniques for

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Project AF - Weapon System Operability (cont'd)

testable hardware that do not require underground nuclear tests; methods for measuring and increasing soldier effectiveness on NBC battlefields; performance and cost analysis to support the Defense Acquisition Board; and joint efforts with system program offices to apply the Agency's expertise and technologies to specific Service applications.

This project provides the testable system design rules and protocols for users of nuclear effects simulators that are funded in Project AB. It also supports the following JCS Joint Warfighting Capabilities: Information Superiority, Counterproliferation, Electronic Warfare, and Precision Force.

FY 1999 Accomplishments

Nuclear Weapons Effects Phenomenology (\$10,534K)

- Supported Air Force Office of Testing and Evaluation Center (AFOTEC) Space-Based Infrared Satellite (SBIRS) Low Earth Orbit (LEO) COMM link (COMLNK) evaluation. Continued Optical Environment Support to SBIRS Program.
- Upgraded System Planning Intercept Evaluation Tool-DTRA (SPIET-D) version to include trapped radiation and High-altitude EMP (HEMP) effects.
- Supported National Missile Defense (NMD) analyses and development of System Requirement Document (SRD) and system operation in nuclear environments.
- Updated Advanced Systems Survivability Integrated Simulation Tool Set (ASSIST) PC shell for phenomenology codes.
- Developed advanced versions of COMLNK, Radio Wave Propagation in a Structured Ionized Medium (PRPSIM) & Performance Simulation (PERSIM).
- Improved models for Short Wave Infrared Radiation (SWIR) optical emission predictions.
- Revised U.S.-NATO standard Radiation Transport Code to include distributed hazards.
- Upgraded a new browser-based software tool, Integrated Nuclear Computational Tools (INCA), to include Source Region EMP (SREMP) and five other new nuclear weapons effects. Completed beta testing in the first quarter of FY 1999.
- Demonstrated proof-of-concept EMP Vulnerability Number (EMP-VN) Model for long-line-connected power and telecommunications systems of the military.

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Project AF - Weapon System Operability (cont'd)

Developed simulation and modeling of EMP Targeting of WMD, using coherent pulsed power and nuclear EMP Simulator Source based on air, land, and sea mobile platforms.

Upgraded STRATCOM C4 Assessment Tool (STRATCAT) tool set for STRATCOM and for Regional Commands specific C3I assessment mission requirements.

Upgraded the SREMP target assessment and planning system (SREMP TAPS), to include new and war-planners-required weapon design parameters.

Developed 3-D simulation of new Nuclear Weapon Effects (NWE) and Asymmetric Threat via SHYPS code, using the DoD high-performance computing (HPC) capability and in collaboration with Lawrence Livermore National Laboratory (LLNL).

U.S./Allied Survivability & Operability in Nuclear/Special Weapon Environments (\$13,918K)

Initiated development of protection technologies for visible sensors for ballistic missile defense (BMD) and spacecraft applications.

Began development of system electronic controller chip to implement the Testable Hardware protocols on C4I and space-based infrared system (SBIRS) spacecraft and BMD missile/interceptors.

Initiated an assessment of the feasibility of using high-performance computing models to reduce design margins and test requirements.

Began an electronic tool kit to automate Testable Hardware protocol design capability for sensor, spacecraft, and missile interceptor developers.

Captured underground testing (UGT) thermal structural response (TSR) data for use in design and test methods.

Initiated the development of a survivability assessment tool to evaluate multiple element architectures to nuclear effects.

Began incorporation of a nuclear weapons effects module/database into warfighter Electronic Battlebook for assessments of the Integrated Tactical Warning and Attack Assessment (ITW/AA) by USSPACECOM and USSTRATCOM.

Successfully conducted two non-ideal airblast experiments to measure damage to heavy armored vehicles to support JCS updates to the Joint Nuclear Targeting Manual.

Completed development and assessment of low-level radiation standards and fly-away dosimetry system for NATO.

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Project AF - Weapon System Operability (cont'd)

Continued development and evaluation of low-level radiological instrumentation support for warfighters/peacekeepers operating in post-Cold-War settings (i.e., <70 rem scenarios).

Completed HEMP test of Mobile Consolidated Command Center (MCCC).

Continued application of innovative, low-cost EMP/HPM hardening technology and proposed candidate electromagnetic standards and guidelines in accordance with the new technology.

Continued assessment and testing of critical, fixed-ground-based and mobile C4I facilities.

Radiation-Hardened Microelectronics, Materials, and Photonics (\$16,521K)

Demonstrated, tested and evaluated a radiation-hardened, low-power 400K gate array for U.S. Air Force.

Demonstrated low-power/high-speed, radiation-hardened (RH) 4M static random access memory (SRAM) prototype.

Demonstrated, tested and evaluated radiation-hardened, 16M SRAM integrated circuit technology (e.g., ≤ 0.25 micron critical feature size) for USAF and the Ballistic Missile Defense Organization (BMDO).

Demonstrated, tested and evaluated a radiation-hardened, 1M, non-volatile memory using Giant Magneto Resistive (GMR) material for USAF and BMDO.

Investigated and characterized single event effects in photonic devices and deep-submicron microelectronics for USAF and BMDO.

Demonstrated radiation-hardened digital Electronic Design Automation (EDA) System for USAF and BMDO.

Small Business Innovative Research (SBIR) (\$2,081K)

Supported the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Executed Agency-approved SBIRs.

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Project AF - Weapon System Operability (cont'd)

FY 2000 Plans

Nuclear Weapons Effects Phenomenology (\$13,986K)

Support NMD analyses and development and system operation in nuclear environments.

Improve cell resolution for optical emission predictions.

Update early time Magnetohydrodynamic (MHD) Extended to Global Scale (MEGS) version for

Collisionless MHD (CMHD) and Magnetic Containment Regime (MCR) replacement.

Support SBIRS and NMD system analysis and operational development.

Replicate STRATCAT tool set in non-DoD Emergency Operations Centers.

Implement STRATCAT: V.3 on STRATCOM TS LAN and Global Command and Control System (GCCS).

Update HEMP and SREMP Vulnerability Number (VN) model for long-line coupled targets (power & telecom systems).

Implement HEMP and SREMP TAPS for DIA-specified potential threat weapons.

Integrate nuclear computational tools (INCA) to run ten lethality models covered by all of the nuclear effects covered in INCA.

Upgrade EMP-VN Model for specific WMD Targets.

Upgrade and transfer SREMP TAPS smart system for WMD Target Planning.

Develop end-to-end targeting models of WMD for the simulated nuclear EMP stress on targets via the new initiative.

Complete the development of STRATCAT tool and transfer the tool to CINC Commands.

Develop Shock Acceleration Model for nuclear burst pumped Radiation Belts.

U.S./Allied Survivability & Operability in Nuclear/Special Weapon Environments (\$13,754K)

Characterize the response of visible sensor technologies to nuclear weapons radiation environments.

Complete the development of a systems electronic controller chip to implement the testable hardware protocols on Air Force space systems and BMD missile/interceptors.

Complete feasibility assessment of high-performance computing models to reduce design margins and test requirements.

Project AF - Weapon System Operability (cont'd)

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Project AF - Weapon System Operability (cont'd)

- Deliver to program offices and government contractors an electronic tool kit to automate testable hardware protocol design capability for sensors, spacecraft, and missile/interceptors.
- Deliver TSR design and test methods for use in the design of survivable sensors, missiles, interceptors and reentry vehicles/bodies.
- Initiate assessment of the performance of BMD Family of Systems (FoS) in nuclear-disturbed environments.
- Deliver a prototype nuclear weapons effects module/database for the Warfighter Electronic Battlebook for assessments of the ITW/AA by USSPACECOM and USSTRATCOM.
- Conduct two non-ideal airblast experiments to measure damage to medium armored vehicles to support JCS updates to the Joint Nuclear Targeting Manual.
- Demonstrate integrated EMP/HPM test methods, techniques, and technologies that produce improvements over existing electromagnetic protection methodologies.
- Continue assessment and testing of critical national security assets.
- Characterize the response of advanced detector technologies to radiation.
- Upgrade non-upsettable processor controller for circumvention and recovery (C&R) for testable hardware protocol implementation.
- Complete the development of TSR test methodology for application to weapon systems operating in nuclear environments.
- Begin development of Airborne Nuclear Survey system with Army using existing Army Radiation Detection Indication and Computation (RADIACs).
- Begin development of internal and biodosimetry functions of fly-away dosimetry lab.
- Field-test and evaluate fly-away dosimetry system in scheduled nuclear weapons exercises.
- Assess NMD/TMD nuclear survivability testing and validation plans.
- Continue development and evaluation of radiation protection standards and risk measures applicable to equipment for NATO review.
- Initiate conceptual development of battlefield radiological measurement system adapted to unmanned aerial vehicle (UAV) platform.

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Project AF - Weapons System Operability (cont'd)

Begin integration of Smart Building (SB) infrastructure and event data into FBI GIS-based tools.

Complete SB assessments and Verification and Validation (V&V) of potential WMD scenarios and impacts.

Begin SB assessment of the counter WMD integrity of the as-built JOC.

Complete SB implementation and testing of approved WMD mitigation strategies, CBR filtration, sensors, flow test, structural/window/heating, ventilation, and air conditioning system retrofit(s).

Establish a SB operational counter-WMD cell within JOC for on-site and reach-back technical support and provide training as appropriate.

Radiation-Hardened (RH) Microelectronics, Materials, and Photonics (\$15,994K)

Demonstrate qualified RH 4M SRAM for USAF and BMDO.

Demonstrate prototype 1M non-volatile memory technology.

Demonstrate RH deep submicron (0.25 micron) technology for very-low-power, ultra-large-scale integrated circuits (ULSIC), e.g., 4M gate array, etc., for USAF and BMDO.

Test and evaluate photonics signal processing technology for USAF.

Publish sampling and identification of radiological agents standards.

Field a web-based version of consequence assessment tools for rapid assessment and initial detection teams.

Demonstrate RH star tracker/visible imager.

Small Business Innovative Research (\$716K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

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Project AG—Scientific Computations & Information Systems. This project provides High Performance Computing (HPC), computational databases, and information products that enable the Agency's researchers to answer questions about Weapons of Mass Destruction (WMD) effects. Models, codes, and information products are developed to aid the design of experiments, predict types and levels of measurements required, establish system design requirements, assess performance, and provide system-specific predictions of weapons effects to DoD planners. Nuclear issues often require use of advanced computational resources, i.e., for investigation of the physics of weapon-target interactions, and for extrapolating test results into areas for which tests are no longer possible. This effort requires world-class high performance computing architecture with high bandwidth communications. This capability, currently with a hub at Los Alamos National Laboratory, is scheduled to transition to the new DOE and DoD HPC architecture over the FYDP. The Data Archival and Retrieval Enhancement (DARE) information system (a digital archive and retrieval system tailored to the specific needs of the researcher, the system designer, and developer) is supported by this project. This project funds the "Graybeard" efforts for collection of unique and potentially perishable nuclear data with appropriate prioritization based on technical value. The principal thrusts respond to warfighter requirements for survivable systems and effective weapons in the Joint Warfighting Technology Areas of Discriminate Attack, Global Reach, and Counterproliferation.

FY 1999 Accomplishments

Scientific Computing (\$8,259K)

- Continued computer operations support by providing centralized CRAY resources to researchers, Agency customers and RDT&E contractors.
- Continued DATACOM computational support by providing wide area connections.
- Continued computational support by providing annual support for the Scientific Computing Communications Network and by acquisition and upgrade of HPC equipment for the Data Center.
- Provided annual support for existing DTRA owned computing equipment located at Los Alamos National Laboratory and resources located at the Data Center.
- Provided increased processor speed and disk I/O for Data Center HPC equipment.

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Project AG—Scientific Computations & Information Systems (cont'd)

Provided classified access capabilities.

Monitored and assessed circuit utilization and investigated new communication technologies.

Graybeard Project (\$4,152K)

Continued Graybeard review, commentary and archival of perishable nuclear electronics/environmental test data, shock physics, for thermomechanical and biological effects data. Initiated Graybeard data capture of nuclear sources.

Continued review, commentary and archival of cratering, ejecta, dust and fallout test, nuclear effects test data for thin film, biological effects and transient radiation effects on electronics.

Accelerated Graybeard document review activities on ionization and electromagnetic (EM) effects.

Completed Graybeard free field airblast data commentary.

Continued incorporation of atmospheric and underground nuclear test data.

DASIAC (Information Analysis Center) (\$3,158K)

Provided scientific and technical information services and products as the DoD-wide repository for test photos, films, data, test records and other information products, through operation of the Information Analysis Center.

Continued operation of web site, providing radiation response of electronic parts.

Disseminated Science and Technology Digest.

Application of Nuclear Weapons Expertise (\$719K)

Drafted update of The Effects of Nuclear Weapons.

Reviewed draft Nuclear Weapon Effects textbook; continued drafting remaining chapters.

Completed and distributed Nuclear Effects Data Management and Analysis Systems and installed it on DARE and at UK's Atomic Weapons Establishment (AWE).

Completed validation of Advanced Numerical Methods. Compared results to precision test data.

Developed a 3D atmospheric code with column physics based on the Automatic Mesh Refinement (AMR) code.

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Project AG—Scientific Computations & Information Systems (cont'd)

DARE (\$4,679K)

Began preparation of DARE guide to blast effects on structures.
Expanded archival of information and knowledge of nuclear weapons and other WMD and Agency mission areas for retrieval in DARE as outlined in DARE Master Plan.
Developed and tested computational tools and system enhancements, which provide greater search, retrieval, storage and analysis capability to the DARE customer.
Initiated development of video/text interrelationship with hyperlink and other innovative knowledge enhancement and preservation tools.
Continued legacy document population.

FY 2000 Plans

Scientific Computing (\$7,118K)

Provide computational support for the Scientific Computing Communications Network; upgrade HPC equipment for the Data Center and enhance access to scalable DoD HPC Modernization Program (HPCMP) Systems and ensure DOE Accelerated Strategic Computing Initiative (ACSI) program.
Provide sustainment and enhancement of classified access capabilities to the Scientific Computing Resources.
Provide monitoring and assessment of circuit utilization and investigation of emerging communication technologies to support remote visualization and analysis of full physics, full fidelity, 3-dimensional calculations.
Generate precision data to verify and validate AMR.

Graybeard Project (\$5,667K)

Complete Graybeard work on High Altitude Nuclear Effects.
Continue review, commentary and archival of perishable nuclear electronics environmental test data, shock physics, test data, thermomechanical, biological and nuclear sources effects data.
Continue data review, commentary and archival of transient radiation effects on electronics, cratering, ejecta, dust and fallout, thin-film optics.

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Project AG—Scientific Computations & Information Systems (cont'd)

DASIAC (Information Analysis Center) (\$4,876K)

Provide scientific and technical information services and products as the DoD-wide repository for test photos, films, data, test records, and other information products. Publish and distribute Nuclear Weapons Effects textbook.

Application of Nuclear Weapons Expertise (\$719K)

Continue to supply authoritative data and provide requested analysis of the effects of nuclear weapons testing, and other DTRA mission areas.
Continue efforts to ensure that Nuclear Weapons Effects test data and results are preserved as DoD downsizes and laboratories with nuclear test data close.
Validate the AMR code, using field atmospheric data.

DARE (\$6,269K)

Continue to expand archival of information and knowledge of nuclear weapons and other Weapons of Mass Destruction (WMD) and Agency mission areas for retrieval in DARE as outlined in DARE Master Plan.
Continue to develop and test computational tools and system enhancements, which provide greater search, retrieval, storage, and analysis capability to the DARE customer.
Continue development of video/text interrelationship with hyperlink and other innovative knowledge enhancement and preservation tools.
Continue legacy document population.
Begin entry of nuclear simulation data.
Enhance data visualization tools.
Expand online access to DARE classified and unclassified resources.
Integrate automated test data recorder interface into DARE archive.

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Project AI - Hard Target/Tunnel Defeat & Nevada Test Site (NTS) Sustainment - The United States and its allies face a growing threat related to critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes which house battle management facilities, command, control, and communications facilities, theater ballistic missiles and their transporter-erector-launchers (TELs), and biological/chemical/ nuclear weapons production or storage facilities. An objective of this program is to examine the existing U.S. and Allied capabilities to hold hardened, deeply buried tunnel targets at risk, thereby defining a current performance baseline. Any deficiencies will be identified and the ability of planned systems to address these deficiencies will be assessed. Finally, new technologies needed to mitigate remaining shortfalls will be evaluated as candidates for new hard target defeat acquisitions. Activities respond to priorities by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)), Hard and Deeply Buried Target Defeat Capability Initiative and warfighting CINCs. Efforts in this program provide part of the technology base needed for counterproliferation activities conducted in other DoD programs.

The Presidential Decision Directive (PDD) on Stockpile Stewardship implemented an indefinite moratorium on underground nuclear testing while requiring retention of the capability to resume testing at Presidential direction. DoD has complied with this policy by realigning the previously existing underground test program to emphasize non-nuclear weapons test technology and facility development, and to conduct a program for an orderly decommissioning and mothballing of the national underground nuclear test assets. The following major tasks will satisfy this requirement: (1) continue test complex shutdown, and tunnel stabilization and preservation; (2) continue environmental characterization; (3) document testbed design and construction methodology; (4) maintain underground test readiness through joint test organization activities at NTS including counterproliferation and hard target defeat testing; and (5) support SOCOM efforts to develop tactics and techniques for JCS Joint Warfighter Capabilities of Discriminate Attack and Counterproliferation. Project AI is linked to Project AB, through which its testing is conducted, and to Project AC which leverages its weapons work.

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Project AI - Hard Target/Tunnel Defeat & Nevada Test Site (NTS) Sustainment (cont'd)
FY 1999 Accomplishments

Functional Defeat Characterization (\$1,911K)

Continued development and validation of remote site geologic characterization technology.

Initiated functional characterization and modeling of tunnel facilities.

Defeat Technology (\$6,281K)

Continued to evaluate weapon/target interactions for new weapon concepts, enhanced payloads, and target fragility.

Initiated penetration testing on other tunnel geologies.

Conducted weapon/payload testing to identify/quantify defeat mechanisms and evaluate effectiveness.

Developed improved new weapon/target interaction models to include penetration, portal damage, in-tunnel airblast and fragments, in-tunnel equipment response, and reconstitution.

Continued support for USD(A&T)'s Hard Target Defeat Capability program.

Began readiness testing of live weapons at NTS in preparation for tunnel defeat demonstrations.

Completed construction and outfitting of the full-scale tunnel facility and initiate demonstrations.

Initiated planning for and construction of a second tunnel facility representing a different target function.

Planning Tool Development (\$1,000K)

Continued automated weaponeering tool development by enhancing the Munitions Effects Assessment (MEA) tunnel module for structural and functional damage and battle damage assessment.

Initiated development of new planning tools to improve deliberate planning capabilities for hard target defeat.

NTS Sustainment (\$1,702K)

Maintained Agency activities at NTS in support of environmental remediation efforts.

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Project AI - Hard Target/Tunnel Defeat & Nevada Test Site (NTS) Sustainment (cont'd)

Provided on-site personnel to plan and supervise environmental remediation of Agency facilities.
Maintained one tunnel complex.

FY 2000 Plans

Functional Defeat Characterization (\$2,100K)

Continue development and validation of remote site geologic characterization technology.
Conduct geologic material properties tests for tunnel defeat demonstration facility.
Continue functional characterization and modeling of tunnel facilities.
Identify mission critical equipment and vulnerabilities for functions modeled in second tunnel facility.
Evaluate signatures for hard target defeat applications.

Defeat Technology (\$6,382K)

Continue to evaluate weapon/target interactions for new weapon concepts, enhanced payloads, and target fragility.
Continue penetration testing on other tunnel geologies.
Continue weapon/payload testing to identify/quantify defeat mechanisms and evaluate effectiveness for other tunnel functions.
Develop improved new weapon/target interaction models to include in-tunnel equipment response, and reconstitution for different tunnel functions.
Continue support for DoD and military service hard target defeat-related activities.
Complete readiness testing of live weapons at NTS in preparation for the first series of tunnel defeat demonstrations.
Conduct functional defeat demonstrations on the full-scale tunnel facility.
Complete planning for construction of a second tunnel facility representing a different target function.

Planning Tool Development (\$950K)

Continue automated weaponeering tool development by enhancing the MEA tunnel module for structural and functional damage and battle damage assessment for different tunnel functions.

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Project AI - Hard Target/Tunnel Defeat & Nevada Test Site (NTS) Sustainment (cont'd)

Continue development of new planning tools to improve operations planning capabilities for hard target defeat.

NTS Sustainment (\$1,100K)

Maintain Agency activities at NTS in support of environmental remediation efforts.

Provide on-site personnel to plan and supervise environmental remediation of Agency facilities.

Maintain one tunnel complex.

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Project AN - Thermionics - Meeting national objectives in both the military and civilian areas will require large capacity (40-100kW) nuclear space power systems having long lifetimes. Potential applications have been identified by the Air Force and NASA. The Air Force "New World Vistas" study, dated 15 December 1995, cites specific requirements for space nuclear power to accomplish force projection from space. NASA has identified requirements for power and propulsion for contemplated deep space missions and manned exploration. The objectives of the Advanced Thermionics Program are to advance the state of the art of thermionic power conversion in the United States, to develop high performance and highly reliable thermionic converters that provide high output power per unit of system mass, to demonstrate the capabilities of these thermionic converters, to show their feasibility for use in thermionic systems, and to develop corresponding system level conceptual designs. This effort supports the Defense Technology Area Plan for Space Platforms.

FY 1999 Accomplishments

In-core thermionic development (\$1,800K)

Continued work on test of high-performance and high-reliability converters for in-core thermionic fuel elements. Awarded a contract for development of close-spaced multi-cell converter module.

Microminiature Thermionic Converters (MTCs) (\$1,200K)

Continued to apply trial tricarbonate coatings on the emitter portion of the converters, and continued work on scandate coatings.

FY 2000 Plans

In-core thermionic development (\$2,000K)

Continue work on development of close-spaced multi-cell converter module. Continue development of appropriate solar power for thermionic applications. Award a contract for follow-on development of multi-cell converter module.

Microminiature Thermionic Converters (MTCs) (\$916K)

Complete testing of tricarbonate coatings on the emitter portion of the converters, and continue work on scandate coatings.

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Project AQ - Deep Digger - This project proposes to develop a "Deep Digger" design for attacking hard targets such as leadership or C3 Bunkers, underground factories, or weapon storage facilities. The U.S. Services have identified a need to defeat such hard and buried targets. Current weapons have only limited capability against these targets. A more effective penetrator capability such as that claimed by the inventor of "Deep Digger" is required.

This effort is responsive to U.S. Special Operations Command interests as well as the consolidated Mission Need Statement of the U.S. Air Force Combat Command and the U.S. Strategic Command. The "Deep Digger" system would be delivered by a guided munitions airframe such as used by the Air Force and the Navy. As an integrated weapon, this concept has application as a breaching tool.

FY 1999 Accomplishments (\$2,000K)

- Demonstrated the ability of the Deep Digger concept to explosively fracture rock and remove the resulting muck with statically placed high explosive charges.
- Developed and demonstrated a unique augmented penetration projectile device to be used, with great advantage, in the Phase II, Deep Digger.
- Finalized development of Deep Digger projectile.
- Considered energy constraints and developed most efficient gas generator for projectile.

FY 2000 Plans (\$3,888K)

- Develop and demonstrate a Special Operations Forces (SOF) projectile that can be fired from a near standard 1" gun (or 25mm gun) for defeating concrete blast doors and other hardened concrete walls.
- Evaluate and select the best rapid firing methodology/gun for use in Deep Digger concept.
- Initiate development of a true fieldable prototype of Deep Digger.

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Project BB - Small Business Innovative Research (SBIR) - This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported research and development results. These efforts are responsive to PL 102-564.

FY 2001 Plans

Small Business Innovative Research (\$4,750K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

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Project BC - Force Protection and Technology Applications - This project supports Assessment and Mitigation Technologies, which conducts mission vulnerability assessments of strategic U.S./Allied systems to facilitate the development of investment strategies for improved survivability, to include nuclear command and control. This program also ensures that assessment training programs, engineering designs, and new construction embody sound force protection, vulnerability mitigation, and collective protection principles. DTRA technologies and expertise are applied to enhance U.S. capabilities across the spectrum of the counterproliferation and force protection missions. These may include development of sensor technologies for initially identifying the consequences of WMD through countering or protection against this threat. Some of the program's products and services include the Balanced Survivability Assessments (BSA), the Smart Building (see Project AF) program's strategic facility construction design and cost estimates, vulnerability out-briefs and written reports, overall vulnerability trend data, National and NATO conferences for Underground Facility Managers, and multi-disciplined technical engineering expertise support.

FY 2001 Plans -

Balanced Survivability Assessments (\$5,948K)

- Conduct balanced survivability and integrated vulnerability assessments on DoD facilities as tasked by CINCs, the Joint Staff, and OSD.
- Continue integrated vulnerability assessment of defense and critical national infrastructure facilities.
- Initiate a vulnerability mitigation technology development program.

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Project BC - Force Protection and Technology Applications (cont'd)

Smart Building Program (\$5,037K)

- Continue integration of infrastructure and event data into Department of Justice (DoJ)-based tools.
- Complete assessments and Verification and Validation (V&V) of potential WMD scenarios and impacts.
- Complete implementation and testing of approved WMD mitigation strategies, chemical/biological/radiological (CBR) filtration, sensors, flow test, structural/window/heating, ventilation, and air conditioning (HVAC) system retrofit(s).
- Complete an operational counter-WMD cell within Joint Operations Center (JOC) for on-site and reach-back technical support, and provide training as appropriate.
- Complete assessment the counter WMD integrity of the as-built JOC.

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Project BD - Weapons Effects Technologies - This project provides for the development and application of products and services to meet WMD and other special weapons effects challenges. This is accomplished using state-of-the-art science and engineering capabilities, including advanced first principles analysis, engineering modeling, simulation and networking technologies, and precision laboratory scale and field testing capabilities (supported by Project BE). The project integrates and applies these advanced capabilities to support decision making in the face of rapidly evolving WMD threats in both military and civilian sectors. Products being developed include WMD target planning and assessment tools, WMD hazardous materials transport and collateral effects prediction tools, tools and technologies used to mitigate the effects of WMD on facilities and people, and consequence assessment tools to evaluate and respond to WMD events. Additionally, this project develops the enabling technologies used to produce anti-terrorist/force protection tools. This project also develops technologies to support Force Protection assessments and forensic analysis of terrorist events as well as advanced blast mitigation/retrofit techniques. Such tools developed on this project are used to enable other projects including BC, and BF. Also, they are made available to civilian, counter-terrorism and disaster response support organizations.

This project also maintains the capability to address nuclear weapons effects problems. This involves development and application of state-of-the-art nuclear weapons effects models to DoD problems, thereby providing effective stewardship for the nation's nuclear weapons effects knowledge, technologies, and capabilities. In addition, the project maintains a national archive of nuclear phenomenology, involving perishable nuclear test data and expert interpretation, weapons effects models that encode our knowledge base, and a modern computer-based architecture for retention and access to such archives. These capabilities are used in direct support of the warfighter and are used to enable other projects including BG and BH.

In direct support of these products and services to the warfighter, this project also provides and maintains a world-class High Performance Computing (HPC) architecture with high band-width communications required for direct support to the warfighter. This service enables the application of state-of-the-art first principles models to WMD

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Project BD - Weapons Effects Technologies (cont'd)
 problems and supports the development of improved models and migration to advanced computing architectures.

FY 2001 Plans

Structural Response and Mitigation Technology (\$13,353K)

Complete precision tests for validating Lethality/Vulnerability (L/V) models that are used in the Integrated Munitions Effects Assessment (IMEA).

Complete tests on Former German Democratic Republic C3I equipment and develop functional defeat model.

Conduct precision tests on conventionally constructed-unhardened reinforced concrete and masonry walls, steel deck slabs and develop engineering level models for MEA.

Develop multiple shot wall damage algorithms for MEA 5.0.

Complete V&V guidelines for computational mechanics codes.

Integrate, test and evaluate models L/V models in IMEA 5.0. Perform component and system level tests to assure compliance with joint targeting/munitions effects validation and verification criterion.

Integrate the initial set of weaponeering tools into the initial Integrated Target Planning Tool-set (ITPTS 1.0).

Perform component and system level tests to assure integration of the first six-weaponeering tools into ITPTS 1.0. Assure compatibility with the Defense Intelligence Agency data space ATHENA and the JCS/J2T Joint Targeting ToolBox.

Scientific Computing (\$16,102K)

Complete Graybeard nuclear test data review, commentary and archival on airblast, cratering & ejecta, and dust & fallout, electronics interaction, and biological effects.

Provide scientific and technical information services and products as the DOD-wide repository for test photos, films, data, test records, and other information products.

Continue review, commentary and archival of perishable nuclear environmental radiation, thermo-mechanical, and electromagnetic test data.

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Project BD - Weapons Effects Technologies (cont'd)

Continue Computational support by providing annual support for the Scientific Computing Communications Network and maintain HPC equipment for the Data Center, such as increased memory and additional CPU's to extend the life of existing systems and enable them to accommodate additional workload from decommissioning of older vector machines.

Provide classified access capabilities for the Data Center. Deploy new communications technologies to support remote visualization and analysis of full physics, full fidelity, 3-dimensional calculations.

Collateral Effects (\$16,977K)

Complete development of high-resolution probabilistic weather capability necessary for target planning of WMD facilities to support the warfighter.

Develop short- and long-term human casualty models to support CINC requirements.

Complete industrial hazardous material source term modeling for Hazard Prediction and Assessment Capability (HPAC).

Evaluate urban modeling capability at 2001 Presidential Inauguration using the HPAC.

Provide counter-terrorism planning and urban transport and dispersion modeling capability for joint DoD/DOE support of Salt Lake City Winter Olympics.

Complete collaboration of DOE and DoD anti-terrorism hazard prediction capability verification and validation effort.

Advanced Weapons Effects Phenomenology (\$14,296K)

Support National Missile Defense/Theater Missile Defense with detailed nuclear phenomenology and analysis to aid in the development of models of system operation in nuclear environments

Complete non-ideal airblast phenomenology update in direct response to request of U.S. Army.

Complete development of the EMP (Electromagnetic Pulse) targeting models for Strategic Command (STRATCOM).

Complete development of the STRATCOM C4 Assessment Tool set (STRATCAT) and transfer the final version of the tool to STRATCOM.

Install STRATCAT in non-DoD emergency operating centers.

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Project BD - Weapons Effects Technologies (cont'd)

- Complete upgrade of fallout casualty assessment tools with incorporation of scavenging.
- Complete detailed first principle upgrade of EMP tools to include Source Region EMP (SREMP) Tool sets.
- Complete detailed benchmark calculations of delivery system impact on nuclear weapon output spectrum.
- Initiate upgrade of high/low altitude nuclear environment to assess nuclear effects on military system design.
- Complete all cratering and ground shock work.

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Project BE - Testing Technologies and Integration - This project provides a unique national test-bed capability for Weapons of Mass Destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat for various types of test/demonstration functions to support acquisition managers, weapon effects researchers, and counterproliferation (CP) and non-proliferation programs. The project develops, provides and maintains unique national test-beds used by the DoD, the Services and other federal agencies to evaluate the impact of hostile environments from WMD, conventional, nuclear, and other special weapons on military or civilian systems and targets. This project leverages fifty years of testing expertise to investigate weapons effects and target response to a spectrum of hostile environments that could be created by proliferant nations or terrorist organizations with access to advanced conventional weapons or WMD (nuclear, biological and chemical). Specific programs supported by this project include: (1) Hard Target Defeat (HTD); (2) Anti-terrorism (AT); (3) CP Counterforce Advanced Concept Technology Demonstration (ACTD); (4) Special Operations Forces (SOF); and (5) Nuclear Facility Defeat Program. This program maintains testing infrastructure to support warfighters, other government agencies, and friendly foreign countries testing requirements on a cost reimbursable basis. This project also develops strategy and planning for a national WMD test-bed infrastructure focusing on nuclear, biological, and chemical facilities; and the hard and deeply buried facilities in which activities are often located. The project provides infrastructure support for full and sub-scale tests that focus on weapon-target interaction with fixed soft and hardened facilities to include aboveground facilities, cut-and-cover facilities and deep underground tunnels. Specific activities include testbed design and construction, instrumentation and data collection, test coordination and execution, and post-test analysis and documentation. This project directly supports Projects BC, BD, and BF, and PE 0603160BR, Project BK.

FY 2001 Plans

Test-Bed Operation and Support (\$8,821K)

Continue to provide unique national test-bed capabilities for weapon-target interaction and WMD programs. Provide an inventory of unique targets, infrastructure support, and

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Project BE - Testing Technologies and Integration (cont'd)

expertise for conduct of major integrated test programs, including instrumentation maintenance, gauge installation, data recording, source diagnostics, environmental support, safety support, experiment installation, experiment fielding, and test fielding.

Field Support (\$769K)

Continue to provide infrastructure support for maintenance of government vehicles, transportation of equipment, communications, utilities for facilities, rental of facilities, supplies, custodial service, and procurement of equipment in support of test execution.

Nevada Test Site (NTS) Environmental Remediation (\$842K)

Continue systematic environmental assessment and remediation on the tunnel complexes at NTS for which DTRA is responsible.

Develop Corrective Action Plan for N-tunnel muck pile and Corrective Decision Document for T-tunnel muck pile.

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Project BF - CP Operational Warfighter Support - This project will provide targeting and Intelligence Community (IC) support, introduce customers to CP technologies and products, develop DoD compliant simulations that exploit CP models for target planning and collateral effects prediction, and demonstrate selected mature CP capabilities in an operationally realistic environment. The current focus for technology demonstrations is on the defeat of hard targets and nuclear related facilities. The technical approach is to integrate technologies developed in other CP projects, to conduct a full spectrum of tests to verify capability enhancement, to expose customers to these capabilities in exercises, wargames and demonstrations, to institutionalize CP technologies into customer operations, and to support customer use of these capabilities during contingency operations. This approach is based on four thrusts that support outside customer requirements. The four thrusts are Targeting and IC Support, a Weapons of Mass Destruction (WMD) Assessment and Analysis Center (WMDAAC), a Hard Target Defeat (HTD) program, and a Nuclear Facility Defeat program. When complete, the CP Operational Warfighter Support project will provide the bridge between the CP technology base and operational community needs. The overall project goal is to support the JCS, the warfighting commanders-in-chief (CINCs) and Services/agencies engaged in countering WMD threats and to protect the U.S. and its allies against military or terrorist use of WMD. Access is provided to technical databases, software models and tools, and subject-matter experts to support warfighting CINCs and other DoD agencies, federal, state, and local governments, and civilian agencies in their CP mission.

Targeting and IC Support. Targeting and IC Support provides functional vulnerability assessments of hostile foreign systems in support of warfighter and IC requirements. It assists the CINCs and IC in target planning against hard and deeply buried facilities. The assessments leverage databases, methodologies, and technical expertise developed during Balanced Survivability Assessments (Project BC). Details of specific individual assessments are classified.

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Project BF - CP Operational Warfighter Support (cont'd)

WMD Assessment and Analysis Center. The WMDAAC provides both an operational resource for information and analysis and a research and development facility to improve U.S. capabilities to defend against WMD threats and to mitigate consequences of nuclear, chemical, and biological weapons use or release of hazardous materials. It provides DoD and non-DoD customers with a centralized, comprehensive resource for WMD information and analysis. The WMDAAC objectives are to: (1) provide warfighters and first responders with ready access to mature computer models, computer databases, and expert information on WMD effects and countermeasures using reliable and proven operational equipment assets and communications networks; (2) operate a research and development facility for maturing and testing leading edge software, i.e., weapon effects models and next generation communications schemes; (3) ensure maximum utility of DTRA models in distributed interactive simulations through compliance with High Level Architecture (HLA) standards and protocols; (4) improve warfighter ability to counter WMD through field assistance, training, and information resources; and (5) provide a Modeling and Simulation Center of Expertise for DTRA program managers.

This project provides research and development of advanced simulations, to implement hardware and supply services for WMDAAC next generation communications connectivity to the user community, and to make technical support available to customers. Advanced simulations are developed from first-principles physics models produced in other CP projects (extensively Project BD). Daily center operation is supported from DTRA operation and maintenance funds.

Hard Target Defeat Program. The United States and its allies face a growing threat related to critical military targets hidden within and shielded by hardened, deeply buried tunnel complexes. These complexes may house biological/chemical/nuclear weapons production or storage facilities; battle management facilities; command, control, and communications facilities; and theater ballistic missiles and their transporter-erector-launchers (TELs). An objective of this project is to examine the existing U.S. and Allied capabilities to hold hardened, deeply buried tunnel targets at risk, thereby defining a current performance baseline.

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Project BF - CP Operational Warfighter Support (cont'd)

Any deficiencies will be identified and the ability of planned systems to address these deficiencies will be assessed. Finally, new technologies needed to mitigate remaining shortfalls will be evaluated as candidates for new hard target defeat acquisitions. Activities respond to priorities by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(A,T&L)), Hard and Deeply Buried Target Defeat Capability Initiative and warfighting CINCs. This project focuses weapon/target interaction and target planning tool technology base efforts completed in Project BD on tunnel applications. The program depends on test planning and execution support from Project BE. Products from this project are transitioned to PE 0603160BR, Project BK for C3I facility demonstration. Efforts in this program provide part of the technology base needed for counterproliferation activities conducted in other DoD programs.

Nuclear Facility Defeat Program. Nuclear Facility Defeat (NFD) will provide the National Command Authority (NCA) and combatant commands means to deny critical nuclear production, processing, fabrication and storage capability of an adversary, without the prohibitive political consequences of large radiation releases downwind of the target. Once the intelligence community determines the adversary's nuclear production cycle, critical facilities can be targeted to eliminate overall capability. NFD provides methods to functionally kill selected facilities, predict and minimize resulting collateral effects. Additionally, this program will enhance our ability to predict the consequences of terrorist action against nuclear facilities. This program focuses weapon/target interaction, target planning tool, and hazard prediction tool technology base efforts completed in Project BD on nuclear facility applications. The program depends on test planning and execution support from Project BE. This program will transition to PE 0603160BR, Project BK starting in FY03 for operational demonstration.

FY 2001 Plans

Targeting and IC Support (\$1,899K)

Continue assessments of hostile facilities based on JCS and CINC priorities. Details are classified.

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Project BF - CP Operational Warfighter Support (cont'd)

WMD Assessment and Analysis Center (\$11,771K)

Design and implement redundant, fault-tolerant WMDAAC architecture to meet mission requirements and insure sustained operations during a WMD threat or incident.

Augment security measures to neutralize evolving cyber intrusion risks.

Acquire and install multi-tasking application server, new domain name servers, and firewall modules to increase capabilities and augment rapid-retrieval mass data storage.

Provide supplemental power sources for assured continuity of operations.

Provide high-speed data connectivity for operational and research and development customers using Defense Information Systems Network-Leading Edge Services (DISN-LES) advanced communication connectivity for web-based data handling and wide-band satellite communications for multiple remote users and deployed teams.

Continue technical and advanced modeling and simulation support to CINC sponsored exercises worldwide and consequence analysis support for exercises and wargames.

Continue implementation of the Analysis and Assessments program to provide real-time support to Services through enhanced infrastructure, deployment teams, integrated models, and technical support.

Continue to update and refine support database per CINCs, Services, and Joint Staff guidance and to develop WMD consequence analysis capabilities.

Maintain permanent (virtual) presence at the Joint Warfare Systems (JWARS) and Joint Simulation Systems (JSIMS), supporting WMD modeling within these critical programs.

Hard Target Defeat Demonstrations (\$10,627K)

Continue fielding support and damage repair for functional defeat demonstrations on the full-scale tunnel facility at Nevada Test Site (NTS).

Conduct test planning, instrumentation and data analysis for functional defeat demonstrations.

Provide and install critical equipment necessary for functional defeat demonstrations on a second tunnel facility representing a different target function i.e., command, control, communication and intelligence for weapons of mass destruction (C³I/WMD).

Conduct simulated tunnel facility operations to support signature/sensor evaluations.

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Project BF - CP Operational Warfighter Support (cont'd)

Continue construction of a second tunnel facility representing a different target function (C³I/WMD) to be used for functional defeat demonstrations.
 Conduct functional defeat demonstrations on the full-scale tunnel facilities.
 Conduct experiments to determine reconstitution time after a functional defeat attack.
 Continue to construct/repair hard targets to support other test requirements.
 Continue planning and calculations for a large high explosive tunnel facility test.

Hard Target Defeat Technology (\$11,142K)

Continue development and validation of remote site geologic characterization technology.
 Conduct geologic material properties tests for tunnel defeat demonstration facility.
 Continue functional characterization and modeling of tunnel facilities.
 Identify mission critical equipment and vulnerabilities for functions modeled in the second tunnel facility.
 Continue penetration testing on other tunnel geologies to include multiple attacks on the same aimpoint.
 Continue weapon/payload testing to identify/quantify defeat mechanisms and evaluate effectiveness for other tunnel functions.
 Develop improved/new weapon/target interaction models to include in-tunnel equipment response, and reconstitution for different tunnel functions.
 Continue support for other DoD and military service hard target defeat-related activities.
 Continue automated weaponeering tool development by enhancing the MEA tunnel module for structural and functional damage and battle damage assessment for different tunnel functions.
 Continue development of new planning tools to improve operations planning capabilities for hard target defeat.
 Continue evaluation of signatures for hard target defeat applications.
 Continue to evaluate weapon/target interactions for new weapon concepts, enhanced payloads, and target fragility.

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Project BF - CP Operational Warfighter Support (cont'd)

Nuclear Facility Defeat (\$4,285K)

Complete modeling of nuclear enrichment facility and initiate modeling nuclear reprocessing facilities.

Continue integration of nuclear facility modeling into the Hazard Prediction and Assessment Capability (HPAC) prediction tool.

Improve human health factor effects modeling.

Continue target planning tool development for nuclear facilities.

Initiate NFD sensor integration, concept, and feasibility study.

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Project BG - Nuclear Operations - This project encompasses programs formerly contained in Project AE (Weapon Safety and Operational Support) and Project AL (Classified Program) which transitioned from the Defense Special Weapons Agency into DTRA (Nuclear Operations, Education and Training, and Nuclear Weapons Stockpile Support). Project BG (Nuclear Operations) has reorganized these legacy activities as Nuclear Programs and CINC/Forces/Security Support and initiated a new activity--WMD (Nuclear) Protection Response. These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2010 and are directed by the JCS in the Joint Strategic Capabilities Plan (JSCP) (Nuclear Annex). Responsive to the oversight of the Nuclear Weapons Council, they provide critical support to the CINCs, Services, JCS and OSD. This new project is divided into three business areas described below: Nuclear Programs, CINC/Forces/Security Support, and WMD (Nuclear) Response Protection.

Nuclear Programs.

Safety: As tasked by the JSCP, the safety programs will provide CINCs, Services, and JCS with technical analysis, studies and research to identify and quantify risks and uncertainties of plutonium dispersal due to accidents, fires or natural causes during normal, peacetime operations of the nations nuclear weapon systems. Additionally, these studies quantify the probability of reduced safety assurance or Nuclear Detonation Safety Exceptions (NDSE) as identified by DOE Laboratories.

Nuclear Mission Management Plan (NMMP): As tasked by Deputy Secretary of Defense and Director, Defense Research and Engineering (DDR&E), and in support of national requirements to maintain a strategic nuclear deterrent, conduct assessments, develop long-range plans, and continue development of the DoD Nuclear Mission Management Plan to provide a comprehensive, integrated DoD roadmap for the continued sustainment and viability of U.S. nuclear forces, personnel, and infrastructure.

Stockpile Sustainment: Continue to act as DDR&E's Executive Agent for Annual Certification and Dual Revalidation and support related stewardship and sustainment activities.

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Project BG - Nuclear Operations (cont'd)

CINC/Forces/Security Support. As tasked by the JSCP and DoD Directives, these programs will provide CINCs, Services, JCS and DoD with focused analyses in support of nuclear planning and operations and WMD threat mitigation analyses as they pertain to the combat survivability of the forces. Additionally, they provide the DoD nuclear physical security applied research and force-on-force (FoF) testing programs.

WMD (Nuclear) Response Protection. Protecting our citizens and critical infrastructures at home is an essential element of U.S. national security strategy. Potential adversaries, whether nations, terrorist groups or criminal organizations, will be tempted to use weapons of mass destruction to match U.S. conventional weapon superiority. Promoting initiatives that allow us to detect those who would use weapons of mass destruction against us directly supports the National Military Strategy by promoting peace and stability.

FY 2001 Plans:

Nuclear Programs (\$20,239K)

Safety Program thrusts:

- Complete the B-2 Weapon Safety System Assessment (WSSA).
- Continue Storage Vault Blast Effects Testing and Analysis.
- Begin Long Term Storage WSSA.
- Analyze and quantify DOE Nuclear Detonation Safety Exceptions (NDSEs).
- Complete the C-17 Aircraft Transportation Study.
- Conduct modeling and testing to support ongoing WSSAs.
- Continue the development and population of WSSA database to archive completed WSSAs.

Stockpile Sustainment Program thrusts:

- Conduct annual certifications, at Presidential direction, of the continued safety and reliability of the U.S. nuclear stockpile in the absence of underground testing.
- Provide personnel, as tasked by Assistant to the Secretary of Defense for Nuclear, Chemical and Biological (ATSD(NCB)), for participation on the joint DoD-DOE Dual

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Project BG - Nuclear Operations (cont'd)

Revalidation teams, to conduct a multi-year, in-depth evaluation of the continued safety and reliability of specified weapons in the nuclear stockpile.

Continue evaluation of the W80 in support of the Air Force.

Prepare an annual performance report, as directed by Presidential Decision Directive (PDD), on the DoD stockpile sustainment accomplishments and future plans.

Continue development of the Virtual Underground Test program, which will utilize a combination of codes, models, simulators, and legacy test data to evaluate weapon system survivability, in support of requirements to maintain a survivable nuclear stockpile.

CINC/Forces/Security Support (\$10,313K)

Complete assessment of outyear nuclear command and control requirements for NATO/SHAPE/Allied Command Europe.

Provide maintenance of USEUCOM/SHAPE European Theater Nuclear Support Program to provide in-theater nuclear and WMD support to NATO (IS/IMS), SACEUR, SHAPE (Nuc Ops/ACOS Policy), EUCOM J-5N, and the Joint Theater Surety Management Group.

Continue support to STRATCOM and regional CINCs with specific nuclear and WMD threat analyses in support of SIOP preparation, development of integrated effects models, direct planning support to regional CINCs, and specific applications for the Deterrence Framework analytic structure.

Initiate a new forces support program examining the impact of follow-on START Agreements on nuclear planning and employment option development. Specific interest in the probable impact of advances in foreign missile defense capabilities vice smaller U.S. strategic deterrent capabilities.

Continue to directly support the curriculum development for the Defense Nuclear Weapons School.

Initiate a program to fully integrate the planning processes and target data sets of STRATCOM, regional CINC plans and NATO nuclear planning capability.

Provide a quality forum for the development of assessments of the impact of technology on the capability of the nuclear forces and plans to sustain the U.S. nuclear deterrent policy and strategy.

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Project BG - Nuclear Operations (cont'd)

Complete the WMD operational analysis for CENTCOM/USFK/TRANSCOM dealing with chemical threats to U.S./Allied military operations.

Conduct Force-on-Force exercise program focused on U.S. forces in USEUCOM/USAFE-Mighty Guardian series.

Expand the support of the AFSPACECOM/STRATCOM security analyses of ICBM forces.

WMD (Nuclear) Response Protection (\$17,000K)

Provide ability to accurately and quickly identify source of production of special nuclear material used in weapons or improvised devices.

Facilitate rapid and reliable identification of the source of shielded nuclear material (SNM) involved in a nuclear/radiological event/incident.

Develop portable, mobile, and rapidly deployable radiation detection and measurement System, a portion of which will be comprised of remote sensors linked to central receiving/processing station via RF signals.

Provide CINC Technical Support Groups (TSG) ability to employ the system based on intelligence cueing.

Develop and field passive and active SNM detection systems where capable of detection in cases where SNM is shielded; current detectors technologies do not perform well when SNM is shielded for gamma and/or neutron emissions.

Conduct applied research and development in order to enhance the capabilities of DoD to consistently defeat Improvised Nuclear Device (IND)/Radiological Dispersal Device (RDD) through the use of developed technologies, tools, and techniques.

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Project BH - System Survivability - These programs directly reflect the National Military Strategy, support the provisions of Joint Vision 2010, and are directed by the JCS in the Joint Strategic Capabilities Plan (Nuclear Annex). Current and future warfighters and weapon systems, including the associated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), missile defense and support systems/equipment, must be able to survive and operate effectively through a spectrum of hostile environments. Planned efforts emphasize the development and demonstration of innovative and cost-effective technologies to sustain the functional survivability of U.S. and Allied Forces and systems when confronted with threats from advanced conventional weapons, special weapons and limited nuclear attack. This project constitutes the DoD's resident science and technology expertise in nuclear and related survivability matters. It develops and demonstrates affordable strategies and hardening technologies for U.S. systems; transfers the technical products to acquisition program offices; conducts component, subsystem, system and end-to-end performance tests and assessments as requested by the Services and CINCs; and provides support to the Office of the Secretary of Defense on technical and policy matters that relate to the acquisition of survivable systems and strategic system sustainment.

Project BH encompasses programs formerly contained in Project AB (Test and Simulation Technology), Project AC (Weapons Systems Lethality), and Project AF (Weapon System Operability) which transitioned from the Defense Special Weapons Agency into the Defense Threat Reduction Agency. The new project is divided into the five business areas described below: Radiation Tolerant Microelectronics, Simulator Technology, Operability Assessments, Balanced Electromagnetic Hardening, and Human Survivability.

Radiation Tolerant Microelectronics. Responds to DoD space and missile system requirements for hardened microelectronics and photonics technology to support mission needs. The non-availability of this technology would adversely impact system survivability, performance, weight and cost. The program involves the development and demonstration of technology to support the fabrication of radiation-hardened microelectronics and photonics for DoD missions through private sector and government organizations. This is achieved

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Project BH - System Survivability (cont'd)

through the development and demonstration of enabling technologies to ensure the continued availability of special materials and radiation-hardened (RH) microelectronics and photonic devices.

Simulator Technology. Since the underground testing (UGT) moratorium, simulators have provided the only remaining experimental test bed for the development and validation of radiation-hardened DoD systems. The intensity and fidelity of these simulators do not match that of the UGT testbed, but, through this program, the agency develops, provides and maintains unique DoD radiation test facilities and enabling technologies that are used by the Defense Agencies, the Services and other federal departments (such as DOE) to evaluate the impact of hostile environments on military systems that support missions in the air, on land, at sea, or in space. The program also develops technologies to improve the intensity, fidelity, reliability, reproducibility, and cost effectiveness of existing and future simulators (including radiation sources, power flow and conditioning components, energy storage, diagnostics, instrumentation, other test support equipment, debris shields, and numerical models and computer codes for radiation sources and pulsed power components and test beds); develops concepts, plans, and risk reduction strategies for an affordable next-generation radiation simulator with substantially improved intensity and fidelity; based on user test requirements, support improvements to the two existing test centers, one at Maxwell Physics International (MPI) in San Leandro, California, and one at the Arnold Engineering Development Center (AEDC) in Tullahoma, Tennessee; installs and characterizes upgrades to the new Decade x-ray simulator and to existing radiation simulators at MPI. The Defense Science Board Task Force on Nuclear Effects Simulation is studying the need for improving DTRA's radiation simulator capabilities. Its recommendations will form the basis for a restructured program which could aggressively pursue developing some of the capability lost with the moratorium on underground testing.

Operability Assessments. Directly responds to warfighter and acquisition program survivability needs by providing solutions, including development of affordable technologies and methodologies for system-level and family-of-system-level assessments, hardening, and

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Project BH - System Survivability (cont'd)

testing of the effects of nuclear weapons. Includes development and demonstration of cost-effective system design and test certification techniques to produce hardware that can be tested without the need for underground nuclear tests. Provides testable system design rules and protocols for users of nuclear effects simulators.

Balanced Electromagnetic Hardening. Provides the necessary science and technology to ensure protection and survival of military battlefield and civilian infrastructure electronic systems against multiple EM environments, including nuclear electromagnetic pulse (EMP), high power microwaves (HPM), as well as WMD threats. Designs and develops innovative, low-cost, balanced EM protection and test technologies for weapon, C3, and supporting infrastructure systems to the CINCs, Services and other DoD agencies.

Includes development of high-power electromagnetic source technology for warfighting applications and hardening technologies for emerging radio frequency (RF) threats.

Human Survivability. Applies lessons learned from the Nuclear Test Personnel Review Program (O&M-funded) to allow warfighters and peacekeepers to quantify/mitigate the risk in post-Cold-War settings (i.e., limited nuclear exchanges, terrorist actions, radiological dispersal weapons, and other radiation risk scenarios) by developing field measurement and dosimetry systems to support military radiological guidelines for the protection of human resources. This provides direct support to warfighters by predicting and quantifying the operational impact of nuclear, biological and chemical (NBC) and conventional battlefield environments on systems and personnel; providing methods for measuring and increasing soldier effectiveness on NBC battlefields; providing performance and cost analysis to support the Defense Acquisition Board; and joint efforts with system program offices to apply the Agency's expertise and technologies to specific Service applications.

Project BH supports the following JCS Joint Warfighting Capabilities: Information Superiority, Counterproliferation, Electronic Warfare, and Precision Force.

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Project BH - System Survivability (cont'd)
FY 2001 Plans

Radiation Tolerant Microelectronics (\$20,400K)

Demonstrate prototype radiation-hardened memory circuits capable of storing one million bits of information and retaining the information in the absence of power. Complete the qualification, for space applications, of radiation-hardened memory circuits capable of storing four million bits of information.

Demonstrate technology to support the development of a radiation-hardened processor circuit capable of providing at least 100 million instructions-per-second operation.

Demonstrate advanced technology to support the development of radiation-hardened circuits capable of processing both analog and digital information.

Demonstrate a radiation-hardened 24 million (4 million gates) transistor circuit array to support satellite and missile onboard data processing needs.

Test and evaluate combined electrical and optical technology for wideband data processing applications.

Simulator Technology (\$18,120K)

Operate and improve DTRA's radiation simulators to support nuclear weapons effects testing.

Demonstrate the cold x-ray source for the Decade Quad and optimize output to double the initial yield

Demonstrate high-fidelity (>5 keV) cold x-ray source for advanced radiation simulators using a high-energy test facility ("Z") at Sandia National Laboratories.

Continue large-area (>500cm²) debris shield development for cold x-ray sources on the Decade Quad.

Complete the improvement of modular opening switch efficiency.

Begin the development of compact energy storage technology to improve the performance of the Compact X-ray Simulator by ten times in the same size package.

Begin to develop higher fidelity laser x-ray sources based on a higher power laser facility at the University of Rochester.

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Project BH - System Survivability (cont'd)

Continue the development of technology to dramatically improve the capability of non-nuclear x-ray test facilities.

Operability Assessments (\$8,917K)

Continue assessment and testing of critical national security assets.

Update development of the network assessment tool for USSPACECOM based on DTRA past assessments.

Complete MILSTAR transition operability assessment.

Develop a subsystem controller for fast circumvention and recovery (C&R) after radiation exposure.

Develop nuclear environment software modules for integration with Hardware-in-the-Loop (HWIL) facilities.

Conduct testing of User Early Warning Radars (UEWRs) in support of National Missile Defense (NMD) program upgrades. Develop radar disturbance mitigation techniques for NMD ground-based radar (GBR) and UEWRs.

Provide infrared (IR) scene testing of NMD/TMD (Theater Missile Defense) sensors.

Support IR and communications testing of Space-Based Infrared Satellite (SBIRS).

Continue communication/radar atmospheric effects participation in operational/warfighting exercises.

Complete development of an advanced IR scene generator.

Balanced Electromagnetic Hardening (\$8,235K)

Develop a unified electromagnetic (EM) environmental effects protection design tool.

Conduct integrated EMP/HPM test methods study.

Conduct case study on EM effects on civilian infrastructures supporting key DoD missions.

Perform HEMP test of National Military Command Center (NMCC).

Initiate Mission Degradation Analysis (MIDAS) case study on civilian infrastructure.

Complete proven commercial off-the-shelf (COTS) hardware kit, which provides easy-to-install devices and simple techniques to harden COTS computers against RF threats.

Perform susceptibility testing on at least one new class of foreign or U.S. asset.

Complete loan arrangement with service partner on amplitron modification.

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Project BH - System Survivability (cont'd)

Leading a joint working group of Navy and Air Force representatives to investigate the phenomenology of the interaction of high power radio frequency signals at the semiconductor junction level for disruption and damage effects. Extend results to circuit board and subsystem level to examine the synergetic effect on the circuit's functionality due to the external signal. Interpret the results to build models explaining how electronics are disrupted, and how we can better protect them.

Human Survivability (\$1,085K)

Continue development and evaluation of radiation protection standards and risk measures applicable to personnel/equipment for NATO review.

Implement "lessons learned" from test and evaluation to fielded fly-away dosimetry system.

Adapt/develop battlefield radiological measurement systems to unmanned aerial vehicle (UAV) platform.

Initiate conceptual development of biological dosimetry capability for fly-away dosimetry system.

Investigate new methods/agents for decontaminating mission-essential equipment that is radiologically contaminated above military guidelines.

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B. Program Change Summary

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
Previous President's Budget	211.4	203.5	206.5
Current President's Budget	210.0	214.5	230.9

Change Summary Explanation:

The budget request represents a highly leveraged science and technology (S&T) program, consistent with Departmental S&T objectives. As part of the effort to better focus the Agency organization and resources to the threat reduction mission, substantial restructuring of DTRA's Program Element construct has occurred.

Changes in FY 00 are direct results of Congressional emphasis in the areas of Nuclear Weapons Effects, Discrete Particle Methods, X-ray simulators, "Deep Digger" and Thermionics technology. Changes in FY 01 support critical weapons of mass destruction assessments and response efforts.

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RDT&E, Defense-Wide/Advanced Technology Development - BA3				Counterproliferation Support; 0603160BR				
Cost (In Millions)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete
Total 0603160BR Cost	51.9	80.6	77.4	76.9	80.3	82.1	83.8	Continuing
Project BB - Small Business Innovative Research (SBIR)	0.0	0.0	1.7	1.7	1.8	1.8	1.9	Continuing
Project BJ - SOF Counterproliferation Support	12.8	19.3	19.6	17.6	18.3	18.7	19.2	Continuing
Project BK - Counterforce	39.1	61.3	56.1	57.6	60.2	61.6	62.7	Continuing

A. Mission Description and Budget Item Justification - In August 1994, DoD established the Counterproliferation Support Program specifically to address the DoD shortfalls in counterproliferation operational capabilities documented in the May 1994 Report to Congress titled *Report on Nonproliferation and Counterproliferation Activities and Programs*. Counterproliferation Support Program funds were designed to leverage DoD acquisition programs to meet the counterproliferation priorities of the Commanders-in-Chief (CINCs) of the Combatant Commands and accelerate deployment of enhanced capabilities to the field. Specifically, the goal of the Counterproliferation Support Program was to improve specific military counterproliferation capabilities by (1) building upon ongoing programs in the Services, DoD agencies, Department of Energy and United States Intelligence; (2) focusing on the most critical counterproliferation shortfalls to address major gaps in deployed capabilities (as reflected in the CINCs' priorities and the Counterproliferation Review Committee's (CPRC) prioritized list of counterproliferation Areas for Capability Enhancement); (3) leveraging existing program funding to more rapidly field capabilities by accelerating the deliverables of DoD programs; (4) identifying and enhancing development of high payoff technologies to accelerate capabilities to the warfighter; (5) identifying and promoting key non-material initiatives that complement technological advances; (6) transitioning Counterproliferation Support Program projects to the Services as soon as practicable; and (7) procuring counterproliferation unique development products for CINCs.

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A. Mission Description and Budget Item Justification (cont'd)

Counterproliferation (CP) is the activity in DoD to combat the spread of nuclear, biological, and chemical (NBC) weapons and their means of delivery. Activities include arms and export control, intelligence collection and analysis, counterforce, active defense, passive defense, and consequence management. Effective in October 1998, DoD created a single agency, the Defense Threat Reduction Agency (DTRA), which is responsible for all the counterproliferation activities except active defense and intelligence. The DTRA now manages the former Counterproliferation Support Program. Focusing counterproliferation activities in DTRA will improve integration and further leverage warfighter capabilities. The funds in this program element support development, integration and demonstration of enhanced capability for the warfighter.

During its first year of operation, DTRA faced many challenges in the process of focusing agency organization and resources to the threat reduction mission. This has required a transition from predecessor agencies' legacy programs and support baseline resources to integrated DTRA programs and resources. Particular attention has been devoted to realigning the research and development investment programs.

To better support the DTRA program and resource structure, a new program element (PE) code construct has been designed and approved. The projects designated in this PE are products of this realignment.

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Project BB - Small Business Innovative Research (SBIR) - This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported research and development results. These efforts are responsive to PL 102-564.

FY 2001 Plans

SBIR Total (\$1,725K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

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Project BJ - Special Operations Forces (SOF) Counterproliferation Support - In 1995 the SecDef assigned the core task of countering the proliferation of weapons of mass destruction (WMD) to SOF. This project directly supports SOF contributions to the nation's effort to counter the spread of WMD. Efforts in this project include the defeat of hard and deeply buried targets (HDBT), explosive ordnance disposal (EOD), and maritime efforts to prevent the spread of WMD technology. This project supports requirements that apply to all three of the efforts identified above.

Details of this program have been classified per CJCSM 5225-01 dated 23 Oct 96.

Project BJ - SOF Counterproliferation Support (cont'd)

FY 1999 Accomplishments

SOF Projects (\$12,763K)

Specific details are classified.

FY 2000 Plans

SOF Projects (\$19,263K)

Specific details are classified.

FY 2001 Plans

SOF Projects (\$19,555K)

Specific details are classified.

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Project BK - Counterforce - The purpose of this project is to develop technologies, demonstrate prototype systems in an operationally realistic environment, support operators in the definition of the concept of operations, and provide combatant commanders with enhanced capabilities in response to potential adversaries who have the capability to develop and/or employ nuclear, biological and chemical (NBC) weapons of mass destruction (WMD) in future regional conflicts involving the U.S. or its allies. The U.S. requires the capability to attack and neutralize NBC research, production, storage, operations and support, and command and control facilities while mitigating collateral effects resulting from expulsion and release of NBC agents. The potential target sets include fixed, aboveground and underground, hardened and unhardened, and tunnel facilities. The project is structured to exploit ongoing technology programs wherever possible. The project emphasis is on functional kill as well as hard kill and on mitigating collateral effects through advanced weapon development and greatly enhanced target attack planning to optimize weapon employment. The goal is the development of an enhanced counterforce mission capability to include penetrating weapons, WMD combat assessment, and the supporting planning tools. Prototype or modified systems integrating these technologies will then be evaluated in demonstrations, and, in some cases, a residual operational capability is provided to combatant commanders.

This project emphasizes technology demonstrations to include Advanced Technology Demonstrations (ATD) and Advanced Concept Technology Demonstrations (ACTD). Three demonstrations are currently planned, the Second Counterproliferation (CP2) Counterforce ACTD, the Hard Target Defeat (HTD) program, and the Nuclear Facility Defeat (NFD) demonstration.

The CP2 ACTD objective is to develop, demonstrate, and deliver enhanced standoff, counterforce capabilities in conjunction with operational concepts to combatant commanders for planning attacks and timely, reliable defeat of WMD related facilities while minimizing collateral hazards. The CP2 ACTD depends on the technology base and products in PE 0602715BR, Project BD for planning tools and on test planning and execution support in PE 0602715BR, Project BE for the operational demonstrations. The Navy and Air Force

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Project BK - Counterforce (cont'd)

provide weapons technologies to this ACTD. The CP2 ACTD has been approved by the Deputy Under Secretary of Defense (Advanced Systems and Concepts) (DUSD(AS&C)), and the management plan was signed in April 1999. USEUCOM is the operational sponsor with USACOM and USSTRATCOM participating. The CP2 ACTD started in FY98 and will be completed in FY03.

The HTD program objective is to develop and demonstrate end-to-end capabilities for the functional defeat of hard targets, particularly tunnels, and assess developing weapon and sensor concepts against such targets. The program does not develop new sensors; it assesses existing or emerging technologies being developed by others. The HTD program develops technologies under PE 0602715BR, Project BF and transitions them to this program for demonstration. The demonstrations require test planning and execution support from PE 0602715BR, Project BE. The currently planned HTD demonstration ends in FY03. HTD customers are USPACOM, USSTRATCOM, USSOCOM, and the Air Force's Air Combat Command.

The products from NFD demonstrations will enable the National Command Authority (NCA) and combatant commands to deny critical nuclear production, processing, fabrication and storage capability of an adversary, without the prohibitive political consequences of large radiation releases downwind of the target. Once the intelligence community determines the adversary's nuclear production cycle, critical facilities can be targeted to eliminate overall capability. NFD provides methods to functionally kill selected facilities and to predict and minimize resulting collateral effects. Additionally, this program will enhance our ability to predict the consequences of terrorist action against nuclear facilities. The NFD program develops technologies under PE 0602715BR, Project BF, and transitions them to this program for demonstration. The demonstrations require test planning and execution support from PE 0602715BR, Project BE. NFD demonstration starts in FY03.

The project milestones supporting the planned demonstrations and product delivery are broken into six major product areas or subprojects: WMD combat assessment, collateral effects prediction, target response, CP Analysis and Planning System (CAPS), weapons, and operational demonstrations.

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Project BK - Counterforce (cont'd)

1. WMD Combat Assessment. This subproject has evolved from the former CP1 ACTD sensor subproject to provide WMD combat assessment capabilities. This effort will provide improved warfighting capabilities against the spectrum of NBC facilities. This subproject will leverage existing programs to (1) evaluate near-term technologies; (2) define concepts of operation and system architecture for WMD combat assessment; (3) produce data fusion and mission planning modules to meet user requirements on existing platforms; and (4) integrate WMD combat assessment capabilities onto delivery systems, such as unmanned air vehicle (UAV) and expendable mini-UAV platforms. Further, the effort will demonstrate the ability to confirm, identify, and assess the release of radiation or biological/chemical agents in support of attacks on NBC facilities and assist in predicting transport patterns by updating pre-strike predictions of the potentially hazardous plume with real-time data. The WMD combat assessment subproject will not develop its own sensors, but will leverage ongoing chemical sensor efforts within the chemical and biological defense community to minimize program risk for applying this technology to counterforce missions. This subproject will also monitor the progress of point biological agent detectors for potential incorporation into the WMD combat assessment system.

2. Collateral Effects Prediction. The collateral effects effort provides predictive tools for a variety of applications supporting NBC target attack planning to include NBC expulsion and dispersion resulting from attacks on WMD facilities as well as acts of terrorism and hostile use of WMD. Requirements include high-resolution weather models, weather measurement systems, and population databases. A key element in developing these collateral effects codes is chemical/biological expulsion tests and modeling. Modeling of chemical/biological expulsion sources will be based on theoretical model and empirical data. Codes will be validated from existing data, other predictive models and special collateral effects experiments. For NFD, small-scale testing, nuclear experimentation and engineering analysis of baseline nuclear facilities will be conducted. Models and software tools to extend the baseline analysis to site-specific nuclear fuel cycle facilities will be developed. The collateral effects tools will provide pre-attack prediction and post-

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Project BK - Counterforce (cont'd)

attack assessment. The Hazard Prediction and Assessment Capability (HPAC) is a major product that predicts the release and transport of NBC materials and the subsequent collateral effects. The high resolution weather prediction capability, another area of emphasis in the subproject, will provide timely wind, cloud, and precipitation data necessary for NBC collateral effects predictions. Weather data currently does not have the resolution or quality necessary. This weather data will also be available to other users in the theater such as Joint Warning Network (JWARN). These tools will also be integrated into the target attack planning tools to assess the consequences of attacks on WMD facilities.

3. Target Response. This effort will provide a new target attack planning, combat assessment capability and a major upgrade for existing theater-level planning capabilities for defeating or denying NBC facilities and capabilities. This effort builds upon the Integrated Munition Effects Assessment (IMEA) planning tool developed for CP1. IMEA provides a forward deployable, target planning capability for NBC targets. IMEA is an integration of the Munitions Effects Assessment (MEA) tool providing targeting solutions using conventional weapons for a variety of structures and equipment and the HPAC developed under the Collateral Effects Prediction subproject. The integrated capability supports the warfighters in the attack planning phase with target response and collateral effects prediction, and in the post-attack phase with combat assessment and re-strike decision support. Upgrades to IMEA for the CP2 ACTD include additional target types (including complex facilities), additional weapons (including multiple weapon effects), additional platforms, more operator-friendly displays, more WMD material types, weather interfaces and sources, and more detailed weapon input parameters (such as angle of attack). The ultimate CP2 IMEA product will be able to run stand alone or in a web-based client-server distributed architecture as it migrates into the Integrated Target Planning Tool Set (ITPTS) suite of tools, the second deliverable during CP2. The ITPTS will provide a spectrum of planning capabilities from deliberate to crisis. ITPTS provides the warfighter a standardized weaponeering framework that greatly increases weaponeering efficiency and fidelity while minimizing warfighter training requirements. It expedites cross service weaponeering and joint planning. The ITPTS architecture provides cross

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Project BK - Counterforce (cont'd)

platform interoperability and a common look and feel, independent of weapon or target. In addition, it provides the warfighter critical decision support services for all target classes including those associated with weapons of mass destruction. ITPTS will also predict weapons performance and associated NBC collateral effects, develop targeting solutions that minimize collateral effects, and provide results through appropriate interfaces for a variety of targets including functionally and structurally complex facilities. ITPTS will provide an enhanced interface to the Intelligence Community (IC). The ITPTS will include an interface to the Joint Targeting Toolbox (JTT) and the CP Analysis and Planning System (CAPS). The ITPTS requires significant input from the IC including data regarding NBC facilities, processes, and surrounding populations. CAPS will provide a large part of this input. This effort will support the IC in developing the necessary interfaces to provide for the efficient transfer of intelligence data. The ITPTS "plug and play" architecture is required to accommodate differing concept of operations (CONOPS), theaters, and performers in several geographic locations. This effort will execute a full verification and validation program, in accordance with the Joint Technical Coordinating Group for Munitions Effects Procedures, for all delivered capabilities including extensive field testing at all functional levels.

4. CP Analysis and Planning System. The Counterproliferation Analysis and Planning System (CAPS) responds to the need for comprehensive and timely counterproliferation target planning for combatant commanders. Products from CAPS include databases of country specific proliferation pathways for Nuclear, Biological and Chemical (NBC) weapons. The analysis provides combatant commanders assessments of a country's capabilities and identifies key facilities to effect that capability, thus supporting the combatant commanders in the planning and execution of their CP missions. These analyses are conducted in successive levels of detail called tiers (with tier 1 being broadest/highest). As an output of the analyses, CAPS provides planners with critical elements for taking actions against WMD proliferation programs of suspect countries and analyzes the environmental consequences of these actions. CAPS is conducted in support of CINC CONPLAN 0400 targeting requirements. The Counterproliferation Mission Support Senior Oversight Group (CP MS SOG) Requirements

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Project BK - Counterforce (cont'd)

Subcommittee and CINC representatives have determined the top 14 CINC priority topics for CAPS analysis. The four major aspects of the program are: 1) integration of intelligence and production process analyses to create country models of proliferation efforts underway in selected countries by identifying the specific function and location of major production sites, and development of a detailed layout of these sites within each country; 2) element analyses of each country model in order to select critical nodes in the country's proliferation pathway, to include facilities essential to research, production, weaponization or storage, which if removed, would require significant time to replace; 3) execution of consequences analyses for possible interdiction/counterforce actions to quantify the level of damage that might occur including possible casualties, economic losses, and environmental issues; and 4) provision of completed analyses via secure means to the user community in a logical and user friendly format, incorporating the latest advances in computer software development.

5. Weapons. Conventional explosive-filled weapons are often relatively ineffective in destroying large underground reinforced concrete facilities. Even if the weapon detonates inside the facility, substantial interior walls and/or floors often confine the blast and fragmentation, thus causing significant overpressure and venting through the penetration hole. In soft buried and aboveground facilities, conventional explosive-filled weapons often result in complete and uncontrolled destruction. The random use of conventional weapons greatly increases the risk of agent dispersal that may result in extensive civilian or force casualties. This subproject will develop, integrate and demonstrate advanced conventional weapons technologies to improve mission effectiveness against NBC facilities while mitigating collateral effects. The focus for CP2 ACTD is to provide combatant commanders with a demonstrated option to attack NBC facilities in a standoff mode. This effort will improve on existing standoff weapon platforms to provide enhanced penetration, advanced fuzing, and enhanced payloads that can reduce collateral effects by neutralizing agents before they are released or reducing the amount released. Standoff weapons to be enhanced include the Tactical Tomahawk Land Attack Missile in a penetrator variant and the Conventional Air Launched Cruise Missile (CALCM). Enhanced payloads will

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Project BK - Counterforce (cont'd)

explore alternate warhead options to conventional blast/fragmentation with the objective of mitigating collateral effects associated with dispersal of NBC. NFD will assess a suite of current conventional weapon effects against nuclear facilities and corresponding components and develop weapon enhancements such as fuzing and guidance systems that maximizes functional defeat and minimizes collateral effects. HTD will demonstrate a variety of conventional and non-conventional (non-nuclear) weapons to functionally defeat tunnels.

6. Operational Demonstrations. This subproject will improve the operational capability for holding NBC targets at risk with minimum collateral effects. The objective is to integrate available or near-term technologies for WMD combat assessment, weapons, collateral effects prediction, and target planning tools, to evaluate the technologies in an operational context, and to transition improved capabilities rapidly to combatant commands. Specifically, this subproject will enhance and accelerate existing programs to provide integrated target planning, collateral effects prediction codes, a WMD combat assessment system, and advanced weapons to meet NBC target defeat requirements. This subproject will also support demonstration operations to include system operational concept, demonstration planning, scenario development, execution of the demonstration, and post-demonstration analysis. Planning and execution of the demonstration uses a time phased approach to screen candidate technologies for maturity, develop prototype systems and demonstrate enhancements in military capability against a combatant command prioritized subset of all potential NBC target types. This approach results in a cycle of prototype development and testing followed by periods of operational demonstration.

Three operational demonstration series are planned during CP2 ACTD over the period of FY2000-2003 to provide the operational sponsor, United States European Command, and participating commands with the opportunity to assess the utility of the selected technologies. The objective of the first demonstration series in CP2 ACTD, called Dipole Yukon (DY), is to demonstrate the capability to plan and execute chemical/biological (C/B) counterforce missions with the Joint Air-to-Surface Stand-off Missile (JASSM) through

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Project BK - Counterforce (cont'd)

operationally realistic attacks against a simulated biological weapons storage facility. The objective of the second demonstration, called Dipole Zodiac (DZ), is to assess the suitability of the CALCM with a penetrating warhead and a Predator unmanned air vehicle (UAV) based standoff collateral effects assessment system. The objective of the third demonstration series, called Divine Canberra (DC), is to evaluate the end-to-end set of products of the CP2 ACTD including the target planning tool, in its final operational context, the Tactical Tomahawk Penetrator Variant (TTPV), and remote combat assessment using a small expendable mini-UAV with a chemical point detector on-board (and deployed from the Predator UAV demonstrated in DZ) against a hard chemical production and storage facility.

HTD will conduct demonstrations on tunnels and hard facilities using developed target planning tools and weapon concepts. The currently planned demonstration ends in FY03 and employs a tunnel target with a command, control, communications and intelligence (C3I) function. The objective will be to demonstrate a functional kill capability.

NFD will conduct large-scale demonstrations to validate models and test sensor and weapons systems. Demonstrations will exercise all program elements and refine postulated concepts of operation for combatant commands and mission planners.

For FY 2001, PE 0605160BR, Project P542 funding and activities are transferred to this project.

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Project BK - Counterforce (cont'd)

FY 1999 Accomplishments

WMD Combat Assessment (\$3,198K)

Continued integration, fabrication, demonstration of modifications for standoff chemical agent assessment system.

Evaluated biological detectors for the counterforce role.

Continued development of the High Frequency Active Auroral Research Program (HAARP).

Collateral Effects Prediction (\$6,598K)

Delivered a theater weather server and provided high-resolution predictive weather capability for regional operations.

Continued validation tests for collateral effects modules.

Delivered HPAC 3.2.

Delivered soft chemical facility hazard source term model.

Initiated urban collateral effects model development.

Developed worldwide land cover and population database for collateral effects casualty predictions.

Target Response (\$8,155K)

Integrated a multiple weapon capability into IMEA to support CP2 demonstrations.

Enhanced WMD component damage prediction models to include multiple weapons.

Executed scale tests/analyses and validated target planning tools.

Initiated development of ITPTS.

Supported SOF project (details are classified).

CP Analysis and Planning System (\$6,000K)

Defined hardware, software validation, and WMD facility analysis and database population requirements for the Counterproliferation Analysis and Planning System (CAPS).

Installed CAPSNET terminals to identified users.

Weapons (\$13,084K)

Fabricated and tested Hard Target Smart Fuze (HTSF) hardware with expanded capabilities.

Conducted CALCM penetrator systems design and integration.

Conducted TTPV penetrator systems integration.

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Project BK - Counterforce (cont'd)

Initiated TTPV penetrator payloads system design.
Initiated TTPV penetrator missile systems design and engineering.
Initiated TTPV penetrator air-vehicle modification design and fabrication.
Continued smart fuze design to meet Navy certification requirements.
Continued TTPV penetrator warhead design, fabrication, and test.
Initiated TTPV penetrator command and control modifications.
Initiated TTPV penetrator system test and evaluation.
Completed scale tests of selected high temperature incendiaries (HTI) and chemical neutralization agents against simulated chemical and biological agents.
Continued modeling and simulation to support enhanced payloads concept screening and down select.

Operational Demonstrations (\$2,156K)

Prepared Dipole East (DE) 169 target (soft metal structure for simulated wet biological demonstration).
Conducted Dipole East 169 demonstration.
Completed target construction for Dipole Yukon 1.

FY 2000 Plans

WMD Combat Assessment (\$9,000K)

Initiate integration, fabrication, and demonstration of air platform modifications to provide chemical agent assessment capability.
Continue integration and test of standoff (remote) chemical assessment system.
Continue to configure, fabricate, and test components for chemical point (contact) detector.
Design agent sample capture approach.
Initiate development of concept of operations, communications, data fusion/display ground station, and interface requirements.
Collateral Effects Prediction (\$4,100K)
Deliver a biological hazard source model and transport capability for soft facilities.
Develop high-resolution databases for real populations and real land surfaces for customer determined locations.

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Project BK - Counterforce (cont'd)

Develop human effects model for civilian populations to better predict WMD collateral effects (casualties).

Deliver theater weather server with high fidelity weather model.

Deliver initial urban collateral effects capability.

Deliver HPAC 4.0 for Dipole Yukon.

Target Response (\$4,783K)

Deliver IMEA 4.0 software to support CP2 ACTD (Dipole Yukon 1).

Deliver a multiple weapon capability for IMEA.

Demonstrate ITPTS prototype with three integrated tools.

Deliver Joint Air-to-Surface Standoff Missile (JASSM) weapon effects/performance models for IMEA.

Deliver modeling capability for a complex aboveground target.

Initiate Component Vulnerability and Agent Release/Agent Release Model (CVAR/ARM) Validation tests program.

Deliver weapons effects/performance models for the Tactical Tomahawk Penetrator Variant (TTPV).

Deliver cruise missile (TTPV) performance model for IMEA.

CP Analysis and Planning System (\$10,000K)

Begin CAPS analysis on top 14 combatant commanders' requirements as defined by CP MS SOG and complete this analysis to Tier 3-level, the identification of critical buildings at major sites.

Install, or plan the installation of, CAPSNET terminals at all major commands and interested support agencies.

Weapons (\$22,931K)

Develop and qualify CALCM Block II penetrator system.

Conduct TTPV penetrator systems integration.

Continue TTPV penetrator warhead design, fabrication, and test.

Continue TTPV penetrator command and control modifications.

Continue TTPV penetrator payload system design.

Continue TTPV penetrator missile systems design and engineering.

Continue TTPV penetrator air-vehicle modification design and fabrication.

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Project BK - Counterforce (cont'd)

- Conduct TTPV penetrator system test and evaluation.
- Conduct enhanced payloads static scaled tests against soft chemical/biological targets.
- Conduct modeling and simulation support for enhanced payload development.
- Conduct design and effectiveness studies for HTD classified weapon concepts.
- Conduct modeling and simulation support for enhanced payloads scale testing.

Operational Demonstrations (\$10,505K)

- Conduct Dipole East 165 and 166 demonstrations.
- Analyze demonstration results and report.
- Complete target construction for Dipole Zodiac demonstration.
- Complete planning exercises for Dipole Yukon 1 demonstration.
- Complete target construction for Dipole Yukon 2.
- Support CP analysis for concept of operations development.

FY 2001 Plans

WMD Combat Assessment (\$8,800K)

- Integrate standoff (remote) assessment system on air platform.
- Test remote assessment system on air platform during Dipole Zodiac.
- Continue to configure, fabricate, and test components for chemical point detector.
- Implement agent sample capture design.
- Conduct simulant and agent tests for sampling, remote and point sensors.
- Continue to develop concept of operations, communications, data fusion/display ground station, and interface requirements.

Collateral Effects Prediction (\$5,900K)

- Deliver final hazard source models for CP2 ACTD standoff weapons.
- Develop modeling for urban internal transport.
- Deliver Meteorological Data Server in IPTS architecture.
- Deliver human effects module integrated with population data.
- Validate weather models and wind field data for priority regional areas.
- Develop IPTS access to HPAC capabilities.
- Deliver HPAC 5.0 for Dipole Zodiac.

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Project BK - Counterforce (cont'd)

Target Response (\$5,000K)

- Deliver IMEA 5.0 software to support Dipole Zodiac and Dipole Yukon 2 (JASSM).
- Deliver CALCM weapon effects/performance models.
- Complete Component Vulnerability and Agent Release/Agent Release Model (CVAR/ARM) validation tests.
- Initiate IMEA C3I facility model validation testing.

CP Analysis and Planning System (\$8,843K)

- Complete CAPS analysis on the top 14 combatant commanders' priorities, to the Tier-5 level, detailed inside-the-building analysis needed for SOF and precision strike operations.
- Begin analysis on the next group of combatant commanders' priorities, to be completed to various Tier levels in the priority order assigned by the CP MS SOG.
- Complete CAPSNET terminal installation at all major commands and interested support agencies.

Weapons (\$17,195K)

- Conduct TTPV penetrator systems integration.
- Continue TTPV penetrator warhead design, fabrication, and test.
- Complete TTPV penetrator command and control modifications.
- Continue TTPV penetrator payload system design.
- Continue TTPV penetrator missile systems design and engineering.
- Continue TTPV penetrator air-vehicle modification design and fabrication.
- Conduct TTPV penetrator system test and evaluation.
- Conduct full scale enhanced payload tests against chemical/biological targets.
- Complete modeling and simulation of selected enhanced payloads concept.
- Continue design and effectiveness studies for HTD classified weapon concepts and conduct preliminary testing.

Operational Demonstrations (\$10,373K)

- Conduct Dipole Yukon 1 demonstration.
- Analyze Dipole Yukon 1 demonstration results and report.
- Conduct all Dipole Zodiac (1 and 2) demonstrations.
- Analyze Dipole Zodiac demonstration results and report.

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B. <u>Project Change Summary</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>
Previous President's Budget	53.0	81.2	75.8
Current President's Budget	51.9	80.6	77.4

Change Summary Explanation:

As part of DTRA's efforts to better focus the Agency organization and resources to the threat reduction mission, funds from PE 0605160BR, Project 542 (CP Architecture Studies and Management Oversight) were realigned to this PE beginning in FY 2001.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE	
							February 2000	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA3				R-1 ITEM NOMENCLATURE Arms Control Technology; 0603711BR				
COST (In Millions)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete
Total 0603711BR Cost	57.2	73.5	52.9	50.0	49.6	50.2	51.4	Continuing
Project BB - Small Business Innovative Research (SBIR)			.8	.8	.9	.9	.9	Continuing
Project BI - Arms Control Technology	57.2	73.5	52.1	49.2	48.7	49.3	50.5	Continuing

- A. Mission Description and Budget Item Justification - This program element (PE) provides research, development, test, and evaluation (RDT&E) to meet technology requirements in support of implementation, compliance, monitoring and inspection for existing and emerging arms control treaties and agreements. The funded projects address requirements validated by the Office of the Under Secretary of Defense (Acquisition, & Technology, & Logistics (OUSD(AT&L)) to implement, comply with, and monitor the following treaties/agreements: The Treaty on the Reduction and Limitation of Strategic Offensive Arms (START); the Treaty on Further Reduction and Limitation of Strategic Offensive Arms (START II) (START III); the Anti-Ballistic Missile (ABM) Treaty; the Intermediate-Range Nuclear Forces (INF) Treaty; the Conventional Armed Forces in Europe (CFE) Treaty; the Open Skies (OS) Treaty; the Convention on Certain Conventional Weapons (CCW); the Chemical Weapons Convention (CWC); Biological Weapons Convention (BWC); Comprehensive Test Ban Treaty (CTBT); Safeguards, Transparency and Irreversibility (STI) agreement; Missile Technology Control Regime (MCTR); Nuclear Non-proliferation Treaty (NPT); Fissile Material Cut-off Treaty (FMCT); Organization for Security and Cooperation in Europe (OSCE) Confidence- and Security-Building Measures (CSBMs); United Nation's Transparency in Armaments (TIA) Agreement; Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies; the CFE Adaptation negotiations; the Anti-Personnel landmine (APL) negotiation; and Presidential arms control initiatives.

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Mission Description and Budget Item Justification (cont'd) - This PE conforms to the Administration's research and development priorities as related to both conventional arms control and weapons of mass destruction arms control and disarmament. Arms control technologies are critical for enabling the U.S. to monitor, verify and implement international arms control treaties and other agreements whose purpose is to prevent the proliferation of and/or reduce nuclear, chemical, biological, and advanced conventional weapons. Technical assessments are made to provide the basis for sound project development, evaluate existing programs, and provide the data required to make compliance judgments and support U.S. policy and decision-makers and negotiating teams. Technology developments and system improvements projects are conducted to ensure that capabilities to monitor, comply with, and implement treaties and agreements are available when required.

The program includes development of equipment and procedures for data exchanges, on-site and aerial inspections and monitoring, and other confidence-building measures. In addition, assistance is provided to the Office of the Secretary of Defense by providing technical support in preparing for U.S. compliance with treaty obligations. Hardware and procedures developed are often transitioned to the appropriate inspectorate for use in conducting treaty mandated inspection and monitoring and for implementing transparency and confidence-building regimes. Where applicable, RDT&E to meet requirements in one treaty area is applied to fulfill requirements in other areas to eliminate duplication of efforts. The technologies and procedures developed in the arms control technology program provided an invaluable source of information on equipment and procedures that was extensively used by an Agency team to support an interagency assessment of Long Term Monitoring of Iraq. The results of the effort and equipment developed in this program are also being used to implement the provisions of United Nations Resolution 715. The Agency's synergistic approach to fulfilling arms control requirements has been maximized in data management development. Arms control treaties require extensive exchanges of data concerning treaty accountable items, initial declarations, movements, etc., by signatory nations. The Agency has developed a treaty information management system, the Compliance Monitoring and Tracking System (CMTS), to accommodate these data exchanges and monitor U.S. compliance with treaty data reporting provisions. The CMTS provides treaty-required data exchanges and monitors U.S. compliance with treaty data reporting provisions.

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Mission Description and Budget Item Justification (cont'd) - The CMTS provides treaty-required data exchanges for INF, START, CFE and Confidence- and Security-Building Measures. The Open Skies Notification System (OSNS) is being developed to support anticipated treaty entry-into-force (EIF). This PE also supports the JCS warfighting capability area of counterproliferation.

In FY 1999, the architecture for presentation/execution of this program changed. Elimination and realignment of the Implementation and Compliance (I&C) category resulted in all negotiation, compliance, and implementation efforts moving to the Technical Assessments category. All hardware and software developments in I&C have moved to the Technology Development or Improvements category to reflect the actual nature of the effort. During its first year of operation, DTRA has overcome many challenges in the process of focusing agency organization and resources to the threat reduction mission. This has required re-aligning predecessor agencies' legacy programs and support baseline resources into an integrated DTRA program and resource structure. Particular attention has been devoted to realigning the research and development investment programs. Project BI is a product of consolidating what were previously four projects in this PE: Strategic Arms Control Technology (Project CA), Conventional Arms Control Technology (Project CB), Chemical and Biological Arms Control Technology (Project CC), and Nuclear Arms Control Technology (Project CD).

Project BB - Small Business Innovative Research (SBIR) - This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported research and development results. These efforts are responsive to PL 102-564.

FY 2001 Plans

Small Business Innovative Research (\$813K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

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Project BI - Arms Control Technology - This project provides an integrated and comprehensive approach to meeting the technology requirements associated with achieving national defense arms control objectives. The major activities consist of the following:

Develop procedures and equipment that will enable the USG to effectively exercise treaty inspection rights and monitor compliance and reporting associated with anticipated future treaty requirements in the most non-intrusive and cost-effective manner. Objectives include achieving more effective methods of measuring characteristic Treaty-Limited Item (TLI) signatures (e.g. for non-deployed missiles and warheads in all phases, to include conversion and/or elimination) with technologies such as object and pattern recognition and micro-machined integrated neutron detectors and as well as providing monitoring/inspection capabilities to ultimately reduce cost and increase the flexibility of U.S. inspectors.

Develop technology to provide information collection, processing and dissemination capabilities required for compliance assessments and meet notification and reporting requirements associated with evolving treaties and agreements (e.g. new rules for counting strategic forces).

Develop technology to support revised implementation and compliance requirements resulting from the decisions of CFE's Joint Consultative Group; the OSCE's Forum for Security Cooperation; NATO's Verification Coordinating Committee and the High Level Task Force; the Conference on Disarmament; the Multilateral Working Group on Arms Control and Regional Security; the Wassenaar Arrangement; and the Open Skies Consultative Commission.

Perform technology assessments and provide technical input to support developing negotiating positions on APL and Small Arms/Light Weapons.

Perform technology assessments to support development of innovative agreements addressing arms control issues unique to a geographic region.

Prepare for implementation of the convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction (CWC), and for a new protocol under the Biological Weapons Convention (BWC). A primary objective is to develop and validate technologies that ensure on-site sampling and analysis is effective and that DoD equities are protected during the course of all inspections.

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Project BI - Arms Control Technology (cont'd)-

Develop technologies to synergistically support both the U.S. - Russian Chemical Weapons Bilateral Destruction Agreement, international peacekeeping efforts such as the UN Special Commission on Iraq and other non-proliferation initiatives.

Perform technology assessments and provide technical expertise to support DoD and U.S. policy makers and negotiators in determining the impact of proposed BWC inspection methodologies and requirements on DoD equities and in representing the U.S. during BWC Ad Hoc Group meetings.

Perform technical assessments of transparency measures considered as part of planned exchange visits among the US/UK/Russia, in accordance with the 1992 Trilateral Statement in order to resolve ambiguities in compliance with the BWC while promoting transparency of legitimate military BW defense programs.

Develop the nuclear test monitoring capability required to fulfill U.S. obligations under the CTBT as well as to independently monitor and detect nuclear test activities worldwide.

Develop prototype and transition the CTBT International Data Center (IDC) with the capability to acquire, archive, process, and analyze data from approximately 320 International Monitoring System (IMS) sensor stations positioned around the globe and to disseminate raw data products to all States Parties.

Develop, integrate, test, and evaluate an interface to the international CTBT organization to support routing of data between U.S. facilities and the CTBT IDC.

Conduct basic research in geophysical and physical phenomena that must be understood in order to meet current limited nuclear testing agreements' standards at decreasing cost over time, to enhance monitoring capabilities to detect treaty violators, and to provide high-confidence independent monitoring of nuclear activities required to protect national defense interests under a zero-yield CTBT.

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Project BI - Arms Control Technology (cont'd) -
FY 1999 Accomplishments

Technical Assessments (\$8,705K)

- Completed Ultraviolet Air Scintillation emerging technology laboratory experiment in cooperation with U.S. Army Space and Missile Defense Command.
- Completed START III Technology Planning Study to identify research areas for exploitation.
- Participated in the formation and organization of the Joint DOE/DoD Integrated Technology project.
- Co-chaired the Joint DOE/DoD Integrated Technology Working Groups on Radiation Technology, Remote/Unattended Monitoring Alternate Technology, and Tags/Seals. Actively participated in Steering Committee, Technology Assessment Working Group, Information Barriers Working Group, and Vulnerability and Security Analysis Working Group.
- Participated in Trilateral Initiative demonstration of Information Barrier technology.
- Initiated planning for a Joint DOD/DOE START III monitoring demonstration at DOE's Pantex Plant.
- Initiated Alternate Technology Working Group activities to survey, evaluate and select non-radiation-based alternatives for a potential START III transparency regime. Initiated Remote/Unattended Monitoring Working Group activities to evaluate and START III transparency regime.
- Initiated plenary discussions with Russian laboratories on cooperative research in strategic arms control monitoring.
- Identified options for modifying the ABM treaty to accommodate Theater Missile Defense (TMD) and National Missile Defense (NMD) deployment.
- Designed a software architecture for an integrated Arms Control Information Notification System (ACINS) that complies with all DoD software directives.
- Assessed the technological impact of ABM Treaty-related limitations on the target missile during TMD testing and its effect on TMD development.

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Project BI - Arms Control Technology (cont'd) -

Provided technical support for START, START II and START III negotiations.
Assessed various technology options to support the U.S. delegations to the Open Skies Consultative Commission (OSCC), the Joint Consultative Group and CFE Adaptation, the Forum for Security Cooperative and the APL, Small Arms/Light Weapons (SA/LW) and regional arms control negotiations.
Provided treaty compliance assessments and planning support to OUSD(AT&L)/ACI&C.
Assessed technology requirements of potential regional arms control initiatives for the Asia-Pacific Rim and Latin America.
Initiated performance evaluations of current Open Skies sensors.
Completed infra-red (IR) and video sensor technology assessments and developed operational requirements supporting Open Skies.
Monitored Open Skies sensor data acquisition, reduction and analysis to support Open Skies negotiations.
Expanded the Arms Control Technology Reference and Display Center to include new promising arms control technologies.
Completed Y2K testing of CMTS host; upgraded CMTS host operating system to Solaris 2.6.
Initiated assessments of technologies potentially applicable to wide-area detection (WAD) of APL minefields.
Completed proof-of-concept and data collection on advanced non-destructive evaluation technology concept (ultrasonic remote assay of munitions (URAM)).
Provided technical support to CW Treaty Manager, OSD Policy and Army in preparation for CWC Executive Council Sessions and the Conference of States Parties.
Participated in Organization for the Prohibition of Chemical Weapons (OPCW) technical working groups, including those involving analytical data base spectral validation and on-site analytical procedures, to identify data gaps.
Initiated vapor testing of minicams for lewisite detection.
Delivered updated CW treaty reference collection.
Completed independent testing and validation of rapid CW microspot screening kit.

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Project BI - Arms Control Technology (cont'd) -

Updated BW History Database, archived relevant historical documents, and initiated inclusion of current Biological Defense Program information into the Data base. Provided technical support during BWC bilateral discussions with Allies and negotiations at the 15th BWC Ad Hoc Group meeting in Geneva. Provided technical analysis and vulnerability assessments on implementing the BWC Protocol.

Identified information processing requirements and data management techniques to satisfy potential reporting requirements under the BWC.

Identified CTBT implementation and compliance issues.

Developed the types of information to be presented to policy and decision makers in support of interagency and international groups.

Studied DoD vulnerability under the Strengthened Safeguards System protocol (S3P).

Technology Development (\$48,463K)

Completed development of a room temperature, moderate-resolution, hand-held cadmium-zinc-telluride radiation detector.

Initiated Radiation Technology Working Group activities to evaluate radiation detectors and select medium and high-detection systems for use in a potential START III transparency regime.

Initiated Remote/Unattended Monitoring Working Group activities to evaluate START III transparency regime.

Initiated Tags/Seals Working Group activities to survey, evaluate and select tags and seals alternatives for use in a potential START III transparency regime.

Initiated Phase II SBIR effort to develop a portable gamma camera able to provide both spatial and energy resolution.

Ensured that the Comprehensive Monitoring and Tracking System complied with all Y2K requirements.

Continued development of a standard digital format for Open Skies digital sensors data.

Completed planned Open Skies Management & Planning System (OSMAPS) baseline updates, modifications and independent validation and verification (IV&V) of software.

Completed OSMAPS Y2K certification.

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Project BI - Arms Control Technology (cont'd) -

Conducted IV&V of arms control information processing(IP)software.
Continued development of the Regional Inspection Simulation Tool(RIST).
Demonstrated developmental system at U.S. State Department and DTRA Arms Control Conference.
Continued development of Theatre Site Equipment Identification Module for CMTS and delivered copies to EUCCOM, USAFE, USAEUR, and DTRA activities.
Demonstrated prototype Microbial Mine Detection System (MMDS).
Initiated Microwave Radar Algorithm (MRA) effort for WAD and mapping of APL minefields.
Completed Chemical Accountability Management Information Network (CAMIN) development; certified system as Y2K compliant and transferred system to the Army.
Completed hardened field version of Swept Frequency Acoustic Interferometry instrument for non-destructive evaluation and demonstrated the technology in several Government and public venues.
Completed development of prototype mini-Portable Isotopic Neutron Spectroscopy instrument.
Completed alpha testing of Automated Mass Spectral Deconvolution Identification System (AMDIS) and modified software to include chemical class and retention indices.
Developed an on-line BW-related historical developed to provide OSD(P) with search and retrieval capability.
Conducted an initial test of a new data management technique to satisfy current BWC Confidence Building Measures and potential reporting requirements under the CWC.
Developed a database on US DoD Bio-defense Facilities to assist negotiators at Ad Hoc meetings to assess US DoD vulnerabilities and to identify impacts of proposed inspection methodologies.
Developed a data management system of BWC-related reference material ("Agents of Biological Origin Database").
Maintained and operated existing IMS stations to support development of prototype IDC.
Continued IMS station certification with CTBT Organization.

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Project BI - Arms Control Technology (cont'd) -

Upgraded two primary seismic stations to CTBT standards.
Integrated proven seismic, hydroacoustic, infrasound, and radionuclide data exploitation techniques into the automated and interactive systems.
Continued transition of the prototype International Data Center (IDC) systems (Version 2) to the international CTBT organization.
Performed Y2K remediation on all software systems.
Validated prototype IDC for conducting initial operational testing and evaluation.
Developed upgrades to increase the prototype IDC capability to support on-going R&D.
Continued the development of U.S. Multi-casting Data Routing protocol and interface with the IDC.
Continued to develop computerized, rapidly-executing techniques and algorithms to detect, locate, and identify seismic, acoustic and radionuclide signals from operational sensor systems.
Continued research and development to improve understanding of source phenomenology and propagation for nuclear treaty-relevant events near detection threshold and to enhance detection, location, screening, and identification of seismic, oceanic, and atmosphere events. Complied with Congressional emphasis on supporting nuclear treaty verification and compliance.
Developed the types of information to be presented to policy and decision makers in support of interagency and international groups.
Developed cost-effective techniques for arms control related databases.
Continued and accelerated the industry-based nuclear detection analysis systems development in compliance with Congressional emphasis.

FY 2000 Plans

Technical Assessments (\$ 8,775K)

Assess and document threats to a potential START III verification technology suite and develop common threat definitions for technology evaluation purposes.
Evaluate requirements for upgrades to Votkinsk continuous monitoring system for START following INF monitoring conclusion in FY01.
Initiate effort to extract lessons-learned from START and INF for use in negotiating future arms control regimes.

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Project BI - Arms Control Technology (cont'd) -

Initiate Space Arms Control Technology Assessment to support DoD analysis and evaluation of potential space arms control measures and their need for verification technology developments.

Assess the technological impact of multilateral strategic verification regimes. Execute an adversarial analysis of options for modifications to the ABM treaty to accommodate Theater Missile Defense (TMD) and National Missile Defense (NMD) deployment.

Assess requirements for a START III inventory, monitoring, and notification system as part of Arms Control Information and Notification System (ACINS).

Complete a Regional Verification Technology Study on technologies suitable for monitoring strategic treaties in the Middle East.

Provide technical negotiation support for START, START II and START III.

Assess various technology options to support the U.S. arms control delegations to NATO, OSCE, the Joint Consultative Group, the Forum for Security Cooperation, and the APL, Small Arms/Light Weapons (SA/LW), and regional arms control negotiations.

Provide treaty compliance assessments and planning support to OUSD(AT&L)/ACI&C.

Provide requisite technical assessments for Open Skies, APL, CCW and SA/LW treaties/negotiations.

Continue Open Skies sensor performance evaluations, provide optical camera assessment, and provide acquisition support for IRLS and video camera.

Initiate assessment of potential utility of aerial monitoring and inspection overflights as a tool to support verification efforts of multiple treaties, including CFE, CTBT, and environmental agreements.

Initiate assessment of OSMAPS life-cycle upgrade.

Assess technology requirements of potential regional arms control initiatives in the Middle East.

Review rapid gas chromatograph (GC), with new detectors and other alternative technologies for determinative CWC-related sample analysis.

Evaluate Surface Acoustic Wave (SAW) devices, ionmobility spectroscopy devices for sample screening applications.

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Project BI - Arms Control Technology (cont'd) -

Assess impact of CWC inspection/monitoring technologies and methodologies on DoD facilities and agencies.

Evaluate assets and vulnerabilities relative to potential challenge inspections.

Update BW History on-line database.

Provide technical support to OSD(P) during BWC protocol negotiations and potential Preparatory Commission (PrepCom) activity.

Continue providing technical analysis and vulnerability assessments on implementing the BWC Protocol.

Conduct analyses and assessments of selected CTBT implementation and compliance issues.

Technology Development (\$ 64,753K)

Conduct a Joint DoD/DOE START III monitoring demonstration at DOE's Pantex Plant for the Interagency Working Group.

Initiate adaptation projects for technologies identified by Alternate Technology Working Group for non-radiation based alternatives for a potential START III transparency regime.

Explore possibilities of electromagnetic coil instruments to characterize Special Nuclear Material (SNM) in containers.

Investigate potential for an infrared sensor to detect warheads by detecting the high explosives within the warhead.

Develop technology for nuclear material detection, analysis, and forensics systems assessments.

Initiate effort to investigate applications of ultrasonic interferometry technique (originally developed for Chemical Weapons Convention use) to strategic arms control monitoring.

Initiate an effort to automate the presentation of Russian and U.S. nuclear weapons system life cycles in support of treaty negotiations.

Initiate contracts with Russian laboratories to accomplish cooperative research in Russia on strategic arms control monitoring.

Continue Phase II SBIR effort to develop a portable gamma camera able to provide both spatial and energy resolution.

Initiate development of a software tool to automate compliance assessments of

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Project BI - Arms Control Technology (cont'd) -
potential TMD systems with respect to the ABM treaty. Initiate development of an integrated Arms Control Information Notification System (ACINS) that complies with all DoD software directives. Deliver Full Operational Capability (FOC) version of OSMAPS. Begin proof-of-concept of follow-on technologies to support implementation and compliance with the future APL agreements. Refine MMDS approach. Deliver prototype MRA software to detect and discriminate non-metallic APL. Complete development of the RIST system and deploy IOC system to the Middle East with specific training modules, as required. Integrate FOC of VERITY Treaty-Limited Equipment (TLE) Search System to identify international sites and assets within a defined area. Conduct APL sensor demonstrations for the purpose of APL treaty applications. Develop enhanced time-efficient sample screening methods for on-site CWC inspections. Integrate inspection methods and equipment to optimize throughput of CWC-related samples, utilizing commercial off-the-shelf (COTS) equipment. Continue development of follow-on non-destructive evaluation (NDE) capabilities for standoff chemical munition classification, identification, and quantification. Conduct technology integration for on-site BWC-related analytical equipment and Methodologies. Test and evaluate to assess operational performance, environmental durability, safety and overall effectiveness. Develop a distributed DoD data management system for compiling and submitting BWC declarations. Continue test and evaluation of IMS primary seismic stations in support of the Prototype International Data Center. Initiate test and evaluation of prototype IMS auxiliary seismic stations. Initiate prototype development of IMS radionuclide sensors. Continue certification of IMS monitoring stations. Continue transition of the prototype IDC systems with delivery of version 3 software to the International CTBT Organization. Conduct validation of operational test and evaluation of software releases for IDC systems.

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Project BI - Arms Control Technology (cont'd) -

Develop upgrades to increase the prototype IDC capability to support on-going R&D. Continue research and development efforts in support of the CTBT National Authority and National Data Center and integrate enhanced tools. Initiate location calibration research for IMS seismic stations. Continue development of cost-effective computerized, rapidly executing techniques and algorithms to detect, locate, and identify seismic, acoustic and radionuclide signals from operational sensor systems. Continue research and development to improve understanding of source phenomenology and propagation for nuclear treaty-related events near detection threshold and enhance detection, location, screening and identification of underground, oceanic, and atmospheric events through a peer-reviewed program of basic research. Expand the basic and applied research in support of nuclear test detection in compliance with Congressional emphasis. Conduct analysis and assessments of selected CTBT implementation and compliance issues. Develop decision making tools for policy and decision makers to support interagency and international groups. Continue the industry-based development of nuclear detection sensors and analysis technology in compliance with Congressional emphasis.

FY 2001 Plans

Technical Assessment (\$8,931K)

Complete effort to extract lessons-learned from START and INF for use in negotiating future arms control regimes. Provide technical negotiation support for START, START II and START III. Assess various technology options to support the U.S. arms control delegations to NATO, OSCE, the Joint Consultative Group, the Forum for Security Cooperation, the APL, Small Arms/Light Weapons (SA/LW), and regional arms control negotiations. Complete assessment of aerial monitoring for treaty verification and confidence building. Continue performance evaluation of Open Skies sensors and recommend enhancements as needed.

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Project BI - Arms Control Technology (cont'd) -

Assess follow-on Synthetic Aperature Radar (SAR) system and provide acquisition RDT&E support for the Open Skies aircraft optical cameras, video camera and IRLS.

Assess integrated system feasibility of stand off APL detection and mapping.

Assess CFE treaty technical needs based on historical performance of inspections to support CFE Review Conference (REVCON).

Conduct OSMAPS life-cycle and mission needs planning.

Complete Final Report on Regional Area Technical Assessment for the Middle East.

Conduct assessment of information processing (IP) needs for an APL ban.

Define user and system software requirements for next generation of CWC-related analytical equipment.

Evaluate advanced Mass Spectrometry technology for CWC-related applications.

Evaluate implications and consequences for DoD of potential changes to the CWC Review Conference (REVCON).

Provide technical support to OSD(P) in preparation for BWC Review Conference (REVCON).

Conduct analyses and assessments of selected CTBT implementation and compliance issues.

Technology Development (\$43,186K)

Complete Phase II SBIR effort to develop a portable gamma camera able to provide both spatial and energy resolution.

Complete development of a software tool to evaluate compliance of a potential TMD system with the ABM treaty.

Continue development of an integrated ACINS that complies with all DoD software directives.

Plan and execute a START III monitoring regime demonstration at the Pantex Plant for representatives from the Russian Federation.

Complete effort to investigate applications of ultrasonic interferometry technique (originally developed for Chemical Weapons convention use) to strategic arms control monitoring.

Initiate the development of an extended digital processor to process foreign digital sensor data to ensure treaty-required resolution of foreign sensors used in overflights of the U.S.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA3	R-1 ITEM NOMENCLATURE Arms Control Technology; 0603711BR	

Project BI - Arms Control Technology (cont'd) -

Begin development of an aerial monitoring system applicable to multiple treaties and agreements.

Continue development of the next generation of treaty support information management systems, Arms Control Information and Notification System (ACINS), using state-of-the-art technologies and adhering to DoD standards.

Initiate development of OSMAPS life-cycle upgrades and perform IV&V as required.

Complete development of VERITY TLE Search System and deliver final documentation and source code.

Continue deployment and adaptation of RIST and required training modules.

Initiate development of Gas Chromatography/Mass Spectrometry (GC/MS) follow-on technology capable of determinative analysis.

Continue testing and evaluating inspection equipment for performance, ruggedness, safety, and effectiveness.

Develop alternative technologies for determinative CWC-related sample analysis.

Revise and enhance on-site BW determinative sample analysis technologies and methodologies based on BWC PrepCom requirements.

Update a distributed DoD data management system for compiling and submitting BWC declarations based on PrepCom requirements.

Test and evaluate on-site analytical equipment and methods to assess their efficacy and efficiency based on BWC PrepCom and anticipated REVCON requirements.

Complete test and evaluation of Wake Island IMS prototype digital infrasound station.

Complete test and evaluate prototype IMS auxiliary seismic stations.

Prototype new hydroacoustic technology at Wake Island IMS station.

Complete prototype IMS radionuclide sensors.

Complete certification of IMS monitoring stations.

Complete transition of the prototype IDC systems (Version 4) to the International CTBT Organization.

Continue development of the next generation of treaty support information management systems (ACINS) using state-of-the-art technologies and adhering to DoD standards.

Validate results of operational test and evaluation of software releases for IDC Systems.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA3	R-1 ITEM NOMENCLATURE Arms Control Technology; 0603711BR	

Project BI - Arms Control Technology (cont'd) -

Develop upgrades to increase the prototype IDC capability to support on-going R&D. Continue research and development efforts in support of the CTBT National Authority and National Data Center.

Provide technical support to the CTBT National Authority as events require.

Continue research on location calibration of IMS for seismic events.

Continue development of cost effective computerized, rapidly executing techniques and algorithms & detect, locate, and identify seismic, acoustic and gases signals from operational sensor systems.

Continue research and development to improve understanding of source phenomenology to detect, locate, and identify seismic, acoustic and radionuclide signals from operational sensor systems.

Continue research and development to improve understanding of source phenomenology and propagation for nuclear treaty-related events near detection threshold and enhance detection, location, screening, and identification of underground, oceanic, and atmospheric events through a peer-reviewed program of basic research.

Conduct analysis and assessments of selected CTBT implementation and compliance issues.

Develop decision making tools for policy and decision makers to support interagency and international groups.

Develop more cost-effective techniques for arms control related databases.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/Advanced Technology Development - BA3	R-1 ITEM NOMENCLATURE Arms Control Technology; 0603711BR	

B. <u>Program Change Summary</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>
Previous President's Budget	57.3	58.5	55.3
Current Budget Submit	57.2	73.5	52.9

Change Summary Explanation:

In an effort to better focus the Agency organization and resources to the threat reduction mission, realignment of predecessor agencies' legacy programs and support baselines into an integrated DTRA program and resource structure has occurred. This budget request is reflective of this integrated DTRA program construct.

Changes in FY 2000 are attributable to compliance with Congressional emphasis in the areas of nuclear detection analysis and basic and applied research to support nuclear testing.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE February 2000	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6					R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR			
COST (In Millions)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete
Total 0605110BR Cost	2.6*	2.2	3.9	2.2	2.2	2.2	2.3	Continuing
Project BB - Small Business Innovative Research (SBIR)	0	0	.1	.1	.1	.1	.1	Continuing
Project BL - Militarily Critical Technology Program	2.6*	2.2	3.8	2.1	2.1	2.1	2.2	Continuing

*Funding and activities were accomplished under PE 0605110T. The DCSA reimbursed DTRA for FY 1999 activities.

A. Mission Description and Budget Item Justification - This program element supports development and publication of the Congressionally mandated Militarily Critical Technologies List (MCTL). The MCTL is the fundamental source document for identification of leading edge and current technologies which must be monitored and assessed world-wide for national security and nonproliferation control of weapons of mass destruction and advanced conventional weapons. Efforts encompass:

- Continuous technical support to interdepartmental and international processes which develop multinational control agreements on technologies of concern to DoD.
- Worldwide technology assessments for the MCTL and other critical technologies efforts.
- Identification and determination of technical parameters for proposals for international control of weapons of mass destruction.
- Technical assessments to support treaty compliance inspections and decisions on foreign ownership of US industrial assets.
- Identification of foreign technologies of interest to the DOD and opportunities for international cooperative research and development.

RDTE&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDTE&E, Defense-Wide/RDTE&E Management Support - BA6		R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR

A. Mission Description and Budget Item Justification (cont'd) - During its first year of operation, DTRA has faced many challenges in the process of focusing agency organization and resources to the threat reduction mission. This has required a transition from predecessor agencies' legacy programs and support baseline resources to integrated DTRA programs and resources. Particular attention has been devoted to realigning the research and development investment programs. This project includes funding for travel by DTRA personnel in support of the management and technical objectives. The project structure in this PE represents that realignment.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6		R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR

Project BB - Small Business Innovative Research (SBIR) - This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of DoD supported research and development results. These efforts are responsive to PL 102-564.

FY 2001 Plans

Small Business Innovative Research (\$99K)

Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative research.

Execute Agency-approved SBIRs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6		R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR

Project BL - Militarily Critical Technologies Program - This project is responsive to a Congressional mandate to identify and develop a list militarily critical technologies and to satisfy time critical requirements for transfer and control of technologies established in interdepartmental and international processes.

FY 1999 Accomplishments

*Funding and activities were accomplished under PE 0605110T. The DCSA reimbursed DTRA for FY 1999 activities.

Developed and published MCTL Part III, Section 3, Biological Technology; Technology Working Group Handbook and Membership List; The Development of MCTL Part II, Weapons of Mass Destruction Technologies; Internet Usage.

Developed and published a classified addendum to MCTL Part II on Theater Ballistic Missiles.

Designed and implemented a revised MCTL web page.

Provided on site support at international technology negotiations and analyzed and documented US and International Participation.

FY 2000 Plans

Develop and publish updated MCTL Parts I, II and III in both hard copy and electronic versions incorporating results of the assessments completed in FY 1999 and changes in multinational control regimes. (\$1,116K)

Monitor and assess dual use and military technologies worldwide and develop technology assessments to support national military and economic security actions and identify candidate technologies for applications in U.S. weapon systems. These assessments will reflect security concerns, effects of the proliferation of weapons of mass destruction and the rapid advancement of technology worldwide. (\$982K)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6		R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR

Project BL - Militarily Critical Technology Program (cont'd) -
FY 2000 Plans (cont'd) -

Develop proposals for international control/decontrol of technologies for multinational negotiations for the Wassenaar Arrangement, Nuclear and Biological Warfare/Chemical Warfare (BW/CW) export control regimes. (\$100K)

FY 2001 Plans

Develop and publish updated MCTL Parts I, II and III in both hard copy and electronic versions incorporating results of the assessments completed in FY 2000 and changes in multinational control regimes. (\$1,080K)

Monitor and assess dual use and military technologies worldwide and develop technology assessments to support national military and economic security actions and identify candidate technologies for applications in US weapon systems. These assessments will reflect security concerns, effects of the proliferation of weapons of mass destruction and the rapid advancement of technology worldwide. (\$900K)

Develop proposals for international control/decontrol of technologies for multinational negotiations for the Wassenaar Arrangement, Nuclear and Biological Warfare/Chemical Warfare (BW/CW) export control regimes. (\$100K)

Develop analytical tools to aid in evaluation and assessment of technology and goods for national security. (\$1,748K)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Critical Technology Support; 0605110BR	

B. Program Change Summary

	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>
Previous President's Budget	2.6*	2.2	2.1
Current Budget Submit	2.6*	2.2	3.9

*Funding and activities were accomplished under PE 0605110T. The DCSA reimbursed DTRA for FY 1999 activities.

Change Summary Explanation:

Increased funding in FY 2001 supports the development of analytical tools to aid in evaluation and assessment of technology and goods for national security.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE	
							February 2000	
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				
RDT&E, Defense-Wide/RDT&E Management Support - BA6				Counterproliferation Support; 0605160BR				
Cost (In Millions)	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete
Total 0605160BR Cost	9.1	5.3	0.0	0.0	0.0	0.0	0.0	Realigned
Project P542 CP Architecture Studies and Management Oversight	7.1	5.3	0.0	0.0	0.0	0.0	0.0	Realigned
Project P545 Nuclear Matters	2.0	0.0	0.0	0.0	0.0	0.0	0.0	Transferred

A. Mission Description and Budget Item Justification - In August 1994, DoD established the Counterproliferation Support Program specifically to address the DoD shortfalls in counterproliferation operational capabilities documented in the May 1994 Report to Congress titled *Report on Nonproliferation and Counterproliferation Activities and Programs*. Counterproliferation Support Program funds were designed to leverage DoD acquisition programs to meet the counterproliferation priorities of the Commanders-in-Chief (CINCs) of the Combatant Commands and accelerate deployment of enhanced capabilities to the field. Specifically, the goal of the Counterproliferation Support Program was to improve specific military counterproliferation capabilities by (1) building on ongoing programs in the Services, DoD agencies, Department of Energy and US Intelligence; (2) focusing on the most critical counterproliferation shortfalls to address major gaps in deployed capabilities (as reflected in the CINCs' priorities and the Counterproliferation Review Committee's (CPRC) prioritized list of counterproliferation Areas for Capability Enhancement); (3) leveraging existing program funding to more rapidly field capabilities by accelerating the deliverables of DoD programs; (4) identifying and enhancing development of high payoff technologies to accelerate capabilities to the warfighter; (5) identifying and promoting key non-material initiatives that complement technological advances; (6) transitioning Counterproliferation Support Program projects to the Services as soon as practicable; and (7) procuring counterproliferation unique development products for the CINCs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Counterproliferation Support; 0605160BR	

A. Mission Description and Budget Item Justification (cont'd) -

Counterproliferation (CP) is the activity in DoD to combat the spread of nuclear, biological, and chemical (NBC) weapons and their means of delivery. Activities include arms and export control, intelligence collection and analysis, counterforce, active defense, passive defense, and consequence management. Effective in October 1998, DoD created a single agency, the Defense Threat Reduction Agency (DTRA), which is responsible for all the counterproliferation activities except active defense and intelligence. The DTRA now manages the former Counterproliferation Support Program. Focusing counterproliferation activities in DTRA will improve integration and further leverage warfighter capabilities. The funds in this program element support requirement identification; monitoring the technology base for exploitation; oversight/management for the Counterproliferation Support Program; studies and technical analyses to determine the best combination of technologies, acquisition programs, doctrine and concepts of operation to provide CINCs' required capabilities; and CP investment strategy (master plan) development.

During its first year of operation, DTRA faced many challenges in the process of focusing agency organization and resources to the threat reduction mission. This has required a transition from predecessor agencies' legacy programs and support baseline resources to integrated DTRA programs and resources. Particular attention has been devoted to realigning the research and development investment programs. The projects in this PE have been realigned in FY 2001.

To better support the DTRA program and resource structure, a new program element (PE) code construct has been designed and approved.

After FY 2000, Project 542, CP Architecture Studies and Management Oversight, is realigned to Project BK in PE 0603160BR.

After FY 1999, Project 545, Nuclear Matters, is transferred to Director, Defense Research and Engineering (DDR&E) where the management responsibilities remain.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Counterproliferation Support; 0605160BR	

Project P542 - Counterproliferation Architecture Studies and Management/Oversight - The Defense Threat Reduction Agency (DTRA) has been designated by the Secretary of Defense as the focal point for counterproliferation (CP) activities. The CP Program provides this focus of activities within the DoD. This project provides essential technical, architectural and integration support to the CP Program. The project will (1) conduct analyses and planning activities necessary for program development, project prioritization and management oversight; (2) prepare required program deliverables such as the annual CP Report to Congress and internal DoD and interagency documents; and (3) provide technical and analytical support to the established CP review groups, including the Congressionally mandated Counterproliferation Program Review Committee (CPRC). This project provides critical support to the DTRA for conducting the day-to-day operations of the CP Program and in providing necessary management oversight.

FY 1999 Accomplishments

Warfighters' CP requirements (\$3,360K)

Identified and integrated warfighters' CP requirements.

Developed and maintained a CP master plan for DoD.

Supported CP technical analyses and technical program oversight.

Coordinated CP interagency program and integrated activities (CPRC, Nonproliferation and Arms Control Technology Working Group).

Delivered the CPRC Annual Report to Congress.

Participated in CINC exercises to demonstrate value added from new CP capabilities.

Supported OSD and Joint Staff analysis for NBC weapons effects on a U.S. campaign.

CP architectural studies and technical assessments (\$3,741K)

Conducted trade-off analyses of contributions of selected DoD acquisition efforts to DoD counterproliferation capabilities.

- Assessed technology needs to enable U.S. forces to engage and defeat potential adversaries who proliferate NBC weapons.
- Assessed hard target kill technologies including mission planning tools, battle damage assessment and intelligence preparation of the battlefield.
- Assessed first responder/Special Operations Forces (SOF) CP technology needs.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Counterproliferation Support; 0605160BR	

Project P542 Counterproliferation Architecture Studies and Management/Oversight (cont'd) -
 Monitored the technology base for exploitation.
 Supported the warfighter by identifying non-material solutions and delivering material solutions to required CP capabilities.
 Defined and planned for new advanced concept technology demonstrations to meet CINC needs.
 Continued CP Capabilities Working Group.

FY 2000 Plans

Warfighters' CP requirements (\$2,622K)

Maintain a CP master plan for DoD.

Support CP technical analyses and technical program oversight.

Coordinate CP interagency program and integrate activities (CPRC, Nonproliferation and Arms Control Technology Working Group).

Deliver the CPRC Annual Report to Congress.

Participate in CINC exercises to demonstrate value added from new CP capabilities.

CP architectural studies and technical assessments (\$2,649K)

Conduct trade-off analyses of contributions of selected DoD acquisition efforts to DoD counterproliferation capabilities.

- Assess new Service technology areas to support CP activities.

- Assess CP technologies for exploitation and inclusion in the CP master plan.

Monitor the technology base for exploitation.

Support the warfighter by identifying non-material solutions and delivering material solutions to required CP capabilities.

Define and plan for new advanced concept technology demonstrations to meet CINC needs.

Continue CP Capabilities Working Group.

FY 2001 Plans

Funding and activities realigned to Project BK in PE 0603160BR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Counterproliferation Support; 0605160BR	

Project P545 - Nuclear Matters - Nuclear weapons receive special consideration within OSD because of political and military importance, destructive power and potential consequences of an accident or an unauthorized act. Consequently, nuclear weapons issues must receive senior level attention and action/support. Complex and demanding issues exist pertaining to stockpile levels and stockpile maintenance and stewardship in collaboration with the Department of Energy, especially in view of an aging stockpile and the moratorium on underground nuclear testing. Project 545 provides support for analysis and assessments of issues associated with the reliability, safety, security, transportation, command and control, maintenance, storage and sustainability of the enduring stockpile.

FY 1999 Accomplishments

Nuclear Matters (\$2,012K)

- Provided DoD oversight of DOE stockpile stewardship activities.
- Supported Nuclear Weapons Council.
- Supported activities of CP to combat international terrorism and proliferants.
- Supported DoD policy formulation on nuclear weapons safety, use control, survivability, certification, transportation and reliability.
- Completed analyses and supported activities for senior level advisory groups.

FY 2000 Plans

Funding and activities transferred to PE 0605160D8Z.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide/RDT&E Management Support - BA6	R-1 ITEM NOMENCLATURE Counterproliferation Support; 0605160BR	

B. <u>Project Change Summary</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>
Previous President's Budget	9.3	5.3	4.6
Current President's Budget	9.1	5.3	0
Change Summary Explanation:			

As part of DTRA's efforts to better focus the Agency organization and resources to the threat reduction mission, funds for Project P542, CP Architecture Studies and Management Oversight, were realigned to PE 0603160BR in FY 2001.

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THE JOINT STAFF

February 2000



Fiscal Year (FY) 2001

Budget Estimate

Research Development Test & Evaluation (RDT&E)

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PROGRAM ELEMENT COMPARISON SUMMARY

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PROGRAM ELEMENT

REMARKS

BUDGET ACTIVITY 4: ADVANCED TECHNOLOGY DEVELOPMENT

0603857J, All Service Combat Identification Evaluation Team (ASCIET)	Fiscal year (FY) 1999 was the first year for Joint Staff RDT&E funding. The funding for FY 2000 – FY 2005 has transferred to the Joint Forces Command (Navy is the Executive Agent) as directed by the Defense Reform Initiative Directive (DRID) 29.
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BUDGET ACTIVITY 6: JOINT ATTACK OPERATIONS

0605126J, Joint Theatre Air and Missile Defense Organization (JTAMDO)	FY 1999 reflects a congressional increase in appropriations. Again, in FY 2000 Congress provided an increase in funding. These funds were transferred to the Navy electronic warfare program, which is responsible for program execution. FY 2001 reduction reflects a transfer of funds to the Joint Simulation System (JSIMS) program to meet initial operational capability (IOC) date of April 2001. The increased funding from FY 2001 through FY 2005 is to establish a Joint Distributed Engineering Plant (JDEP). The Joint Distributed Engineering Plant's objective is to improve interoperability of weapons systems and platforms through more rigorous testing and evaluation in a replicated battlefield environment.
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BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT

0208052J, Joint Analytical Model Improvement	Program supports development of the Joint Warfare System (JWARS)
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PROGRAM ELEMENT COMPARISON SUMMARY

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PROGRAM ELEMENT

REMARKS

Program (JAMIP)

model. Over FYs 2001 through 2005, JAMIP has realigned Operations and Maintenance funding to Research and Development funding as a result of information technology budgeting policy clarification and to comply with House Appropriations Committee guidance (Report 106-244). Over FY 2001 through 2005, JAMIP also received additional funding to maintain the current Joint Data System (JDS), JWARS, and Simulation Analysis Center (SAC) levels of effort and to continue the Joint Data System (JDS) support for future Quadrennial Defense Reviews. Joint Warfare System (JWARS) will be the campaign simulation used to assess the impact of Command, Control, Communications, Computers and Intelligence (C4I) Surveillance and Reconnaissance (C4ISR) on battle outcomes and JDS will manage the data. The Simulation Analysis Center (SAC) supports JWARS operational testing and will also use JWARS to conduct assessments that support major Defense reviews.

0303149J, C4I for the Warrior (C4IFTW)

Provides for network-centric operations along with the implementation of the global information grid. These programs promote joint coalition Command, Control, Communications, Computers and Intelligence (C4) interoperability worldwide. Over fiscal years 2001 through 2005, Command, Control, Communications, Computers and Intelligence for the Warrior (C4IFTW) received increased funding for Network Warfare Simulation (NETWARS). The NETWARS model assesses the effects of full operational combat traffic load on current and future tactical

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PROGRAM ELEMENT COMPARISON SUMMARY

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<u>PROGRAM ELEMENT</u>	<u>REMARKS</u>
0902298J, Joint Warfighting Capabilities Assessment (JWCA)	communications systems and networks in a Joint Task Force Major Theater of war scenario. Funds studies that support the Joint Staff directorates, Secretary of Defense and the CINCs with directives received from the Joint Requirements Oversight Council (JROC).
0902298J, C4 Systems Support	Increase due to realignment of Satellite Communications (SATCOM) program from O&M to the RDT&E appropriation to comply with recent DoD clarification letter on Budgeting for Information Technology and Automated Information Systems.
0902298J, Joint Staff Information Network (JSIN)	Over fiscal years 2001 through 2005, the Joint Staff Information Network (JSIN) has realigned Operations and Maintenance funding to Research and Development funding as a result of Information Technology budgeting policy clarification and to comply with House Appropriations Committee guidance (Report 106-244). This realignment is projected to fund a four year cycle for refreshing Joint Staff Actions Processing software (JSAP).
0902740J, Joint Simulation System	FY 2001 increase includes a transfer of funds to meet IOC date.

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**THE JOINT STAFF
FY2001 BUDGET ESTIMATES
RDT&E PROGRAMS
\$ IN MILLIONS**

PROGRAM ELEMENT	TITLE	BUDGET ACTIVITY	BUDGET			
			FY 1999	FY 2000	FY 2001	FY 2002
0603857J	All Service Combat Identification Evaluation Team (ASCIET)	4	12.914	0.000	0.000	0.000
0605126J	Joint Theater Air & Missile Defense Organization (JTAMDO)	6	109.079	17.384	21.200	26.865
0208052J	Joint Analytical Model Improvement Prog (JAMIP)	7	.833	1.012	11.941	12.163
0303149J	C4I for the Warrior (C4IFTW)	7	2.798	2.982	5.486	5.935
0902298J	Management Headquarters (JWCA)	7	9.287	9.220	9.496	10.567
0902298J	Management Headquarters (C4 Systems Support)	7	0.000	0.000	1.950	1.957
0902298J	Management Headquarters (JSIN)	7	0.000	0.000	1.094	.745
0902740J	Joint Simulation System (JSIMS)	7	24.564	18.369	24.095	17.862
TOTALS			159.475	48.967	75.262	76.094

Exhibit R-2, RDT&E Budget Item Justification									Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 4					R-1 ITEM NOMENCLATURE Program Element 0603857J All Service Combat Identification Evaluation Team (ASCIET)					
COST (\$ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost	0	12.914	0	0	0	0	0	0	Continuing	Cont
<p>A. Mission Description and Budget Item Justification</p> <p>The All Service Combat Identification Evaluation Team (ASCIET) transferred to the Joint Staff during FY 1998. ASCIET was formed from the OSD-Sponsored Joint Air Defense Operations/Joint Engagement Zone (JADO/JEZ) Joint Test and Evaluation Program conducted during FY 1990 through FY 1994. JADO/JEZ tested the ability of Service forces to execute an effective air defense network in a joint tactical environment. In December 1993, the Joint Requirements Oversight Council (JROC) directed that the JADO/JEZ Program transition to the ASCIET Program on 1 October 1994. Per Defense Reform Initiative Directive 29, ASCIET will transfer to the US Atlantic Command (Navy is the executive agent in FY 2000. ASCIET is an expanding effort aimed at fostering improved tactics, techniques and procedures (TTP) across all combat identification (CID) mission areas. ASCIET is chartered to employ the equipment and personnel of all Services to evaluate, investigate, and assess various concepts of combat identification on the battlefield. The US Air Force is the lead Service. ASCIET also offers federally funded research and development centers (FFRDCs), Service battle laboratories, and industry the opportunity to review and evaluate emerging technologies in a multi-Service environment on a not-to-interfere basis as a risk reduction and verification opportunity during ASCIET evaluations. Requirements and resources for FY 1998 come from Navy PE 0604777N, Army PE 0604817A, Marine PE 0206623M, Air Force PE 0207417F. This program is in budget activity 4 which includes efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology.</p> <p>ASCIET's efforts to evaluate, document, and report on CID capability are a critical force enabler and a Department priority. Perceived inaction on ASCIET-identified deficiencies in CID has forced changes in the command and control of the ASCIET organization. During FY 1998, the organization was moved under the Joint Staff to ensure a coordinated, synergistic approach for improving warfighting capability into the 21st century. By evaluating interoperability, technology application and development, and training, the new organization will provide the means to efficiently assess ground, air, and maritime force capabilities; determine future requirements; develop new systems; and develop a program for long-term procurement. (From inception through FY 1998, ASCIET has been funded annually by all four Services through a Memorandum of Agreement.)</p> <p>The ASCIET staff was directed by the General Officers' Steering Committee-Combat Identification (GOSC-CI), in the summer of FY 1997, to conduct joint Service site surveys to find an operational area that better supports all four Services/CINC mission area objectives, supports evaluation of all four combat ID mission areas simultaneously, and can be fully instrumented to record data. In March of 1998, the JROC selected FT Stewart/East Coast as the ASCIET 99 evaluation venue and directed ASCIET to conduct a four mission area evaluation in the FT Stewart/East Coast area. During FY 1998, ASCIET did not have an evaluation due to venue change: FY 1998 funding was used for planning ASCIET 99, production of final report for ASCIET 97, contractor, and basic operating costs.</p> <p>For FY 1999, ASCIET was directed by the JROC to increase the scope of the surface-to-surface (from company to battalion size elements) and also expand emphasis on air-to-surface evaluation. In order to meet these requirements, the Services will provided an additional 4.2M funding needed for the expanded evaluation.</p>										

R-1 Shopping List-Item No. 71

Exhibit R-2, RDT&E Budget Item Justification		Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 4	R-1 ITEM NOMENCLATURE Program Element 0603857J All Service Combat Identification Evaluation Team (ASCIET)		
ASCIET transfers from The Joint Staff to Joint Forces Command for FY2000-2005.			
<u>FY 1999</u>	<u>Description</u>		
\$7.200	Evaluation support: contracts for instrumentation/transport/rental equipment (track costs), participant travel, billeting, and per diem expenses, augmentees for evaluation manpower support (FAA, security, weapons systems specialist), military vehicles, loading/unloading equipment, etc. 2 Oct 98 – 30 Mar 99		
0.845	ASCIET operations: supplies, computer/upgrades, copiers, faxes, phone, members travel, base support, etc.		
4.631	Annual contracts: research of emerging technologies, analysis of data from evaluation.		
0.300	Conferences to plan evaluation: IPC, air space, opposing force, site visit, mid-term conference, final planning conference (FPC), concept of operations. 4 Oct 98– 30 Aug 99		
\$12.914	Total		
<u>FY 2000</u>			
\$0	ASCIET transferred to Joint Forces Command (Navy Executive Agent) in FY2000.		
<u>FY 2001</u>			
\$0			
<u>FY 2002</u>			
\$0			
B. Program Change Summary:			
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
FY 1999 President's Budget	12.976	13.231	
FY 1999 Appropriated Value	12.976		
Adjustments to Appropriated Value:			
a. Reallocation of Non-programmatic Reductions			
b. Congressional Non-Programmatic Adj/Inflation	-0.062		
c. Transfer to U.S. Joint Forces Command (Navy)		-13.231	
FY 2000 President's Budget	12.914	0	0
Reason for Change: Reductions reflect program's share of Congressional undistributed reductions and inflation. Program transfers to Joint Forces Command in FY2000 – FY2005.			
C. Other Program Funding Summary: NA			

R-1 Shopping List-Item No. 71

Exhibit R-2, RDT&E Budget Item Justification		Date: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 4	R-1 ITEM NOMENCLATURE Program Element 0603857J All Service Combat Identification Evaluation Team (ASCIET)	
<p>D. Evaluation Strategy: In FY 1999, ASCIET conducted an evaluation of all four Services' combat ID capabilities in an instrumented, tactical environment encompassing all combat ID mission areas: surface-to-surface, air-to-surface, surface-to-air, and air-to-air. This evaluation examined, investigated, and assessed various concepts of combat ID on the battlefield with existing and developmental TTP and recommend solutions to combat ID deficiencies. This evaluation utilized active, guard, and reserve personnel with currently fielded equipment in a scenario robust enough to produce shooter-level "fog of war" yet small enough to be fully instrumented. Planning included coordination with the Services, battle laboratories, doctrine commands, and tactics schools. The ASCIET 99 evaluation also provided a joint environment/scenario for data gathering by emerging technologies. The evaluation had a daily 5-hour vulnerability window, and included both day and night operations, an extensive TADIL-J network incorporating Joint Surveillance Target Attack Radar System (JSTARS) aircraft, return to force aircraft, close air support missions over a maneuvering battlefield, joint theater missile defense and joint combat search and rescue. The evaluation utilized actual Soviet aircraft and vehicles for opposition force realism. ASCIET analyzed resulting data to quantify combat ID capabilities/shortfalls and identify opportunities for TTP development and systems improvement.</p> <p>E. Schedule Profile: Not applicable. ASCIET conducts an annual combat ID evaluation, employing assets from all four armed Services, to evaluate combat ID and mission effectiveness of representative forces using currently fielded systems in a realistic environment. Three major planning conferences involving Service participants as well as mini-evaluations, demonstrations, and rehearsals are used as a prelude to live evaluation to reduce technical risk, develop procedures and architectures, and refine operational plans.</p>		

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET BA4			ACTIVITY	RTD&E	PROGRAM ELEMENT 0603857J				PROJECT NAME AND NUMBER ASCIET			
Cost Categories (Tailor to WBS, or System/Item Requirements)	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
Operational Test & Evaluation	C/FP MIPR	SAIC EGLIN AFB	7.538	0		0		0	Oct	Cont		
Operational Test & Evaluation	SS/CPFF MIPR	Stanford Research Inst. Menlo Park CA	2.855	0		0		0	Jun	Cont		
Operational Test & Evaluation	SS/FP PO	MEVATEC EGLIN AFB	1.81	0		0		0	Jan	Cont		
Evaluation other Costs		Savannah GA	6.000	0		0		0				
Travel & Conferences		ASCIET/Various	.874	0		0		0		Cont		
Operational Costs/Research		ASCIET/Various	1.899	0		0		0		Cont		
Subtotal T&E			20.976	0		0		0				
<p>Remarks: ASCIET is not a management type organization. The annual evaluation is planned and executed IAW the directives received from the JROC and the requirements of the four armed Services. ASCIET does not develop systems to deliver, but evaluates systems and TTPs.</p> <p>* Program has transferred to Joint Forces Command (Navy) for FY 00-05.</p>												
Total Cost			20.976	0		0		0				
Remarks												

Exhibit R-2, RDT&E Budget Item Justification								Date: February 2000		
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 6					R-1 ITEM NOMENCLATURE 0605126J Joint Theater Air and Missile Defense Organization (JTAMDO)					
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
Total PE Cost	109.079	17.384	21.200	26.865	27.154	27.075	27.056		Continuing	Continuing
A. Mission Description and Budget Item Justification										
<p>JTAMDO is the single organization within the Department of Defense (DoD) chartered to plan, coordinate, and oversee joint integrated theater air and missile defense (TAMD) requirements, joint operational concepts, and operational architectures. JTAMDO is also responsible for proposing and evaluating concepts, architectures, capabilities and technologies. Evaluations are to determine deficiencies in DoD's air and missile defense capabilities and their impact on warfighting CINCs in order to define requirements, architectures, and weapon system performance. The JTAMDO functions are: serve as the operational community's proponent for requirements in theater air and missile defense; serve as the joint theater air and missile defense resource proponent within the resource allocation structures of the Services, BMDO, and DARPA; lead TAMD mission area analysis; conduct evaluations and demonstrations of joint air defense architectures and concepts; monitor the research, development, acquisition, and demonstration activity associated with the Service's TAMD programs; recommend to the JROC and USD A&T requirements, technologies, architectures, and concepts which should be evaluated, developed, and fielded; develop and maintain the TAMD Master Plan which will contain requirements, assessments of current and future capabilities, and an acquisition roadmap for development and fielding of required capabilities. Increased funding from FY 2001 through FY 2005 is to establish a Joint Distributed Engineering Plant (JDEP). The Joint Distributed Engineering Plant's objective is to improve interoperability of weapons systems and platforms through more rigorous testing and evaluation in a replicated battlefield environment. This program is in budget activity 6 – as it performs general support of RDT&E Activities.</p>										
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>					
	\$1.275	1.383	1.375	1.401	To fund JTAMDO operations, including office lease, equipment, training, facility maintenance, administrative support, technical support and travel.					
	\$4.599	5.074	4.488	4.577	To fund demonstration activities, including additional analysis at planned Service test and technology demonstration (USAF and USMC) focusing on joint concepts to define requirements and employment concepts.					
	\$2.247	2.206	1.793	2.236	Conduct modeling and simulation activities to: provide an analytical basis for requirements; develop and evaluate new battle management concepts and employment concepts; examine the impact and application of advanced technology concepts. Planned activities include integration of AWACs and Patriot with the Navy's Cooperative Engagement Capability (CEC) system; examination of basic employment concepts for joint engagement zone operations; and examination of cruise missile defense systems and architectures to determine current and future DOD capabilities.					
	\$7.168	6.762	6.593	6.662	Conduct analysis. There are various activities such as: Service support, single integration airpicture (SIAP), combat identification, battle management, analysis and requirements, advanced studies, developing threat scenarios to support analysis efforts, conduct initial planning and development for a FY02 TAMD demonstration					
	\$1.999	1.959	1.951	1.989	Provide direct support to CINCs to evaluate and explore unique CINC problem areas in TAMD by facilitating and funding the participation of agencies, C2 platforms, and test support equipment and personnel in exercises such as Fowl Eagle and Optic Windmill.					
	91.791				Congressionally directed funds to support a variety of TAMD program, studies, and analysis.					
	\$109.079	17.384	21.200	26.865	Joint Distributed Engineering Plant to improve testing and evaluation rigor resulting in better interoperability.					
					Total					
B. Program Change Summary:										

R-1 Shopping List - Item No 106

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 6	R-1 ITEM NOMENCLATURE 0605126J Joint Theater Air and Missile Defense Organization (JTAMDO)
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	FY 1999	FY 2000	FY 2001	FY 2002
FY 2000 President's Budget	109.599	17.079	16.713	17.042
FY 2000 Appropriated Value		27.079		
Adjustments to Appropriated Value:				
a. Reallocation of Non-programmatic Reductions	-0.520		-400	
b. Congressional Non-Programmatic Adj/Inflation		-.153	-.113	-.177
c. Congressional Rescission		-.331		
d. OSD Transfer to Navy		-10.000		
d. Programmatic Increase		.789	5.000	10.000
FY 2001 President's Budget	109.079	17.384	21.200	26.865

Reason for Change: The decrease from the FY 1999 to FY 2000 budget is due to a FY99 one-time congressionally mandated increase for Theater Air Missile Defense (TAMD). FY1999 reductions reflect program's share of Congressional undistributed reductions and inflation adjustments. FY 2000 increase due to Congressional addition to JTAMDO funding, which was transferred to the Navy because it better fit their electronic warfare program. An additional decrease is due to the Congressional Rescission. Programmatic increase is to begin Joint Distributed Engineering Plant (JDEP) panning and preparation for FY 2001. FY 2001 non-programmatic reduction reflects direction to transfer funds to the JSIMS program to meet IOC date (April 2001). The other non programmatic reduction is for general inflation. The 5 million programmatic increase for FY01 is to fund the Joint Distributed Engineering Plant.

C. Other Program Funding Summary: Not Applicable

D. Acquisition Strategy:

The strategy developed to examine JTAMD functions, missions, and capabilities is to: identify and develop a joint and netted JTAMD capability, integrated into a global architecture, leverage ongoing programs by exploring upgrades to existing weapons systems. By examining incremental improvements to the entire kill chain, the strategy is designed to avoid prematurely investing in single components at the expense of the overall family of systems, and to execute a demonstration based approach wherein systems upgrades and new system concepts are validated by field testing.

E. Schedule Profile.

(Fiscal Qtr)	FY 1999				FY 2000				FY 2001				FY 2002			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Infrastructure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Exercises and Demonstration	X	X			X	X	X	X	X	X	X	X	X	X	X	X
Mod Simulation	X	X			X	X	X	X	X	X	X	X	X	X	X	X
Analysis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CINC Support	X				X	X	X	X	X	X	X	X	X	X	X	X

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA 6			PROGRAM ELEMENT 0605126J						PROJECT NAME AND NUMBER JTAMDO			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performin g 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
Infrastructure	C/SS/PO	Various	2.051	1.383		1.375		1.401		Continuing	Cont.	
Exercises	MIPR/C	Various	8.654	5.074		4.488		4.577		Continuing	Cont.	
Experiments/Demonstrations	MIPR/C	Various	4.272	2.206		1.793		2.236		Continuing	Cont.	
Modeling and Simulation	MIPR/C	Various	13.626	6.762		6.593		6.662		Continuing	Cont.	
CINC Support	MIPR/C	Various	2.97	1.959		1.951		1.989		Continuing	Cont.	
Congressional Addition			91.791									
JDEP						5.000		10.000				
TOTAL			123.843	17.384		21.200		26.865				
Remarks:												
Total Cost			123.843	17.384		21.200		26.865				
Remarks												

R-1 Shopping List - Item No 106

APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE					
RDT&E, Defense Wide, Joint Staff/BA 7					PE: 0208052J Joint Analytic Model Improvement Program (JAMIP)					
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
Joint Warfare System (JWARS)	.833	1.012	11.941	12.163	8.182	7.408	5.689		N/A	TBD
Total PE Cost	.833	1.012	11.941	12.163	8.182	7.408	5.689		TBD	TBD

A. Mission Description and Budget Item Justification: In May 1995, DepSecDef approved JAMIP to improve analytic support to senior DOD officials. The Joint Staff/J-8 shares the lead with OSD/PA&E. The centerpiece of JAMIP is the development of the Joint Warfare System (JWARS), which will be a state-of-the-art, closed-form, constructive simulation of multi-sided, joint warfare for analysis. The Joint Staff and the Services have agreed upon JWARS as the common model to be used throughout the DOD analytic modeling community. JWARS is an advanced theater-level campaign analysis tool that will provide improved Command, Control, Communications, Computers and Intelligence (C4I) Surveillance and Reconnaissance (C4ISR) and balanced joint warfare representations and will be used for evaluation of courses of action, analysis of force sufficiency, force and capability trade-offs, objective force planning and force structure design, analysis of system alternatives, system trade-offs, and examination of operational concepts. Users of JWARS will include the combatant commanders, Joint Staff, Services, OSD, and other DOD organizations. R&D funds are used for research and design on challenging representation problems, and for test and evaluation, and are needed to continue development of the top priority joint warfare model as directed by DepSecDef and endorsed by VCJCS. This program is in Budget Activity 7 - Operational Systems Development because it supports currently employed systems and training activities.

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>
\$0.586	\$0.331	\$0.121	\$0.066	Management and professional support services
\$0.195	\$0.330	\$9.646	\$10.155	CAAS engineering and technical services
\$0.052	\$0.351	\$.922	\$0.867	FFRDC engineering and technical services
\$0.000	\$0.00	\$.364	\$.200	Appl S/W Maint & Dev
\$0.000	\$0.000	\$0.888	\$0.875	Other services
\$.833	\$1.012	\$11.941	\$12.163	Total

APPROPRIATION/BUDGET ACTIVITY**R-1 ITEM NOMENCLATURE**

RDT&E, Defense Wide, Joint Staff/BA 7

PE: 0208052J Joint Analytic Model Improvement Program (JAMIP)

B . Program Change Summary:

	FY 1999	FY 2000	FY 2001	FY 2002
FY 2000 President's Budget	1.842	1.024	0.358	0.197
FY 2000 Appropriated Value	.842	1.024		
Adjustments to Appropriated Value:				
a. Reallocation of Non-programmatic Reductions	-.009		-	
b. Congressional Non-Programmatic Rescission		-0.003		
c. Congressional Non-Programmatic Adj/Inflation		-0.009	-.063	-.080
d. Congressional Realignment for Report 106-244			9.246	8.946
e. Programmatic Adjustment			3.100	
FY 2001 President's Budget	.833	1.012	11.941	12.163

Reductions reflect program's share of Congressional undistributed reductions and inflation adjustments. Additions reflect realignment to comply with House Appropriations Committee guidance (Report 106-244) and to maintain JWARS/JDS/SAC levels of effort.

C. Other Program Funding Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	To <u>FY 2002</u>	Total <u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Complete</u>	<u>Cost</u>
O&M Defense-Wide	9.548	11.296	5.131	4.832	5.541	8.008	8.541	NA	NA
Procurement Defense-Wide	0.832	0.696	0.618	.399	.407	.0406	0.405	NA	NA

D. Acquisition Strategy: This program supports development of the JWARS model and the R&D effort will terminate as the model is fielded.

E. Schedule Profile:

(Fiscal Qtr)	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY 2002</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Alpha testing	X															
Release 1.0					X											
Release 2.0								X								
Release 3.0													X			

R-1 Shopping List - Item No 124

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY: RDT&E, Defense Wide, Joint Staff/BA 7			PROGRAM ELEMENT: 0208052J Joint Analytic Model Improvement Program (JAMIP)						PROJECT NAME: Joint Warfare System (JWARS)			
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
Management and professional support services	Various	Various	1.186	0.331		0.121		0.066		N/A	TBD	TBD
CAAS engineering and technical services	Various	Various	0.798	0.330		9.646		10.155		N/A	TBD	TBD
FFRDC engineering and technical services	Various	Various	0.557	0.351		0.922		0.867		N/A	TBD	TBD
Other services	Various	Various	1.292	0.000		0.1252		1.075		N/A	TBD	TBD
Subtotal Product Development			3.833	1.012		11.941		12.163		TBD	TBD	TBD
Remarks: T&E included under product development efforts.												
Total Cost			3.833	1.012		11.941		12.163				
Remarks												

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide, Joint Staff/BA 7					R-1 ITEM NOMENCLATURE C4I for the Warrior 0303149J						
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost	
Total PE Cost	2.798	2.982	5.486	5.935	6.469	6.645	6.835		TBD	TBD	
Advanced Concepts	2.636	2.779	5.285	5.757	6.284	6.465	6.661		TBD	TBD	
Joint Warrior Interoperability Demonstrations (JWID)	.162	.203	.201	.178	.185	.180	.174		TBD	TBD	

A. Mission Description and Budget Item Justification

The C4I for the Warrior (C4IFTW) concept, Network-centric operations along with the implementation of the Global Information Grid are key concepts for promoting joint coalition C4 interoperability worldwide. This program provides focus and visibility into resolving C4 interoperability issues and provides organizing principles, policy, and doctrine for information superiority as directed by JV2010. C4IFTW stresses interoperability and leverages the rapid pace of C4 technology advancements. This program is based on two subprograms: Advanced Concepts and Joint Warrior Interoperability Demonstrations (JWID). As the C4IFTW concepts evolve and mature, they will spawn new approaches to providing the joint warfighter with a fused near-real-time, true representation of the battlespace. Its goal is to bring the warrior an accurate and complete picture of the battlespace, timely and detailed mission objectives, and the clearest view of targets. The Advanced Concepts initiative is intended to leverage commercial technologies and government-funded developments to provide high priority technologies to the warfighter in the shortest period of time. The current focus of Advanced Concepts, the Network Warfare Simulation (NETWARS) model, addresses communications burden issues. The NETWARS model will assess the effects of full operational combat traffic loading on current and future tactical communications systems and networks in a Joint Task Force Major Theater of War scenario; conduct quick-turn communications planning for small regional conflicts or peacekeeping scenarios; and evaluate new communication systems and technologies. Funding for the Advanced Concept/NETWARS program increased \$17M over the period FY01-05, incorporated above. This increased funding will accelerate the addition of features and the development of device models for military unique equipment and systems, increase the number and scope of scenarios examined, and supports verification and validation and modeling standards development. It will also dramatically strengthen the ability to assess the impact of new technologies and operational concepts on military communications networks. The second subprogram is Joint Warrior Interoperability Demonstrations (JWID). JWID are Joint Staff-sponsored C4I demonstrations of existing, off-the-shelf, new and evolving C4I technologies. The demonstrations, which are jointly screened to determine ability to satisfy warfighting requirements, enable warfighters to operate these capabilities and assess their ability to enhance their operational missions.

* Costs beyond FY05 will be limited to on-going support, augmentation, and modification costs. The completion of NETWARS development by FY 2005/4th Qtr assumes moderate inputs from analytical users and resultant additions and revisions to the NETWARS requirements, but assumes no significant or radical changes to the NETWARS software / model requirements.

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense-Wide, Joint Staff/BA 7	R-1 ITEM NOMENCLATURE C4I for the Warrior	0303149J
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B. Program Change Summary.

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>
FY 2000 President's Budget	2.798	3.018	2.915	2.974
FY 2000 Appropriated Value		3.018		
Adjustments to Appropriated Value:				
a. Reallocation of non-programmatic adjustments			.	
b. Congressional Non-Programmatic Adj/Inflation		-.028	-.029	-.039
c. Congressional Non-Programmatic Rescission		-.008		
d. Programmatic Increase to fund NETWARS			2.600	3.000
FY 2001 President's Budget	2.798	2.982	5.486	5.935
Programmatic Adjustments				

Reason for Change: Congressional Non-programmatic adjustments/inflation. Programmatic increase initiated is to fully fund NETWARS program.

C. Other Program Funding Summary

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
O&M Defense-Wide	1.163	1.467	1.488	1.396	1.389	1.425	1.449	TBD	TBD
Procurement Defense-Wide	.776	.880	.861	.970	.969	.951	.930	TBD	TBD

D. Acquisition Strategy: N/A.

E. Schedule Profile.

The RDT&E will be spent during various quarters of each FY.

Exhibit R-2a, RDT&E Project Justification

Date: February 2000

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7		PROGRAM ELEMENT 0303149j			PROJECT NAME AND NUMBER C4I for the Warrior – Advanced Concepts					
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
Advanced Concepts	2.636	2.779	5.285	5.757	6.284	6.465	6.661		TBD	TBD
RDT&E Articles Qty	n/a	n/a	n/a	n/a	n/a	n/a	n/a			

A. Mission Description and Budget Item Justification

The C4I for the Warrior concept, Network-centric operations along with the implementation of the Global Information Grid are key concepts for promoting joint coalition C4 interoperability worldwide. This program provides focus and visibility into resolving C4 interoperability issues and provides organizing principles, policy, and doctrine for information superiority as directed by JV2010. C4IFTW stresses interoperability and leverages the rapid pace of C4 technology advancements. The Advanced Concepts subprogram is intended to leverage commercial technologies and government-funded developments to provide high-priority technologies to the warfighter in the shortest period of time. The initiative provides “seed money” to help focus on large scale advanced development efforts to satisfy current and projected warfighter needs. A primary means to evaluate emerging C4ISR technologies, from a requirement point of view, is via simulation. This simulation will be capable of evaluating emerging technologies, performing communications assessment, and doing contingency planning. It will be evolved through prototyping, database development, and rigorous verification and validation. The objective is to use the simulation to investigate high priority warfighter C4ISR technologies in the context of realistic warfighter scenarios. The current focus of Advanced Concepts, the Network Warfare Simulation (NETWARS) model, addresses communications burden issues. This effort will start with small joint service scenarios, evolve to include complete Joint Task Force (JTF) scenarios, and ultimately to a Major Theater of War (MTW) with the thousands of communications nodes in a JTF each individually represented in detail in the NETWARS model. Ultimately, the CINCs will have a tool to assist them in conducting network management scenarios to optimize and insure full and efficient C4 systems.

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>
1.000	.811	1.600	1.600	Software Development
.200	.200	.200	.200	Verification & Validation
.000	.000	.000	.400	P3I
.711	.763	2.134	2.652	Developmental Studies & Data Expansion
.400	.400	.400	.400	Program Mgmt
.100	.100	.100	.100	Configuration Mgmt
.200	.180	.180	.180	Contractor Eng. Support (FFRDC)
.000	.000	.250	.000	Independent Cost Estimate (FFRDC)
.000	.250	.100	.100	Standardization
.025	.025	.221	.025	COTS HW & SW
.0	.050	.100	.100	Maintenance
2.636	2.779	5.285	5.757	Total

B. Other Program Funding Summary: not applicable

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7	PROGRAM ELEMENT 0303149j	PROJECT NAME AND NUMBER C4I for the Warrior – Advanced Concepts
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C. Program Development Strategy:
FY 1997: A Mission Needs Statement was developed and signed. Subsequent to initiating model development, an extensive Program Development Plan was developed and approved by the Director, Command, Control, Communications, and Computer (C4) Systems Directorate (J-6). A proof-of-concept effort validated the concept and determined that NETWARS would support the requirements. *FY 1998:* A Configuration Management Plan, Software Development and Integration Plan, and Systems Architecture Design Plan were developed. Initiated software and communications modules development, and integration. NETWARS Toolkit Version 1.1 functional requirements were derived, documented, and formalized. JWARS initial requirements for C4 were evaluated relative to expected analytical outputs from NETWARS. *FY 1999:* Based on further refinement and analysis of requirements, initiated a transition to lower risk developmental software, and toward building the NETWARS Toolkit Advanced Development, Interim Version. Concurrent communications studies of accepted Joint Task Force (JTF) scenarios will help to refine requirements, the development of data, and the development of models that represent the C4 processors, systems, and networks used in a JTF, that will become part of the NETWARS data and model repository. Continued development of NETWARS standards. *FY 2000-2001:* Interim Version 2.0 provided to CINCs/Services/Agency (C/S/A) users, including a training course, in Nov 1999. Continued development of NETWARS Toolkit Advanced Development, Version 2.0, associated documentation, and completion of parallel developmental studies of Southwest Asia, and Northeast Asia, and other Joint Task Force (JTF) scenarios, - - of up to 20,000 communications nodes - - and gathering requirements from model users. Develop requirements for Version 3.0 based on formal requirements capture subsequent to extensive use of both the NETWARS Toolkit Advanced Development, Interim Version, and the NETWARS Toolkit Advanced Development, Version 2.0, by the CINCs, Services, and Agencies. Continued development of data in conjunction with communications studies conducted in parallel with model development.

D. Schedule Profile:

The first Phase review was 23 September 1997, when the Phase I “proof of concept” results were presented to the J-6 and Service/agency representatives. The mid-Phase II In-Progress Review (IPR) to the J-6 and the Service/agency reps was held on 19 December 1997. Block I formally began in March 1997 and involved researching and writing a detailed NETWARS development plan, followed by conducting a “proof of concept” prototype demonstration of a small JTF scenario of 100 to 200 communications nodes. Block II began in mid-September 1997, and was completed in October 1998. In Block II, J6I continued the design and building to complete version 1.1 of the front-end toolset database, and completed a study of a small JTF of up to 5000 nodes, and a JTF scenario of up to 10,000 nodes. The scenario selected was the Synthetic Theater of War (STOW)/United Endeavor 98-1 scenario, which involved a Joint Task Force defense of Kuwait. Block III, Version 2.0, which began in April 1999, will involve advanced development, testing, and building of the Interim Version, and Version 2.0 front-end tool set database for NETWARS, plus completing a large major theater of war Joint Task Force scenario of up to 20,000 communications nodes. Version 2.0 phase review was 15 Dec 1999.

(Fiscal Qtr)	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY2002</u>
	1	2	3	4	1	2	3	4	1	2	3	4	
Contract Award -- Feb 99 to SRI(Contract revision Jan 00													
IOC									X				
FOC (FY 2005/4 th Qtr)													

Exhibit R-2a, RDT&E Project Justification

Date: February 2000

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7		PROGRAM ELEMENT 0303149j			PROJECT NAME AND NUMBER C4I for the Warrior – Joint Warrior Interoperability Demonstration (JWID)					
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
JWID	.162	.203	.201	.178	.185	.180	.174		TBD	TBD
RDT&E Articles Qty	n/a	n/a	n/a	n/a	n/a	n/a	n/a			

A. Mission Description and Budget Item Justification

The C4I for the Warrior concept, Network-centric operations along with the implementation of the Global Information Grid are key concepts for promoting joint coalition C4 interoperability worldwide. This program provides focus and visibility into resolving C4 interoperability issues and provides organizing principles, policy and doctrine for information superiority as directed by JV 2010. C4IFTW stresses interoperability and leverages the rapid pace of C4I technology advancements. The Joint Warrior Interoperability Demonstrations (JWIDs) (subprogram) are Joint Staff-sponsored demonstrations of evolving low-cost, low-risk C4I technologies and joint interoperability solutions impartially presented to the CINCs and Military Services in an operational environment. Specific demonstrations are selected to fulfill identified warfighter deficiencies and are designed to provide the opportunity to experiment with new and evolving capabilities, assess their value, and recommend them for implementation where appropriate. JWIDs provide a structured process where new C4 capabilities are rapidly inserted after being rigorously vetted, evaluated, and assessed by the warfighter. JWIDs are integral components of the "C4I for the Warrior" (C4IFTW) concept and the Joint Vision 2010 (JV 2010) conceptual template for future joint warfighting. Demonstrations are required to conform with established standards on systems interoperability and must also be integrated into approved architectures that are Defense Information Infrastructure (DII)/Common Operational Environment (COE) Joint Tactical Architecture (JTA) compliant.

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>Description</u>
.162	.203	.201	.178	Contract Engineering and Technical Support
.162	.203	.201	.178	Total

B. Other Program Funding Summary

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
O&M Defense-Wide	1.263	1.467	1.488	1.396	1.389	1.425	1.449	TBD	TBD
Procurement Defense-Wide	.776	.880	.861	.970	.969	.951	.930	TBD	TBD

C. Acquisition Strategy: N/A

D. Schedule Profile.

The RDT&E will be spent during various quarters of each FY.

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA7			PROGRAM ELEMENT 0303149j						PROJECT NAME AND NUMBER C4IFTW			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY00 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
Program Definition & Proof of Concept	CPFF	SRI, MITRE	.430	0	TBD	0	TBD	0	TBD	TBD	TBD	
Software Development	CPFF	SRI	2.274	.811	TBD	1.600	TBD	1.600	TBD	TBD	TBD	
Pgm Mgmt	CPFF	SRI/SAIC	1.366	.400	TBD	.400	TBD	.400	TBD	TBD	TBD	
COTS Hardware and Software	CPFF	SRI	.370	.025	TBD	.221	TBD	.025	TBD	TBD	TBD	
Subtotal Product Development			4.440	1.236		2.221		2.025		TBD	TBD	
Remarks:												
Communications Developmental Studies	CPFF	SRI	1.033	.763	TBD	2.134	TBD	2.652	TBD	TBD	TBD	
Configuration Mgmt	CPFF	SRI	.242	.100	TBD	.100	TBD	.100	TBD	TBD	TBD	
Maintenance	CPFF	SRI	.127	.050	TBD	.100	TBD	.100	TBD	TBD	TBD	
P3I	CPFF	SRI						.400				
Subtotal Support			1.402	.913		2.334		3.252		TBD	TBD	
Remarks												

R-1 Shopping List - Item No 134

Exhibit R-2a, RDT&E Cost Analysis

Exhibit R-3 Cost Analysis (page 2)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA 7			PROGRAM ELEMENT 0303149j						PROJECT NAME AND NUMBER C4IFTW			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY00 Cost	FY 00 Award Date	FY01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Verification & Validation		DISA	.700	.200	TBD	.200	TBD	.200	TBD	TBD	TBD	
Subtotal T&E			.700	.200		.200		.200		TBD	TBD	
Remarks												
Contractor (FFRDC) Eng Support		MITRE	.549	.180	TBD	.180	TBD	.180	TBD	TBD	TBD	
Independent Cost Estimate (ICE) (FFRDC)		MITRE	.100	0	TBD	.250	TBD	0	TBD	TBD	TBD	
Contract Engineering and Technical Support (JWID)		Various	.549	.203	TBD	.201	TBD	.178	TBD	TBD	TBD	
NETWARS Standardization		Various		.250		.100		.100				
Subtotal Management			1.198	.633		.731		.458		TBD	TBD	
Remarks												
Total Cost			7.740	2.982		5.285		5.757		TBD	TBD	
Remarks Awards to SRI under sole source contract, awarded Feb 99												

R-1 Shopping List - Item No 134

Exhibit R-2a, RDT&E Cost Analysis

APPROPRIATION/BUDGET ACTIVITY: RDT&E, Defense Wide, Joint Staff/BA 7					R-1 ITEM NOMENCLATURE: 0902298J Management Headquarters – Various					
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
Total PE Cost	9.287	9.220	12.540	13.269	13.166	13.322	12.925			
Joint Warfighting Capabilities Assessment	9.287	9.220	9.496	10.567	10.703	10.855	9.754		TBD	TBD
C4 Systems Support			1.950	1.957	1.966	1.972	1.982		TBD	TBD
Joint Staff Information Network			1.094	.745	.497	.495	1.189		TBD	TBD

A. Mission Description and Budget Item Justification:

This program Element contains three distinct Projects: Joint Warfighting Capabilities Assessment, Command Control, Communication Computers (C4) systems Support, and Joint Staff Information Network.

Joint Warfighting Capabilities Assessment (JWCA) are studies conducted in: strike, land and littoral warfare; strategic mobility and sustainability; sea, air, and space support; deterrence/counter proliferation; regional engagement/presence; command and control (C2); information warfare; intelligence, surveillance and reconnaissance; joint readiness (personnel); joint readiness (forces); and joint readiness (exercise/training), and reform initiatives (agency warfighting support). Each JWCA is sponsored by a Joint Staff directorate and is conducted by teams of warfighting and functional experts from the unified commands, services, office of the secretary of defense, federally funded research and development centers, and others as necessary. Assessments examine key relationships between warfighting capabilities/interactions and identify opportunities for improving warfighting effectiveness. This program is in Budget Activity 7 – Operational Systems Development because it supports currently employed systems and training activities.

C4 Systems Support - SATCOM Ops Analysis and Integration Tool goal effort is to provide for 1) assessment, oversight, and coordination of system architectural analysis and requirements to insure JV2010 supportability and 2) establishes a standard Joint Staff and CINC tool for SATCOM resource visibility, tracking and management and automated workflow. The desired tool will ultimately be capable of providing the Joint Staff & CINCs the ability to perform:

- a) Analysis of emerging CINC, Service, and agency SATCOM requirements to determine space system design drivers; facilitate prioritization; conduct trade analysis to ensure right mix of future commercial and military owned SATCOM; and assessment of SATCOM allied interoperability doctrine, requirements, and CONOPS.
- b) Monitoring of SATCOM status, payload, and terminal commands; and automate processing of user support requests.

Joint Staff Information Network (JSIN) is The Joint Staff's primary "weapon system." It consists of a classified and an unclassified local area network. The classified system operates at the TOP SECRET level and has access to DoD-wide SECRET networks controlled via a comprehensive system of security checks and guards. The unclassified system provides access to the Internet and hosts our connection to the Defense Message System (DMS) currently being implemented as a replacement for the legacy AUTODIN system. Both systems run the standard Microsoft Office suite of programs. Most day-to-day staff work on the staff is conducted on the classified network using a highly customized software program call the Joint Staff Action Processing (JSAP) system. This system was developed in conjunction with our current information technology (IT) support contractor (Dyncorp) and codifies our processes for creating, routing, reviewing, approving, and archiving staff packages in electronic form. JSAP has numerous commercial counterparts, and is

APPROPRIATION/BUDGET ACTIVITY:

RDT&E, Defense Wide, Joint Staff/BA 7

R-1 ITEM NOMENCLATURE:

0902298J Management Headquarters – Various

in fact being marketed by Dyncorp to other CINCs and services. Current direction states any commercially procured software requiring modification must be funded by RDT&E money. We envision replacing JSAP with a commercial product, and having to make modifications to incorporate Joint Staff procedures, forms, document templates, etc.

B. Program Change Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
FY 2000 President's Budget		9.531	11.507	12.606
FY 2000 Appropriated Value	.045	9.531		
Adjustments to Appropriated Value:				
a. Reallocation of Non-programmatic Adjustments	-0.045	-0.200		
b. Congressional Non-Programmatic Adj./Inflation		-0.084	-0.067	-0.087
c. Congressional Non-Programmatic Rescission		-0.027		
d. Realignment of O&M to RDT&E JSIN			1.100	.750
FY 2001 President's Budget	9.287	9.220	12.540	13.269

Reductions reflect program's share of Congressional undistributed reductions and inflation adjustments. FY01 FY02 program increase reflects JSIN realignment of funding as a result of Information Technology budgeting policy clarification and to comply with House Appropriations Committee guidance (Report 106-244).

C. Other Program Funding Summary: See individual Project Justification.

D. Acquisition Strategy: N/A

E. Schedule Profile: N/A

APPROPRIATION/BUDGET ACTIVITY:

RDT&E, Defense Wide, Joint Staff/BA 7

R-1 ITEM NOMENCLATURE:

0902298J Management Headquarters – Joint Warfighting Capabilities Assessment (JWCA).

COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
Total PE Cost	9.287	9.220	9.496	10.567	10.703	10.855	9.754		TBD	TBD

A. Mission Description and Budget Item Justification:

Joint Warfighting Capabilities Assessment (JWCA) are studies conducted in: strike, land and littoral warfare; strategic mobility and sustainability; sea, air, and space support; deterrence/counter proliferation; regional engagement/presence; command and control (C2); information warfare; intelligence, surveillance and reconnaissance; joint readiness (personnel); joint readiness (forces); and joint readiness (exercise/training), and reform initiatives (agency warfighting support). Each JWCA is sponsored by a Joint Staff directorate and is conducted by teams of warfighting and functional experts from the unified commands, services, office of the secretary of defense, federally funded research and development centers, and others as necessary. Assessments examine key relationships between warfighting capabilities/interactions and identify opportunities for improving warfighting effectiveness. Program growth between FY01 and FY02 is required to meet increasing demand for assessment studies and the growth in the number of JWCA teams. This program is in Budget Activity 7 – Operational Systems Development because it supports currently employed systems and training activities.

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>
7.764	7.391	7.978	8.687	CAAS Contracted Studies
1.878	1.797	1.518	1.880	CAAS Studies Federally Funded Research and Development Centers
<u>9.287</u>	<u>9.188</u>	<u>9.496</u>	<u>10.567</u>	Total

B. Program Change Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
FY 2000 President's Budget	9.332	9.531	9.947	10.636
FY 2000 Appropriated Value				
Adjustments to Appropriated Value:				
a. Reallocation of Non-programmatic Adjustments	9.332	-0.200	-0.400	
b. Congressional Non-Programmatic Adj./Inflation		-0.084	-0.051	-0.069
c. Congressional Non-Programmatic Rescission		-0.027		
FY 2001 President's Budget	9.287	9.220	9.496	10.567

Reductions reflect program's share of Congressional Rescission adjustments. FY01 program reduction (-0.400) is as a result of the transfer of funds to the JSIMS program to meet IOC date (April 2001).

C. Other Program Funding Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To	Total
O&M Defense-Wide	2.768	2.918	2.926	3.131	3.176	3.231	2.903		<u>Complete</u> N/A
									<u>Cost</u> N/A

Exhibit R-2, RDT&E Project Justification		Date: February 2000
APPROPRIATION/BUDGET ACTIVITY: RDT&E, Defense Wide, Joint Staff/BA 7	R-1 ITEM NOMENCLATURE: 0902298J Management Headquarters – Joint Warfighting Capabilities Assessment (JWCA).	
<p>D. Acquisition Strategy: This program represents a continuing level of effort supporting a wide range of studies in the JWCA process. The deliverables in each study reflect the analysis required to assist decision-makers as they examine the relationships between warfighting capabilities/interactions and identify opportunities for improving warfighting effectiveness.</p> <p>E. Schedule Profile: N/A</p>		

Exhibit R-3 Cost Analysis									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY: RDT&E, Defense Wide, Joint Staff/BA 7			PROGRAM ELEMENT: 0902298J Management Headquarters						PROJECT NAME: JWCA Studies			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY00 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
Contracted Studies	C/FP/MIPR	TBD		TBD	Var	TBD	TBD	TBD	TBD	Cont	TBD	TBD
Subtotal Support				7.423		7.978		8.687		Cont	TBD	TBD
Remarks: JWCA studies are not management organizations. The studies support the Joint Staff directorates and CINCs and are executed IAW directives received from the JROC. JWCA studies evaluate warfighting and supporting area assessments vice developing deliverable systems. FY 2000 and FY 2001 cost estimates cannot be determined pending prioritization by the JROC.												
FFRDC Studies	Reqn	TBD		TBD	Var	TBD	TBD	TBD	TBD	Cont	TBD	TBD
Subtotal Support				1.797		1.518		1.880		Cont	TBD	TBD
Remarks: JWCA studies are not management organizations. The studies support the Joint Staff directorates and CINCs and are executed IAW directives received from the JROC. JWCA studies evaluate warfighting and supporting area assessments vice developing deliverable systems. FY 2000 and FY 2001 cost estimates cannot be determined pending prioritization by the JROC.												
Total Cost				9.220		9.496		10.567				
Remarks												

Exhibit R-2a, RDT&E Project Justification

Date: February 2000

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7		PROGRAM ELEMENT 0902298J		PROJECT NAME AND NUMBER C4 Systems Support (SATCOM Ops Analysis and Integration Tools)						
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
SATCOM Ops Analysis and Integration Tools	0	0	1.950	1.957	1.966	1.972	1.982		TBD	TBD
RDT&E Articles Qty	n/a	n/a	n/a	n/a	n/a	n/a	n/a			

A. Mission Description and Budget Item Justification

The goal of the SATCOM Ops Analysis and Integration Tool effort is to provide for 1) assessment, oversight, and coordination of system architectural analysis and requirements to insure JV2010 supportability and 2) establishes a standard Joint Staff and CINC tool for SATCOM resource visibility, tracking and management and automated workflow. The desired tool will ultimately be capable of providing the Joint Staff & CINCs the ability to perform:

- a) Analysis of emerging CINC, Service, and agency SATCOM requirements to determine space system design drivers; facilitate prioritization; conduct trade analysis to ensure right mix of future commercial and military owned SATCOM; and assessment of SATCOM allied interoperability doctrine, requirements, and CONOPS.
- b) Monitoring of SATCOM status, payload, and terminal commands; and automate processing of user support requests.

<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>
1.1	1.0	Software Development
.200	.200	Program Mgmt
.140	.087	COTS HW & SW
.150	.160	Developmental Studies
.000	.210	Verification and Validation
.200	.000	Independent Cost Estimate (FFRDC)
.160	.300	Contract Engineering and Technical Support
1.950	1.957	Total

B. Other Program Funding Summary

R-1 Shopping List - Item No 150

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7	PROGRAM ELEMENT 0902298J	PROJECT NAME AND NUMBER C4 Systems Support (SATCOM Ops Analysis and Integration Tools)
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	<u>FY 2001</u>	<u>FY 2002</u>
FY 2000 President's Budget	1.960	1.970
Inflation Adjustments	<u>.010</u>	<u>.013</u>
	1.950	1.957

There are no RDT&E funds for this program in FY00.

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
O&M Defense-Wide	0	.975	0	0	0	0	0	TBD	TBD
Procurement Defense-Wide	0	0	0	0	0	0	0	TBD	TBD

C. Program Development Strategy:

FY 2000: The FY00 increment of funding (O&M) will be used for system assessment and for developing the requirements and inputs for the analysis tool. A thorough system assessment effort will ensure that the subsequent software engineering is adequate to meet mission requirements, and does not duplicate other efforts. In addition to the original need for an operational modeling capability, the recent Kosovo operation highlighted the need for a SATCOM architecture decision analysis tool to rapidly examine alternative operational courses of action *FY 2001-2002:* Supports the software engineering and actual development of the software tool in compliance with the requirements developed in FY00. In addition, because the SATCOM doctrine, requirements, technology, and market are in a continuous state of change, the system-engineering task will continue. This continuing effort will monitor the changing SATCOM environment to ensure that the modeling software will be able to reflect the latest developments.

A. Schedule Profile: This program is a new start in FY00.

	<u>FY 2000</u>				<u>FY 2001</u>				<u>FY 2002</u>			
(Fiscal Qtr)	1	2	3	4	1	2	3	4	1	2	3	4
Contract Award* -- Jul 97												
IOC (FY 2003/4 th Qtr)												
FOC (FY 2005/4 th Qtr)												

*Remarks: All awards to SAIC under competitively won umbrella support contract, awarded Jul 97.

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA7			PROGRAM ELEMENT 0902298J Management Headquarters						PROJECT NAME AND NUMBER C4 Systems Support (SATCOM Ops Analysis and Integration Tools)			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY00 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
Program Definition & Proof of Concept										TBD	TBD	
Software Development	CPFF	SAIC, Aerospace, Scitor				1.100		1.000		TBD	TBD	
Pgm Mgmt	CPFF	SAIC				.200		.200		TBD	TBD	
COTS Hardware and Software	CPFF	SAIC				.140		.087		TBD	TBD	
Subtotal Product Development						1.450		1.300		TBD	TBD	
Remarks:												
Developmental Studies	CPFF	SAIC				.150		.160		TBD	TBD	
Subtotal Support						.150		.160		TBD	TBD	
Remarks												

R-1 Shopping List - Item No 158

Exhibit R-2, RDT&E Cost Analysis

Exhibit R-3 Cost Analysis (page 2)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA 7			PROGRAM ELEMENT 0902298j						PROJECT NAME AND NUMBER C4 Systems Support (SATCOM Ops Analysis and Integration Tools)			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY00 Cost	FY 00 Award Date	FY01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Verification & Validation		DISA						.210		TBD	TBD	
Subtotal T&E								.210		TBD	TBD	
Remarks												
Independent Cost Estimate (ICE) (FFRDC)	CPFF	Aerospace				.200		0		TBD	TBD	
Contract Engineering and Technical Support	CPFF	SAIC				.160		.300		TBD	TBD	
Subtotal Management						.360		.300		TBD	TBD	
Remarks												
Total Cost						1.950		1.957		TBD	TBD	
Remarks All awards to SAIC under competitively won umbrella support contract, awarded Jul 97												

R-1 Shopping List - Item No 158

Exhibit R-2, RDT&E Cost Analysis

Exhibit R-2a, RDT&E Project Justification

Date: February 2000

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7		PROGRAM ELEMENT 0902298J		PROJECT NAME AND NUMBER Joint Staff Information Network (JSIN)						
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005		Cost to Complete	Total Cost
JSIN	0	0	1.094	0.745	0.497	0.495	1.189		TBD	TBD
RDT&E Articles Qty	n/a	n/a	n/a	n/a	n/a	n/a	n/a			

A. Mission Description and Budget Item Justification

The Joint Staff Information Network (JSIN) is The Joint Staff's primary "weapon system." It consists of a classified and an unclassified local area network. The classified system operates at the TOP SECRET level and has access to DoD-wide SECRET networks controlled via a comprehensive system of security checks and guards. The unclassified system provides access to the Internet and hosts our connection to the Defense Message System (DMS) currently being implemented as a replacement for the legacy AUTODIN system. Both systems run the standard Microsoft Office suite of programs. Most day-to-day staff work on the staff is conducted on the classified network using a highly customized software program call the Joint Staff Action Processing (JSAP) system. This system was developed in conjunction with our current information technology (IT) support contractor (Dyncorp) and codifies our processes for creating routing, reviewing, approving, and archiving staff packages in electronic form. JSAP has numerous commercial counterparts, and is in fact being marketed by Dyncorp to other CINCs and services. Current direction states any commercially procured software requiring modification must be funded by RDT&E money. We envision replacing JSAP with a commercial product, and having to make modifications to incorporate Joint Staff procedures, forms, document templates, etc.

<u>FY 2001</u>	<u>FY 2002</u>	<u>Description</u>
.300	.000	Market Analysis/Product Comparison Study
.450	.100	COTS Software Purchase
.200	.150	Hardware Purchase
<u>.144</u>	<u>.495</u>	COTS S/W Modification, Testing, & Integration
1.094	.745	Total

B. Other Program Funding Summary

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
FY 2000 President's Budget		0.0	0	0
FY 2000 Appropriated Value	0	0.0		
Adjustments to Appropriated Value:				
a. Congressional Non-Programmatic Adj./Inflation		0.0	-.006	-0.005
b. Realignment of OM to RDT&E JSIN			<u>1.100</u>	<u>.750</u>
FY 2001 President's Budget	0.0	0.00	<u>1.094</u>	<u>.745</u>

Reductions reflect program's share of Congressional inflation adjustments. FY01 FY02 program increase reflects JSIN realignment of funding as a result of Information Technology budgeting policy clarification and to comply with House Appropriations Committee guidance (Report 106-244).

R-1 Shopping List - Item No 150

Exhibit R-2a, RDT&E Project Justification

APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide, Joint Staff/BA 7	PROGRAM ELEMENT 0902298J	PROJECT NAME AND NUMBER Joint Staff Information Network (JSIN)
--	-----------------------------	---

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
O&M Defense-Wide	0		0	0.500	0.500	0	0	TBD	TBD
Procurement Defense-Wide	0	0	0	0.200	0.200	0	0	TBD	TBD

C. Program Development Strategy: JSAP will continue to be supported while we evaluate candidate replacements. Staff buy-in will be paramount due to how deep JSAP permeates through the daily operations of The Joint Staff. JSIRMO/SEID will evaluate candidates in conjunction with the staff and our support contractor. System chosen will be acquired, modified by the developer, and then integrated into JSIN via contract task orders issued to our support contractor. We envision periodic software upgrades to the system driven by contractor upgrades, version releases, and emergency fix releases. System life cycle is envisioned to be four years due to the pace of technology upgrades.

D. Schedule Profile: RDT&E funding line is new to this program starting in FY01.

	(Fiscal Qtr)	<u>FY 2001</u>				<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Candidate Evaluation	(FY 01/2 nd & 3 rd Qtrs)		X	X														
System Modifications	(FY 01/4 th & FY02/1 st Qtr)				X	X												
Engineer, Integration, Test	(FY02/2 nd & 3 rd Qtrs)					X	X											
Operate and maintain	(FY02/4 th Qtr – FY04/4 th Qtr)							X		X	X	X	X	X	X	X	X	X

Exhibit R-3 Cost Analysis (page 1)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY 0400/BA7			PROGRAM ELEMENT 0902298J Management Headquarters						PROJECT NAME AND NUMBER Joint Staff Information Network (JSIN)			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY00 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
										TBD	TBD	
Market Analysis	CPFF	TBD/Wash, DC	0.0	0.0	N/A	.300	10/00	0.0	10/01	TBD	TBD	
COTS Software Purchase	CPFF	TBD/Wash, DC	0.0	0.0	N/A	.450	10/00	.100	10/01	TBD	TBD	
Hardware Purchase	CPFF	TBD/Wash, DC	0.0	0.0	N/A	.200	10/00	.150	10/01	TBD	TBD	
COTS S/W Mod, Int, & Test	CPFF	TBD/Wash, DC	0.0	0.0	N/A	.144	10/00	.495	10/01	TBD	TBD	
Subtotal Product Development						1.094		.745		TBD	TBD	
Remarks: Performing activity TBD as source selection will occur 3 rd Qtr FY00. Hardware purchases may be done by the government via an IDIQ if determined more advantageous.												
Developmental Studies												
Total Support			0.0							TBD	TBD	
Remarks												

Exhibit R-2, RDT&E Budget Item Justification

Date: February 2000

APPROPRIATION/BUDGET ACTIVITY								R-1 ITEM NOMENCLATURE		
RDT&E, Defense Wide, Joint Staff/BA-7								PE 0902740J Joint Simulation System (JSIMS)		
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost	
Total PE Cost	24.564	18.369	24.095	17.862	17.714	21.896	23.385		192.338	
JSIMS	24.564	18.369	24.095	17.862	17.714	21.896	23.385		192.338	
Quantity of RDT&E Articles	1	1	1	1	1	1	1		1	

A. Mission Description and Budget Item Justification

JSIMS is at the leading edge of the Goldwater-Nichols Act as the vehicle to institute interoperability and joint training and eliminate Service stovepipe training. JSIMS is a single, seamlessly integrated simulation environment designed to train Commanders in Chief (CINCs) and Services to meet the Chairman's Joint Training System requirements. It includes core infrastructure and mission space objects, both maintained in a common repository. The objects can be composed to create a simulation capability to support joint or Service training, rehearsal, or education objectives. JSIMS is a core of common and joint representations and services, hardware and software infrastructure, interfaces, and representations of Air/Space, Land, and Maritime Warfare functionality. JSIMS includes a strategy for specific representations. This synopsis also summarizes the JSIMS development acquisition strategy, which was originally outlined in the formal JSIMS Systems Acquisition Master Plan (SAMP) dated October 1998. JSIMS is specifically supported by overarching guidance and the 1998 Secretary of Defense Annual Report to the President and Congress (page 146). This program is in Budget Activity 7 – Operational Systems Development, because it supports currently employed systems and training activities.

FY 1999

\$.878 Civilian Pay Compensation and Benefits
 \$.220 Travel
 \$.276 Office Space Lease
 \$20.533 Software Development and Award Fee
 \$.560 Government Engineering Support
 \$ 1.695 Systems R&D Development Support
 \$.062 Program Management Support
 \$.340 Other Program Costs
 \$24.564 Total

FY 2000

\$.801 Civilian Pay Compensation and Benefits
 \$.200 Travel
 \$.283 Office Space Lease
 \$15.219 Software Development and Award Fee
 \$ 1.461 Systems Development R&D Support
 \$.398 Government Engineering Support
 \$.007 Other Program Costs
 \$18.369 Total

R-1 Shopping List - Item No 158

APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE													
RDT&E, Defense Wide, Joint Staff/BA-7	PE 0902740J Joint Simulation System (JSIMS)													
<u>FY 2001</u>														
\$.900	Civilian Pay Compensation and Benefits													
\$.275	Travel													
\$.292	Office Space Lease													
\$19.236	Software Development and Award Fee													
\$ 1.543	Systems Development R&D Support													
\$.237	Other Program Costs													
\$ 24.095	Total													
B. Program Change Summary:														
	<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>							
FY 2000 President's Budget	24.564			18.421			16.323							
FY 2000 Appropriated Value	24.564			18.421										
Adjustments to Appropriated Value:														
a.	Reallocation of non-programmatic adjustments						7.900							
b.	Congressional Non-Programmatic Adj/Inflation						-.128							
c.	Congressional Rescission						-0.052							
FY 2001 President's Budget	24.564			18.369			24.095							
Reason for Change: Increase reflects PDM I direction to transfer funds to the JSIMS program to meet IOC date (April 2001).														
C. Other Program Funding Summary : N/A														
D. Acquisition Strategy: Deliver a Joint Simulation System (JSIMS) as developed via a Cost Plus Award Fee (CPAF) contract awarded on 2 Dec 96. This development effort is in conjunction with the SAMP cited in paragraph A above and in accordance with an Acquisition Program Baseline (APB) dated March 1998.														
E. Schedule Profile.														
	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					
(Fiscal Qtr)	1	2	3	4	1	2	3	4	1	2	3	4		
Build 0 Development Readiness Milestone														
Build 0 Integration Readiness Milestone														
Build 1 Development Readiness Milestone			X											
Build 1 Integration Readiness Milestone			X											
Build 1 Demonstration				X										
Build 2 Development Readiness Milestone			X											
Build 2 Integration Readiness Milestone					X									
Build 2 Collaborative Event						X								
Build 3 Development Readiness					X									
Build 3 Integration Readiness Milestone							X							
Build 3 Collaborative Event										X				
JSIMS Initial Fielding (IOC – Mar 02)														

Exhibit R-3 Cost Analysis (page 1) Joint Simulation System (JSIMS)									Date: February 2000			
APPROPRIATION/BUDGET ACTIVITY RDTE/BA-7				PROGRAM ELEMENT 0902740J				PROJECT NAME AND NUMBER JSIMS				
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Development Support	DO	ARINC/PTI, Annapolis, MD	.945								.945	N/A
Software Development	CPAF	TRW, Orlando, FL	31.925	17.774	11/98	14.007	11/99	16.334	11/00	21.030	101.222	101.222
Award Fees			1.370	2.759		1.212		2.902		7.211	15.454	15.254
Subtotal Support			34.240	20.533		15.219		19.236		28.241	117.521	116.376
Remarks												
NOTE: These contracts awarded by USAF, Electronic Systems Command, Hanscom AFB, MA.												
Developmental Test & Evaluation	MIPR	Army, APG, MD	.075	.100	8/99	.016	12/99				.1915	N/A
Subtotal T&E			.075	.100		.016					.191	
Remarks												
Systems R&D Development Support	IDIQ/ T&M	Nations, Inc./BTG. Orlando, FL	3.364	1.287	10/98	1.049	12/99	1.119	10/00		6.819	N/A
Systems R&D Development Support	FFRDC/C PFF	Mitre Corp., McLean, VA	1.379	.408	10/98	.412	10/99	.412	10/00		2.611	N/A
Government Engineering Support	MIPR	Army, Orlando, FL	.350	.275	12/98	.275	02/00	.275	01/01		1.175	N/A
Government Engineering Support	MIPR	Army, Orlando, FL	.193	.113	6/99	.120	03/00	.125	01/01		.551	N/A
Government Engineering Support	MIPR	Army, Orlando, FL	.090	.095	9/99			.575	11/00		.760	N/A
Program Management Personnel	MIPR	NPGS, Monterey, CA	.290		11/98						.290	N/A
Program Management Personnel	MIPR	USAF, Hanscom AFB, MA	.734	.062	12/98						.796	N/A
Travel	MIPR	Navy, Orlando, FL	.461	.473	10/98	.244	10/99	.425	10/00		1.603	N/A
Labor	MIPR	Navy, Orlando, FL	1.463	.777	10/98	.878	10/99	.900	10/00		4.018	N/A
Overhead		Various	1.762	.441	12/98	.156	12/99	1.028	12/00		3.515	N/A
Subtotal Management			10.086	3.931		3.134		4.859			22.138	
Total Cost			44.401	24.564		18.369		24.095		28.241	138.983	
Remarks: *Reflects current amount to complete Integration & Development Contract. Current Cost to Complete program across remaining years of FYDP (FY02-05) is \$80.857M. JSIMS program is currently being restructured as directed by OSDUSD(AT&L) and DUSD(S&T); therefore, all costs and contracts will require modification in conjunction with this restructure. The next submission of this exhibit will begin reflecting some decisions made from these changes.												

R-1 Shopping List - Item No 158

Exhibit R-2, RDT&E Cost Analysis

The Joint Staff
FY 2001 Budget Estimates
Schedule of Civilian & Military Personnel
ADVISORY AND ASSISTANCE SERVICES

Research, Development, Test and Evaluation, Defense-wide

Category	FY 1999	FY 2000	FY 2001
1. Management & Professional Support Services			
FFRDC Work	-	-	-
Non-FFRDC Work	2,636	3,099	7,356
Subtotal	2,636	3,099	7,356
2. Studies, Analysis, and Evaluations			
FFRDC Work	1,652	1,897	1,518
Non-FFRDC Work	22,469	15,690	15,455
Subtotal	24,121	17,587	16,973
3. Engineering and Technical Services			
FFRDC Work	-	347	922
Non-FFRDC Work	4,828	1,837	10,838
Subtotal	4,828	2,184	11,760
4. Totals			
FFRDC Work	1,652	2,244	2,440
Non-FFRDC Work	29,933	20,626	33,649
Subtotal	31,585	22,870	36,089

Decrease in FY 2000 is primarily because of the transfer of the ASCIET Program from the Joint Staff to U.S. Joint Forces Command. Increase in FY 2001 consists of two parts. First, as a result of information technology budgeting policy clarification and to comply with House Appropriations Committee guidance (Report 106-244) O&M funds were moved to RDT&E (JSIN, SATCOM Ops, JWARS). Second, to address Command, Control, Communications, and Intelligence (C3I) Modeling and Simulation (M&S) shortfalls NETWARS, which supports a model to assess the effects of full operational combat traffic load on current and future tactical communications, and JAMIP, which supports the quadrennial review process, received additional funding.

**The Joint Staff
FY 2001 Budget Estimates
Schedule of Civilian & Military Personnel
ADVISORY AND ASSISTANCE SERVICES**

UNITED STATES SPECIAL OPERATIONS COMMAND



FISCAL YEAR 2001 BUDGET ESTIMATES

RDT&E, DEFENSE-WIDE

FEBRUARY 2000



UNITED STATES SPECIAL OPERATIONS COMMAND
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDEINTRODUCTION AND EXPLANATION OF CONTENTS

1. General. This document provides summary information on Research, Development, Test and Evaluation (RDT&E) programs for the United States Special Operations Command RDT&E program elements and projects in the FY 2001 President's Budget. The R-2, R-2a, and R-3 exhibits provide narrative information on all RDT&E program elements and projects.
2. Comparison of FY 1999 and 2000 Data. A direct comparison of FY 1999 and FY 2000 data to the R-1 exhibit dated February 1999 will reveal a significant increase in FY 2000, which is attributable to Congressional action on the appropriation.
3. Relationship of FY 2000/2001 Budget Structure to the FY 2000 Budget Approved by Congress.
 - a. Program Element 0304210BB was established under the Joint Military Intelligence Program (JMIP). The budget exhibit for this Program Element is submitted in the JMIP President's Budget.
 - b. There are no project-level new starts or program terminations.
4. Classification. This supplement is unclassified. USSOCOM's classified exhibits are provided under separate cover. Contact the USSOCOM Comptroller for a list of the Program Elements.
5. Table of Contents. The Table of Contents is presented in two different formats—by R-1 line item order and alphabetically.

UNITED STATES SPECIAL OPERATIONS COMMAND
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

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159	1160401BB	Special Operations Technology Development S100, Special Operations Technology Base Development	9 11
160	1160402BB	Special Operations Advanced Technology Development S200, Special Operations Special Technology Development	17 19
161	1160404BB	Special Operations Tactical Systems Development 3284, SOF Aircraft Defensive System 3326, AC-130U Gunship D615, SOF Aviation S0417, Underwater Systems Advanced Development S1684, SOF Surface Craft Advanced Development S350, Special Operations Forces Planning and Rehearsal System S625, SOF Training Systems S700, Communications Advanced Development S800, Munitions Advanced Development SF100, Aviation Systems Advanced Development SF200, CV-22 SOF Osprey	25 29 37 43 49 57 63 69 75 85 91 99

UNITED STATES SPECIAL OPERATIONS COMMAND
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

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UNITED STATES SPECIAL OPERATIONS COMMAND
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

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Special Operations Advanced Technology Development	160	1160402BB	17
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Special Operations Intelligence Systems Development	162	1160405BB	105
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Special Operations Tactical Systems Development	161	1160404BB	25
3284, SOF Aircraft Defensive System			29
3326, AC-130U Gunship			37
D615, SOF Aviation			43
S0417, Underwater Systems Advanced Development			49
S1684, SOF Surface Craft Advanced Development			57
S350, Special Operations Forces Planning and Rehearsal System			63
S625, SOF Training Systems			69
S700, Communications Advanced Development			75
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UNITED STATES SPECIAL OPERATIONS COMMAND
RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

SF200, CV-22 SOF Osprey

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UNITED STATES SPECIAL OPERATIONS COMMAND

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

OVERVIEW

The United States Special Operations Command (USSOCOM), one of the unified commands in the U.S. military's combatant command structure, is composed of Army, Navy, and Air Force Special Operations Forces (SOF). USSOCOM's mission is to support the geographic commanders-in-chief (CINCs), ambassadors and their country teams, and other government agencies by preparing SOF to successfully conduct special operations, including civil affairs and psychological operations, spanning the entire spectrum of operations. The commander in chief of USSOCOM (USCINCSOC) has two roles. In his capacity as a supporting CINC, he provides trained and ready SOF. In his role as a supported CINC, the USCINCSOC must be prepared to exercise command of selected special operations missions when directed by the National Command Authorities.

USSOCOM is the only operational command directly responsible for determining its own force structure requirement, determining the related materiel requirements, procuring the SOF-unique equipment, and training and deploying its own units. Army component forces consist of Special Forces (Green Berets), Rangers, special operations aviation, civil affairs and psychological operations specialists, and combat support and service support units. Navy component forces are organized to support naval and joint special operations within the theater unified command. These forces are organized, equipped, and trained to be highly mobile and quickly deployable and consist of Sea, Air, Land (SEAL) Teams and special boat units. The Air Force component forces are comprised of highly trained, rapidly deployable airmen who are equipped with highly specialized fixed and rotary-wing aircraft. Air Force Special Operations Command's *quiet professionals* deliver the nation's specialized air power to provide: SOF mobility, forward presence and engagement, precision employment/strike, and information operations. The Joint Special Operations Command is a joint headquarters designed to study special operations requirements and techniques, ensure interoperability and equipment standardization, plan and conduct special operations exercises and training, and develop joint special operations tactics.

Research, development, test and evaluation (RDT&E) funds are required since technological advances continue to provide critical advantages for special operations. Many of the benefits of RDT&E efforts will also accrue to conventional forces. A dynamic and uncertain security

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UNITED STATES SPECIAL OPERATIONS COMMAND

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

environment has drastically increased the theater requirements for SOF. Adequate funding is essential if SOF are to maintain their current capability and prepare to meet the future's challenges.

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SPECIAL OPERATIONS COMMAND RDT&E PROGRAM

Appropriation: 0400 Research Development Test & Evaluation Defense - WideTOA, \$ in Millions

<u>Program Element #</u>	<u>Item</u>	<u>Budget Activity</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
1160279BB	Small Business Innovative Research	7	4.068	4.896	
1160401BB	Spec Operations Technology Development	7	3.750	6.875	7.360
1160402BB	Spec Operations Advanced Technology Development	7	28.305	7.743	7.778
1160404BB	Spec Operations Tactical Systems Development	7	128.931	147.438	133.520
1160405BB	Spec Operations Intelligence Systems Development	7	8.417	5.138	3.022
1160407BB	SOF Medical Technology Development	7	1.945	3.863	2.065
1160408BB	SOF Operational Enhancements	7	39.179	61.739	87.071

Total Operational Systems Development:**214.595****237.692****240.816****Total Special Operations Command:****214.595****237.692****240.816**

RDT&E Programs - Comparison Report (Dollars in Millions)
 All Items in Budget Activity 7

FEBRUARY 2000

Program Element / Project	Submit	FY99	FY00	FY01	FY02	FY03	FY04	FY05
<u>PE1160279BB Small Business Innovative Research</u>								
S050 SMALL BUSINESS INNOVATIVE RESEARCH	00PB	4.068						
	01PB	4.068	4.896					
<u>PE1160401BB Spec Operations Technology Development</u>								
S100 SO TECHNOLOGY BASE DEV	00PB	3.750	7.093	7.706	8.326	8.957	9.134	9.326
	01PB	3.750	6.875	7.360	8.268	8.885	9.056	9.235
<u>PE1160402BB Spec Operations Advanced Technology Development</u>								
S200 SPECIAL OPERATIONS SPECIAL TECHNOLOGY	00PB	28.409	7.990	8.126	8.302	8.992	9.167	9.341
	01PB	28.305	7.743	7.778	8.244	8.920	9.089	9.250
<u>PE1160404BB Spec Operations Tactical Systems Development</u>								
3284 SOF AIRCRAFT DEFENSIVE SYSTEM	00PB	6.540	8.783	10.321	13.053	7.388	5.292	3.329
	01PB	4.590	11.622	18.953	12.714	7.080	2.935	4.114
3326 AC-130U GUNSHIP	00PB	1.079	1.330	1.313	2.223	2.224	2.089	2.086
	01PB	1.079	1.289	1.305	2.209	2.206	2.071	2.065
D476 PSYOPS ADV DEV	00PB	.946	.865	1.137	.097	.298	.304	.310
	01PB	.261	.839	.316		.300	.305	1.732
D615 SOF AVIATION	00PB	7.194	7.448	10.697	4.028	17.583	3.721	.783
	01PB	9.292	7.219	13.413	4.000	17.442	2.697	.775
S0417 UNDERWATER SYSTEMS ADV DEV	00PB	62.091	18.284	9.455	9.330	10.688	5.418	5.090
	01PB	68.944	43.314	10.390	9.265	10.602	4.380	5.040
S1684 SOF SURFACE CRAFT ADVANCE SYSTEMS	00PB		4.869	7.657	8.041	5.514		
	01PB	.196	4.654	1.826	3.466	1.066	.580	1.486

RDT&E Programs - Comparison Report (Dollars in Millions)
 All Items in Budget Activity 7

FEBRUARY 2000

Program Element / Project	Submit	FY99	FY00	FY01	FY02	FY03	FY04	FY05
S350 SOFPARS	00PB	3.627	3.246	3.373	3.125	2.876	2.938	3.000
	01PB	4.024	3.147	3.352	3.103	2.853	2.665	3.615
S375 WEAPONS SYSTEMS ADV DEV	00PB	1.211	.890	.884	.574	3.996	4.684	.580
	01PB	.951	.862	.879	.570	3.468	4.644	.822
S500B SOF OPERATIONAL ENHANCEMENTS	00PB	5.965						
	01PB	5.965	8.095					
S625 SOF TRAINING SYSTEMS	00PB	21.461	10.886	9.585	19.244	1.907	1.894	
	01PB	22.798	9.190	8.731	19.110	1.892	1.878	
S700 SO COMMUNICATIONS ADV DEV	00PB	2.871	2.747	2.234	1.695	1.430	.719	.734
	01PB	2.118	2.662	3.571	3.849	2.742	3.027	3.040
S800 SO MUNITIONS ADV DEV	00PB	4.393	4.863	12.405	.816	.831	2.254	7.244
	01PB	4.348	4.712	11.849	.810	.824	1.283	4.543
S900 SO MISCELLANEOUS EQUIPMENT ADV DEV	00PB		.290	.501	.535			
	01PB		.282	.498	.531			
SF100 AVIATION SYSTEMS ADV DEV	00PB	4.467	26.076	24.372	49.528	48.476	36.158	37.642
	01PB	4.365	17.372	17.976	47.198	46.598	33.865	37.773
SF200 CV-22	00PB		16.094	38.818	39.539	34.603	10.386	9.789
	01PB		32.179	40.461	39.264	34.324	10.297	19.597
PE Subtotal:	00PB	121.845	106.671	132.752	151.828	137.814	75.857	70.587
	01PB	128.931	147.438	133.520	146.089	131.397	70.627	84.602

RDT&E Programs - Comparison Report (Dollars in Millions)
 All Items in Budget Activity 7

FEBRUARY 2000

<u>Program Element / Project</u>	<u>Submit</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>
<u>PE1160405BB Spec Operations Intelligence Systems Development</u>								
S400 SO INTELLIGENCE	00PB	8.793	1.407	2.899	1.366	1.395	1.533	1.686
	01PB	8.417	5.138	3.022	1.574	1.659	1.432	1.460
<u>PE1160407BB SOF Medical Technology Development</u>								
S275 SOF MEDICAL TECHNOLOGY	00PB	1.962	2.039	2.078	2.122	2.166	2.209	2.251
	01PB	1.945	3.863	2.065	2.107	2.149	2.190	2.229
<u>PE1160408BB SOF Operational Enhancements</u>								
S500A SOF OPERATIONAL ENHANCEMENTS	00PB	46.380	62.567	76.173	80.735	69.047	23.454	22.605
	01PB	39.179	61.739	87.071	91.029	81.070	34.996	36.050
RDT&E APPROPRIATION TOTALS:								
	00PB	215.207	187.767	229.734	252.679	228.371	121.354	115.796
	01PB	214.595	237.692	240.816	257.311	234.080	127.390	142.826

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE PE1160279BB Small Business Innovative Research						
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160279BB	4.068	4.896						Cont.	Cont.
S050 SMALL BUSINESS INNOVATIVE RESEARCH	4.068	4.896						Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>The Small Business Innovative Research (SBIR) program element consists of a highly competitive three- phase award system which provides qualified small business concerns with the opportunity to propose high quality innovative ideas that meet specific research and development needs of USSOCOM. SBIR is a result of the Small Business Development Act of 1992. It was enacted by Congress in Public Law 97-219, reenacted by Public Law 99-443, and reauthorized by the SBIR Program Reauthorization Act of 1992. Starting in FY 1994, the SBIR program was refocused toward dual use and defense reinvestment efforts. Phase I projects evaluate the scientific technical merit and feasibility of an idea. Awards are up to \$100,000 with a maximum six-month period of performance. Phase II projects expand the results of, and further pursue, the developments of Phase I. Awards are up to \$750,000 with a maximum two-year period of performance. Phase III is for commercialization of the results of Phase II and requires the use of private or non-SBIR federal funding. DOD publishes government agency proposal projects twice per year for a consolidated DOD Request for Proposal. USSOCOM then awards its proposed SBIR projects.</p> <p>Change Summary Explanation:</p> <p>Funding: FY 2000 increase is due to Congressionally-mandated reprogramming of USSOCOM's appropriated obligation authority into the SBIR program.</p> <p>Schedule: None</p> <p>Technical: None.</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7		R-1 ITEM NOMENCLATURE PE1160279BB Small Business Innovative Research		
B. Program Change Summary		FY 1999	FY 2000	FY 2001
Previous President's Budget		4.068		
Appropriated Value				
Adjustments to Appropriated Value / President's Budget			4.896	
Current Budget Submit		4.068	4.896	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE PE1160401BB Spec Operations Technology Development						
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160401BB	3.750	6.875	7.360	8.268	8.885	9.056	9.235	Cont.	Cont.
S100 SO TECHNOLOGY BASE DEV	3.750	6.875	7.360	8.268	8.885	9.056	9.235	Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>This program element conducts rapid prototyping and advanced technology demonstrations. It provides a means for demonstrating and evaluating emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces users. Evaluation results are included in a transition package which assists in the initiation of or insertion into an acquisition program. The program element also addresses projects that are a result of unique joint, special mission, or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase.</p> <p>Change Summary Explanation:</p> <p>Funding:</p> <p>FY 2000 decrease is project cost share of the Small Business Innovative Research program, Congressionally mandated rescission of \$23K, and revised Administration inflation assumptions.</p> <p>FY 2001 decrease is project cost share of revised Administration inflation assumptions.</p> <p>Schedule: None.</p> <p>Technical: None.</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7		R-1 ITEM NOMENCLATURE PE1160401BB Spec Operations Technology Development		
B. Program Change Summary		FY 1999	FY 2000	FY 2001
Previous President's Budget		3.750	7.093	7.706
Appropriated Value		4.026	7.093	
Adjustments to Appropriated Value / President's Budget		(.276)	(.218)	(.346)
Current Budget Submit		3.750	6.875	7.360

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development / Project S100							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S100, Special Operations Technology Development		3.750	6.875	7.360	8.268	8.885	9.056	9.235	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project conducts studies and develops laboratory prototypes for applied research and advanced technology development, as well as leverage other organizations' technology projects that may not otherwise be affordable within MFP-11. Applying small incremental amounts of investments to DOD, other government agencies, and commercial organizations allows the Commander-in-Chief USSOCOM to influence the direction of technology development or the schedule against which it is being pursued, and to acquire emerging technology for Special Operations Forces (SOF). This project provides an investment strategy for USSOCOM to link non-systems technology opportunities to USSOCOM deficiencies, capability objectives, technology development objectives and mission area analyses. Sub-projects include:

- Active Noise Cancellation. Reduce acoustic signature of SOF propeller craft.
- Color Night Vision Fusion. Develop broad spectrum sensors and fuse these sensors while incorporating SOF size, weight, and human factor requirements.
- Head-Mounted Thermal Vision. Lightweight, low-volume, low-power thermal viewer providing a passive night/obscured vision capability using an uncooled infrared focal plane array. This project leverages other government efforts.
- Low Probability of Intercept/Detection Imagery Forwarding. A high data-rate, secure server, long-range data transmission capability. This project leverages various commercial and government technology efforts.

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development / Project S100
<ul style="list-style-type: none"> • SOF) Clothing and Equipment. Peripheral sensor technologies to monitor status of an individual SOF operator and his equipment and to detect threats. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (0.725) SOF Command, Control, Communications, Computers and Intelligence (C4I) Technologies. Completed evaluation of Head-Mounted Thermal Vision. Completed development and began evaluation of SOF Color Night Vision Fusion device. Completed development of low probability of intercept/detection imagery forwarding and began evaluation. Exploited emerging C4I technologies to provide improvements in weight/volume reduction, support, power consumption/management, and enhanced antennae. Exploited technology efforts to demonstrate a capability for SOF to detect surveillance threats. (1QTR99-4QTR99) • (0.525) SOF Mobility Technologies. Completed development and began evaluation of the Active Noise Cancellation effort. Completed development of Integrated Bridge System subprojects. (1QTR99-3QTR99) • (0.708) SOF Sustainment Technologies. Completed development of and evaluated the FY98 sub-projects. Exploited technology to provide improvements in weight/volume reduction and increased power capabilities for the individual SOF operator. (1QTR99-4QTR99) • (0.350) Concept Exploration Studies. Explored/validated concepts for a precision guided canister bomb for leaflet delivery and concepts for a hydrographic reconnaissance littoral mapping device to support the Naval Special Warfare very shallow water mine countermeasures. (3QTR99-4QTR99) • (1.442) Classified Project. Provided under separate cover. (1QTR99-4QTR99) 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development / Project S100	
<p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (2.184) SOF Command, Control, Communications, Computers and Intelligence (C4I) Technologies. Complete evaluation and transition of Low Probability of Intercept/Detection Imagery Forwarding and SOF Color Night Vision Fusion devices. Complete development of and evaluate FY99 new sub-projects. Exploit technologies to provide SOF with improved situational awareness in all mission environments. Exploit technologies to provide significant improvements to SOF's capability to accurately detect and track threats or targets. (1QTR00-3QTR00) • (1.710) SOF Mobility Technologies. Complete evaluation and transition of Active Noise Cancellation effort. Complete development of and evaluate FY99 new sub-projects. Exploit technologies to improve the performance and reduce the detection of SOF mobility assets. Exploit technologies to provide SOF the capability to conduct undetectable ground, air and sea mobility operations in denied areas. (1QTR00-3QTR00) • (0.911) SOF Weapons Technologies. Initiate efforts to exploit technologies that provide SOF with stand-off capabilities for targeting, tracking and locating personnel and equipment. Exploit technologies to broaden the range and performance of SOF munition capabilities to support a variety of operations. (1QTR00-3QTR00) • (1.364) SOF Sustainment Technologies. Complete development and begin evaluation of threat detection devices for the individual SOF operator. Continue to exploit technologies to increase SOF's survivability and performance. Exploit technologies to improve the human sensory performance without interfering with normal sensory functions. Exploit technologies to provide SOF with a lightweight and accurate system to assess potential assault zone areas. Exploit information technologies to provide SOF with advanced mission planning and rehearsal capabilities. (1QTR00-3QTR00) 		

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development / Project S100
<ul style="list-style-type: none"> • (0.506) Concept Exploration Studies. Explore/validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities. (2QTR00) • (0.200) Technology Development Exploitation. Exploit technologies to meet critical Special Operations Forces (SOF) capability objectives. Requirements in these areas may be advertised to industry and government research and development agencies via broad area announcements and calls for white papers. (3QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (1.880) SOF Command, Control, Communications, Computers and Intelligence (C4I) Technologies. Complete development of FY 2000 new sub-projects. Continue to exploit technologies that provide SOF with improved situational awareness and communications in all environments. Develop technologies to provide significant improvements to SOF's capability to accurately detect and track threats or targets. Develop C4I technologies to support mission accomplishment with reality manipulation techniques. (1QTR01-3QTR01) • (1.803) SOF Mobility Technologies. Complete development of FY 2000 new sub-projects. Continue to exploit technologies to improve the performance and reduce the detection of SOF mobility assets. Continue to exploit and develop technologies to provide SOF the capability to conduct undetectable ground, air, and sea mobility operations in denied areas. (1QTR01-3QTR01) • (1.102) SOF Weapons Technologies. Complete development of FY 2000 new sub-projects. Continue to exploit technologies to provide SOF with stand-off capabilities for targeting, tracking and locating personnel and equipment. Exploit technologies to discriminate targets and provide real-time active decision making capabilities. Exploit technologies to reduce weapon overpressure in support of SOF missions. (1QTR01-3QTR01) 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development / Project S100	
<ul style="list-style-type: none"> • (1.856) SOF Sustainment Technologies. Complete development of FY 2000 new sub-projects. Continue to exploit technologies to increase SOF's survivability and performance. Continue to exploit technologies to improve the human sensory performance without interfering with normal sensory functions. (1QTR01-3QTR01) • (0.519) Concept Exploration Studies. Explore/validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities. (2QTR01) • (0.200) Technology Development Exploitation. Exploit technologies to meet critical SOF capability objectives. Requirements in these areas may be advertised to industry and government research and development agencies via broad area announcements and calls for white papers. (3QTR01) <p>B. <u>Other Program Funding Summary</u>: None.</p> <p>C. <u>Acquisition Strategy</u>: None.</p> <p>D. <u>Schedule Profile</u>: None.</p>		

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE PE1160402BB Spec Operations Advanced Technology Development						
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160402BB	28.305	7.743	7.778	8.244	8.920	9.089	9.250	Cont.	Cont.
S200 SPECIAL OPERATIONS SPECIAL TECHNOLOGY	28.305	7.743	7.778	8.244	8.920	9.089	9.250	Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>This program element conducts rapid prototyping and advanced technology demonstrations. It provides a means for demonstrating and evaluating emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces users. Evaluation results are included in a transition package which assists in the initiation of or insertion into an acquisition program. The program element also addresses projects that are a result of unique joint, special mission, or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase.</p> <p>Change Summary Explanation:</p> <p>Funding:</p> <p>FY 2000 decrease is project cost share of the Small Business Innovative Research program, Congressionally mandated rescission of \$23K, and revised Administration inflation assumptions.</p> <p>FY 2001 decrease is project cost share of revised Administration inflation assumptions.</p> <p>Schedule: None.</p> <p>Technical: None.</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE		
		FEBRUARY 2000		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE PE1160402BB Spec Operations Advanced Technology Development			
B. Program Change Summary	FY 1999	FY 2000	FY 2001	
Previous President's Budget	28.409	7.990	8.126	
Appropriated Value	29.020	7.990		
Adjustments to Appropriated Value / President's Budget	(.715)	(.247)	(.348)	
Current Budget Submit	28.305	7.743	7.778	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200						

COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S200, Special Operations Special Technology	28.305	7.743	7.778	8.244	8.920	9.089	9.250	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project conducts rapid prototyping and Advanced Technology Demonstrations (ATDs). It provides a means for demonstrating and evaluating emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces (SOF) users. Evaluation results are included in a transition package which assists in the initiation of or insertion into an acquisition program. The project also addresses sub-projects that are a result of unique joint, special mission, or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase. Sub-projects include:

- Advanced Sensors. ATD to provide SOF with an integrated hand-held, multi-sensor reconnaissance capability to observe, locate, and report on targets.
- Advanced Sniper Weapon Fire Control. Full wind vector ballistic solution at extended range (1200 meters).
- Aircraft Off/On Load System. Demonstrate system to air drop platforms or SOF-unique pallets without the use of material handling equipment.
- Integrated Bridge System. A system that enhances maritime craft bridge-console and operator interface through human factor engineering and integration with console design and displays.
- Intrusion Sensor. A miniature, multi-sensor system to detect local threats.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200
<ul style="list-style-type: none"> • Low Probability of Intercept/Detection Imagery Link. Demonstrate a short range, high data rate, networked communications link for SOF applications. • Maximum Efficiency Language Trainer. Demonstrate an advanced computer based virtual reality interactive language tutor for SOF applications. • Quick Erect Antenna. Improved antenna to reduce set-up time requirements in support of psychological operations. • Remote Miniature Weather Station. Man-portable, air-drop capable weather sensors with a transmission system for terrestrial based unattended weather collection operations. • SOF Autonomous Landing System. Demonstrate the capability to provide navigation guidance for SOF aircraft approaching a landing field in adverse weather. • SOF Enhanced Weapons. Weapons and munitions prototypes for increased range, improved accuracy, and improved performance against hardened targets. • SOF Robotics. Leverage air, ground, and maritime robotics technology for SOF evaluations to determine operational utility. • Tactical Personal Computer. Demonstrate advanced wearable computer technology for SOF special reconnaissance and combat control team applications. • Underwater Adhesives. Demonstrate advanced adhesive technologies for emplacing underwater demolitions. 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200
<p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (2.910) SOF Command, Control, Communications, Computer and Intelligence Technologies. Continued demonstration of Tactical Personal Computer for SOF applications. Continued to exploit emerging technology to conduct Advanced Technology Demonstrations (ATDs) that provide improvements in weight/volume reduction, power consumption/management, low probability of intercept/detection, and transmission rates of SOF communication and intelligence systems. Continued to exploit emerging technology to conduct ATDs that provide SOF with improvements in their ability to detect, track, and maintain surveillance of threats. Continued to exploit technology to provide SOF with increased situation/information awareness and intelligence awareness during missions. (1QTR99-4QTR99) • (1.250) SOF Mobility Technologies. Completed development and user evaluation, and began transition of Integrated Bridge System and Aircraft off/on Load System. Completed development and evaluation of SOF Autonomous Landing System. Exploited emerging robotics technology to assess for SOF operational utility. (1QTR99-4QTR99) • (1.946) SOF Weapons Technologies. Completed development of and evaluated Advanced Sniper Weapon Fire Control and SOF Enhanced Weapons. Continued to exploit emerging technologies to conduct ATDs that provide increased lethality, enhanced flexibility, reduced weight and volume, increased accuracy, controllability, and safety of explosive charges and weapons. Continued to exploit emerging technology to conduct ATDs that provide SOF weapons with improvements in the responsiveness, stand-off, accuracy, reliability, and target effects. Obtained weapon classification and prepared for low rate initial production of the Advanced Lightweight Grenade Launcher. Evaluated Underwater Adhesives for attaching SOF munitions. (1QTR99-4QTR99) • (1.442) SOF Sustainment Technologies. Completed evaluation and transition of Maximum Efficiency Language Trainer. Continued development and evaluation of Intrusion Sensor System. Continued to exploit emerging technologies to conduct ATDs that will provide enhanced performance and sustainment of power devices for the individual SOF operator. Exploited emerging technology to conduct ATDs that provide SOF combat swimmers with improved mission readiness. (1QTR99-4QTR99) 	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200
<ul style="list-style-type: none"> • (0.500) Technology Exploitation Initiative. Leveraged Air Force advanced non-lethal technology for SOF applications. (4QTR99) • (0.729) Classified Project. Provided under separate cover. (1QTR99-4QTR99) • (19.528) Special Reconnaissance Capabilities (SRC). Special Reconnaissance (SR) is a core USSOCOM mission. The SRC effort addresses technology shortfalls for SR and consists of multiple, interrelated projects focusing on the development of components for integration into intelligence, surveillance, and reconnaissance systems and architectures. (2QTR99-4QTR00) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (2.150) SOF Command, Control, Communications, Computer and Intelligence (C4I) Advanced Technology Demonstrations (ATDs). Complete development of and evaluate Low Probability of Intercept/Detection Imagery Link. Continue to exploit emerging robotics technology for SOF applications. Exploit emerging technology to conduct ATDs that provide SOF with a robust C4I capability to ensure uninterrupted information exchange, influence situations to support mission accomplishment, and reduce an adversary's ability to use information. Exploit emerging technology to conduct ATDs that provide SOF with a restricted line-of-sight personnel locator system. (1QTR00-3QTR00) • (1.905) SOF Mobility ATDs. Complete evaluation and transition of SOF Autonomous Landing System. Continue to exploit emerging technology to conduct ATDs that provide SOF with survivable mobility operations in high threat areas and enhanced situational awareness. Exploit emerging technology to conduct ATDs that provide SOF mobility assets with enhanced situational awareness and beyond line-of-sight threat detection. (1QTR00-2QTR00) • (1.002) SOF Weapons ATDs. Complete evaluation and transition of Advanced Sniper Weapon Fire Control. Complete development of FY 1999 new sub-projects to completion and evaluation. Exploit emerging technology to conduct ATDs that provide SOF with a man-portable system to detect enemy indirect fire systems. (1QTR00-2QTR00) 	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200
<ul style="list-style-type: none"> • (1.586) SOF Sustainment Advance Technology Demonstrations (ATDs). Complete development of and evaluate FY 1999 new sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with increased survivability and performance. (2QTR00-3QTR00) • (0.500) Technology Exploitation Initiative. Exploit emerging technologies to meet critical SOF requirements and encourage industry and government lab participation in identifying enhancements to SOF in critical areas. (3QTR00) • (0.600) Classified Project. Provided under separate cover. (1QTR00-2QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (2.210) SOF Command, Control, Communications, Computer and Intelligence (C4I) ATDs. Complete development of and evaluate FY 2000 new sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with a robust C4I capability to ensure uninterrupted information exchange, influence situations to support mission accomplishment, and reduce an adversary's ability to use information. Exploit emerging technology to conduct ATDs that provide SOF with increased sensory performance. Exploit emerging technologies to locate and track targets or items of interest. (1QTR01-3QTR01) • (2.140) SOF Mobility ATDs. Complete development of and evaluate FY 2000 new sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with survivable mobility operations in high threat areas and with enhanced situational awareness. Exploit emerging technologies to conduct ATDs that provide SOF mobility assets with a reduction in logistic support requirements. Exploit emerging technologies to rapidly deploy and extract SOF personnel and craft. Exploit technologies to allow reconnaissance and conduct direct action in high threat areas using unmanned systems. (2QTR01-3QTR01) 	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160402BB Special Operations Advanced Technology Development / Project S200
<ul style="list-style-type: none"> • (1.709) SOF Weapons Advanced Technology Demonstrations (ATDs). Complete development of and evaluate FY 2000 new sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with multi-role/multi-purpose weapons and demolitions with a broader range of potential effects and increased accuracy. (1QTR01-3QTR01) • (1.219) SOF Sustainment ATDs. Continue development of and evaluate FY 2000 new sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with increased survivability and performance. (1QTR01-3QTR01) • (0.500) Technology Exploitation Initiative. Exploit emerging technology to meet critical SOF requirements and encourage industry and government lab participation in identifying enhancements to SOF in critical areas. (3QTR01) <p>B. <u>Other Program Funding Summary</u> None.</p> <p>C. <u>Acquisition Strategy</u>: None.</p> <p>D. <u>Schedule Profile</u> None.</p>	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7		R-1 ITEM NOMENCLATURE PE1160404BB Spec Operations Tactical Systems Development							
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160404BB	128.931	147.438	133.520	146.089	131.397	70.627	84.602	Cont.	Cont.
3284 SOF AIRCRAFT DEFENSIVE SYSTEM	4.590	11.622	18.953	12.714	7.080	2.935	4.114	Cont.	Cont.
3326 AC-130U GUNSHIP	1.079	1.289	1.305	2.209	2.206	2.071	2.065	Cont.	Cont.
D476 PSYOPS ADV DEV	.261	.839	.316		.300	.305	1.732	Cont.	Cont.
D615 SOF AVIATION	9.292	7.219	13.413	4.000	17.442	2.697	.775	Cont.	Cont.
S0417 UNDERWATER SYSTEMS ADV DEV	68.944	43.314	10.390	9.265	10.602	4.380	5.040	Cont.	Cont.
S1684 SOF SURFACE CRAFT ADVANCE SYSTEMS	.196	4.654	1.826	3.466	1.066	.580	1.486	Cont.	Cont.
S350 SOFPARS	4.024	3.147	3.352	3.103	2.853	2.665	3.615	Cont.	Cont.
S375 WEAPONS SYSTEMS ADV DEV	.951	.862	.879	.570	3.468	4.644	.822	Cont.	Cont.
S500B SOF OPERATIONAL ENHANCEMENTS	5.965	8.095						Cont.	Cont.
S625 SOF TRAINING SYSTEMS	22.798	9.190	8.731	19.110	1.892	1.878		Cont.	Cont.
S700 SO COMMUNICATIONS ADV DEV	2.118	2.662	3.571	3.849	2.742	3.027	3.040	Cont.	Cont.
S800 SO MUNITIONS ADV DEV	4.348	4.712	11.849	.810	.824	1.283	4.543	Cont.	Cont.
S900 SO MISCELLANEOUS EQUIPMENT ADV DEV		.282	.498	.531				Cont.	Cont.
SF100 AVIATION SYSTEMS ADV DEV	4.365	17.372	17.976	47.198	46.598	33.865	37.773	Cont.	Cont.
SF200 CV-22		32.179	40.461	39.264	34.324	10.297	19.597	Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>This program element provides for development, testing, and integration of specialized equipment to meet the unique requirements of Special Operations Forces (SOF). Specialized equipment will permit small, highly trained forces to conduct required operations across the entire spectrum of conflict. These operations are generally conducted in harsh environments, for unspecified periods and in locations requiring small unit autonomy. SOF must infiltrate by land, sea, and air to conduct unconventional warfare, direct action, or deep reconnaissance operations in denied areas against insurgent units, terrorists, or highly sophisticated threat forces. The requirement to operate in denied areas controlled by a</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE PE1160404BB Spec Operations Tactical Systems Development
<p>sophisticated threat mandates that SOF systems remain technologically superior to threat forces to ensure mission success.</p> <p>Change Summary Explanation:</p> <p>Funding FY 2000:</p> <p>Increase is a net result of additional funds appropriated by Congress for CV-22 (\$9.0M), Advanced Sea, Air, Land (SEAL) Delivery System (ASDS) (\$26.1M) and Small Craft Propulsion (\$2.5M), as well as reductions for project cost share of the Small Business Innovative Research program, Congressionally-mandated rescission of \$873K, and revised Administration inflation assumptions.</p> <p>Funding FY 2001:</p> <p>All projects were reduced by their cost share of revised Administration inflation assumptions. In addition, the following increases/decreases occurred.</p> <p>Project 3284: Increase of \$8.6M reflects a restructure of the C-130 Engine Infrared Suppression program.</p> <p>Project D476: Decrease of \$0.8M based on better definition of program requirements for Leaflet Delivery System Variant I.</p> <p>Project D615: Increase of \$2.7M is a net result of continued prototype testing of the Mission Enhancement Little Bird aircraft and technical risk associated with modifications of modular avionics on SOF Rotary Wing platforms.</p> <p>Project S0417: Increase of \$0.9M is a net result of an increase to reduce vulnerability characteristics of the ASDS (e.g., noise reduction).</p> <p>Project S1684: Decrease of \$5.8M reflects a restructuring of the Special Operations Craft-Riverine and Naval Special Warfare Rigid Inflatable Boat programs.</p> <p>Project S625: Decrease of \$0.8M reflects USSOCOM realignment of resources to support higher command priorities.</p>	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2000		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE PE1160404BB Spec Operations Tactical Systems Development		
<p>Project S700: Increase of \$1.3M reflects initiation of the Mission Planning, Analysis, Rehearsal and Execution program.</p> <p>Project S800: Decrease of \$0.6M reflects USSOCOM realignment of resources to support higher command priorities.</p> <p>Project SF100: Decrease of \$6.5M reflects realignment of resources due to technical risk associated with CV22, ASDS, and Avionics/Navigation Modifications.</p> <p>Project SF200: Increase of \$1.6M reflects realignment of resources due to associated technical risk.</p> <p>Schedule:</p> <p>Project 3284: C-130 Engine Infrared Suppression program was restructured; developmental testing/initial operational testing and evaluation is now scheduled for FY 2001.</p> <p>Project S0417: First ASDS vehicle will be delivered FY 2000. Milestone III for Non-Gasoline Burning Outboard Engine is scheduled for 3QTR00.</p> <p>Technical: None.</p>			
<p>B. Program Change Summary</p> <p>Previous President's Budget</p> <p>Appropriated Value</p> <p>Adjustments to Appropriated Value / President's Budget</p> <p>Current Budget Submit</p>	<p>FY 1999</p> <p>121.845</p> <p>107.738</p> <p>21.193</p> <p>128.931</p>	<p>FY 2000</p> <p>106.671</p> <p>150.270</p> <p>(2.832)</p> <p>147.438</p>	<p>FY 2001</p> <p>132.752</p> <p></p> <p>.768</p> <p>133.520</p>

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3284						

COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
3284, SOF Aircraft Defensive Systems	4.590	11.622	18.953	12.714	7.080	2.935	4.114	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides definition, development, prototyping and testing of aircraft defensive avionics systems. Project identifies hardware and software enhancements for each Special Operations Forces (SOF) aircraft that will reduce detection, vulnerability, and threat engagement from threat radars thereby increasing the overall survivability of SOF assets. This project identifies and develops enhancements to each platform to meet the projected threat. Recommendations for equipment modification or replacement will be developed by each system program manager based upon the results of ongoing engineering assessments and user operational requirements. This project funds dispenser upgrade and improvement programs, threat and missile warning receiver enhancements, radio frequency (RF) jammer improvements, and development of AC-130 engine infrared (IR) suppression system and IR jamming system. Project also provides systems for SOF-unique portions of the Warner Robins-Air Logistics Center Electronic Warfare Avionics Integrated Systems Facility. Sub-projects include:

- ALQ-172 Electronic Countermeasures/Engineering Change Proposal (ECP)-93 (AC-130H/U, MC-130E/H): Modification of the ALQ-172 RF jammer which improves capability by adding low band jamming coverage for eight AC-130H aircraft. In addition, program funds ECP-93 which provides for flightline reprogramming capability, and increases memory and growth for continuous wave countermeasures for AC-130H/U and MC-130E/H aircraft.
- C-130 Engine IR Suppression (AC-130H/U, MC-130E/H, HC-130P/N, EC-130E): Program to develop and install an engine IR signature suppression system on all AFSOC C-130 aircraft. The system will reduce the IR signature of these aircraft, thereby reducing their susceptibility to generation I and II IR missile threats.

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3284	
<ul style="list-style-type: none"> • APR-46 Radar Warning Modification. Program funds for an Analysis of Alternatives to determine the optimal solution for current APR-46 deficiencies. • Directional Infrared Countermeasures (DIRCM). A joint international cooperative United Kingdom (UK)/United States (US) project to develop an infrared (IR) jammer for MC-130E/H and AC-130H/U aircraft capable of countering missile threats in the band one, two and four IR frequency spectrum. • Electronic Warfare Avionics Integrated Systems Facility (EWAISF). The EWAISF directly supports software development and testing. The EWAISF effort is a type of systems integration laboratory designed to support the incorporation of SOF aircraft defensive systems modifications into specific SOF platforms. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (0.262) ALQ-172 Electronic Countermeasures. Continued test and program management support of the ALQ-172 low band jammer. (1QTR99-4QTR99) • (3.128) DIRCM. Continued DIRCM development. Completed flight and live fire testing. Continued to support a cooperative UK/US development/production program for 59 SOF C-130 aircraft. Achieved Milestone III in 4QTR99. (1QTR99-4QTR99) • (1.200) EWAISF. Integrated AAR-44 software support station components into EWAISF. (2QTR99) 		

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3284	
<p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (5.833) C-130 Engine Infrared (IR) Suppression. Award engineering and manufacturing development (EMD) contract. Fabricate production representative flight test suppression system. (1QTR00-4QTR00) • (4.047) Directional Infrared Countermeasures (DIRCM). Continue to support a cooperative UK/US development production program for 59 SOC C-130 aircraft. Continue to fund non-recurring engineering costs for development of a laser upgrade insert for the DIRCM for MC-130H Combat Talon II and AC-130U Gunship models. (1QTR00-4QTR00) • (1.742) Electronic Warfare Avionics Integrated Systems Facility (EWAISF). Support Multi-mission Advanced Tactical Terminal (MATT) laboratory efforts to include update of the Integrated Electronic Warfare Support Station (IEWS) and support IEWS/MATT correlation effort and modify Electro-optical/Infrared scene database for existing scene generator. (2QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (9.648) C-130 Engine IR Suppression. Conduct Developmental Testing /Initial Operational Test & Evaluation, complete EMD, support the flight test program, and prepare for Milestone III. (1QTR01-4QTR01) • (7.791) DIRCM. Continue to support a cooperative UK/US development production program for 59 SOC C-130 aircraft. Continue to fund non-recurring engineering costs for development of a laser upgrade insert for the DIRCM for MC-130H Combat Talon II and AC-130U Gunship models. Begin Operational Test & Evaluation for MC-130E/H Combat Talon II and AC-130H/U Gunship models. (1QTR01-4QTR01) • (1.514) EWAISF. Continue to support laboratory efforts to include update of the DIRCM evaluation tool for the IEWS. (2QTR01) 		

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE	FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3284		

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	<u>To Complete</u>	<u>Total Cost</u>
PROC, C130 Mods									
ALQ-172 Low Band Jammer	21.901	7.774						Cont.	Cont.
C130 Infrared (IR) Suppression				14.841	14.875			Cont.	Cont.
Directional Infrared Countermeasures (DIRCM)	7.700	66.486			23.144	22.134	8.645	Cont.	Cont.

C. Acquisition Strategy:

- C-130 Engine IR Suppression. Produce request for proposals and competitively select up to two contractors to enter engineering and manufacturing development. Downselect to one contractor after flight testing production representative suppression systems (post critical design review). This program is a continuing effort, based upon lessons learned, of a previous suppression program. A market survey was done (to minimize risk) which proved the maturity of the technology that is available in the industry today.
- DIRCM. The memorandum of agreement between the UK/US established the cooperative international DIRCM program. The UK Ministry of Defense is the lead for the program. UK law applies to all acquisition actions. USSOCOM program manager is the US Deputy to the UK DIRCM program manager.
- Electronic Warfare Avionics Integrated Systems Facility (EWAISF). Award sole source contracts to the manufacturer of the prime mission equipment required for hardware and software integration into the EWAISF.

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000											
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3284											
					<u>FY99</u>		<u>FY00</u>				<u>FY01</u>					
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4
C-130 Engine Infrared Suppression																
EMD Contract Award											x					
Developmental Testing/Initial Operational Testing & Evaluation																x
Directional Infrared Countermeasures																
Production Decision (MS III)								x								
AC-130H/U and MC-130E/H Operational Test and Evaluation													x	x	x	
Electronic Warfare Avionics Integrated Systems Facility																
Contract award for EO/IR Scene DEV										x						
Contract award for IEWS/MATT Correlation										x						
Laboratory Testing and Evaluation													x	x	x	x

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT 3284							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev											
Directional Infrared Countermeasures (DIRCM)	SS/FFP	Northrop (Chicago)	76.813	0.694	JUL 99	1.533	JUN 00	1.000	OCT 00	Cont.	Cont.
Sust Engineering DIRCM	SS/CPFF	Northrop (Chicago)				0.490	APR 00			Cont.	Cont.
Infrared Suppression System	TBD	TBD				5.657	MAY 00	8.091	OCT 00	Cont.	Cont.
LASER	TBD	Northrop (Chicago)				1.000	JUN 00	5.800	OCT 00	Cont.	Cont.
AAR-44	SS/CPIF	Cinn. Electronics, OH	12.363								Cont.
Electronics Warfare Avionics Integrated Systems Facility	SS/TBD	GTRI, GA	6.760	1.200	FEB 99	1.742	MAR 00	1.514	MAR 01	Cont.	Cont.
Subtotal Product Dev			95.936	1.894		10.422		16.405		Cont.	Cont.
Remarks:											
Dev Spt											
Software Spt											
Training Dev											
Integrated Logistics Spt											
Configuration Management											
Technical Data											
GFE											
Subtotal Spt											
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT 3284							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Devel Test & Eval	MIPR	WSMR/46TW/Other (DIRCM)	11.057	1.990	JUN 99					Cont.	Cont.
	MIPR	46TW/Other (EIRS)						1.488	MAR 01	Cont.	Cont.
Subtotal T&E			11.057	1.990				1.488		Cont.	Cont.
Remarks:											
Contractor Engineering Spt	FP	BAH (DIRCM/EIRS) LASER	15.405			1.100	OCT 99	1.060	OCT 00	Cont.	Cont.
	SS/FFP	MTI; Warner Robins, Ga	4.820							Cont.	Cont.
Government Engineering Spt	SS/CPFF	SSAI; Warner Robins, Ga	2.969	0.203	JUL 99					Cont.	Cont.
	MIPR	Crane DIV/other		0.184	OCT 98					Cont.	Cont.
Travel	N/A		1.000	0.319	N/A	0.100	N/A			Cont.	Cont.
Subtotal Management			24.194	0.706		1.200		1.060		Cont.	Cont.
Remarks:											
Total Cost			131.187	4.590		11.622		18.953		Cont.	Cont.
Remarks:											

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3326							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
3326, AC-130U		1.079	1.289	1.305	2.209	2.206	2.071	2.065	Cont.	Cont.
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project provides aircraft subsystems including precision navigation, target acquisition and strike radar, fire control computers integrated on redundant MIL-STD-1553B data buses, electronic countermeasures, infrared countermeasures, aerial refueling, covert lighting, trainable weapons, all light level television, infrared sensor, and secure communications systems. The AC-130U aircraft will be more capable and survivable than the existing AC-130H aircraft. These subsystems enable the gunship to strike targets with surgical accuracy, to loiter safely in the target area for extended periods, and to perform these tasks at night and in adverse weather conditions. Every effort has been made to adapt off-the-shelf equipment. To the maximum extent possible, the subsystems in the AC-130U are common with systems on other Air Force Special Operations Command aircraft. AC-130U software is developed and sustained using a systems integration laboratory.</p> <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (0.338) Developed prototypes and risk reduction efforts for control and display subsystem improvements. (1QTR99) • (0.429) Continued reliability and maintainability technical studies and analyses. Continued control and display analyses. (1QTR99) • (0.008) Continued mission support (system safety support). (4QTR99) • (0.120) Continued effort on technical order verification/validation and printing. (3QTR99) • (0.184) Continued annual software flight test operations and support. (4QTR99) 										

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3326	
<p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (0.406) Begin rehosting the system integration laboratory assets to new Ada software compiler. (1QTR00) • (0.425) Begin cooperative effort with AF laboratory to analyze and demonstrate related emerging technologies. (1QTR00) • (0.044) Continue development of depot level support equipment. (1QTR00) • (0.216) Continue technical order verification/validation and printing. (3QTR00) • (0.198) Continue annual software flight test operations and support. (3QTR00-4QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (0.666) Complete system integration laboratory rehost effort. (1QTR01) • (0.050) Continue cooperative effort with AF laboratory to analyze and demonstrate gunship related emerging technologies. (1QTR01) • (0.218) Continue technical order verification/validation. (3QTR01) • (0.371) Continue annual software flight test operations and support. (3QTR01-4QTR01) 		

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7						R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project 3326																																																																																																		
<p>B. <u>Other Program Funding Summary</u></p> <table border="0"> <thead> <tr> <th></th> <th><u>FY99</u></th> <th><u>FY00</u></th> <th><u>FY01</u></th> <th><u>FY02</u></th> <th><u>FY03</u></th> <th><u>FY04</u></th> <th><u>FY05</u></th> <th>To <u>Complete</u></th> <th>Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>PROC, AC-130U</td> <td>23.031</td> <td>26.602</td> <td>13.871</td> <td>12.063</td> <td>8.750</td> <td>6.770</td> <td>5.758</td> <td>Cont.</td> <td>Cont.</td> </tr> </tbody> </table>															<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>	PROC, AC-130U	23.031	26.602	13.871	12.063	8.750	6.770	5.758	Cont.	Cont.																																																																							
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PROC, AC-130U	23.031	26.602	13.871	12.063	8.750	6.770	5.758	Cont.	Cont.																																																																																															
<p>C. <u>Acquisition Strategy:</u></p> <ul style="list-style-type: none"> Modify C-130H airframe into a side-firing configuration on a sole-source fixed price incentive fee development contract. Conduct a combined qualification test and evaluation/qualification operational test and evaluation (QOT&E), and a dedicated QOT&E. The AC-130U is logistically supported at organizational, intermediate and depot levels via interim contractor support until organic support is established. Initial operational capability occurred in March 1996, and full operational capability is scheduled for FY 2001. 																																																																																																								
<p>D. <u>Schedule Profile</u></p> <table border="0"> <thead> <tr> <th></th> <th colspan="4"><u>FY99</u></th> <th colspan="4"><u>FY00</u></th> <th colspan="4"><u>FY01</u></th> </tr> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Initial Operational Capability: Mar 1996</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Final Aircraft Delivery: Mar 1997</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>System Integration</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td> </tr> <tr> <td>SoftwareTest and Evaluation</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td> </tr> <tr> <td>Full Operational Capability</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td></td><td></td> </tr> </tbody> </table>															<u>FY99</u>				<u>FY00</u>				<u>FY01</u>					1	2	3	4	1	2	3	4	1	2	3	4	Initial Operational Capability: Mar 1996													Final Aircraft Delivery: Mar 1997													System Integration										x	x	x	SoftwareTest and Evaluation											x	x	Full Operational Capability										x		
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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT 3326							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Product Dev											
Software	C/CPIF	Boeing, Ft Walton Beach, FL	Note 1			0.406	NOV 99	0.666	NOV 00	Cont.	Cont.
Studies & Analysis	C/CPAF	Boeing, Ft Walton Beach, FL	Note 1	0.429	NOV 98						0.429
Support Equipment	C/CPFF	DME, Orlando, FL	Note 1			0.044	NOV 99				0.044
Tech Order Ver & Val	VARIOUS	VARIOUS	Note 1	0.120	VARIOUS	0.216	VARIOUS	0.218	VARIOUS	Cont.	Cont.
Subtotal Product Dev				0.549		0.666		0.884		Cont.	Cont.
Remarks:											
Note 1: Prior year costs have not been tracked in these cost categories.											
Dev Spt	PO	AF Res Lab Wright-Patterson AFB, OH	0.224	0.205	DEC 98	0.425	VARIOUS	0.050	DEC 00	Cont.	Cont.
Subtotal Spt			0.224	0.205		0.425		0.050		Cont.	Cont.
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT 3326							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Devel Test & Eval	PO	46 Test Wing, Eglin AFB, FL	34.493	0.192	AUG 99	0.198	AUG 00	0.371	AUG 01	Cont.	Cont.
Subtotal T&E			34.493	0.192		0.198		0.371		Cont.	Cont.
Remarks:											
Management A&AS	C/CPFF	VARIOUS		0.133	JUN 99						0.133
Subtotal Management				0.133							0.133
Remarks:											
Total Cost			34.717	1.079		1.289		1.305		Cont.	Cont.
Remarks:											

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000						
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project D615								
COST (Dollars in Millions)			FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
D615, SOF Aviation			9.292	7.219	13.413	4.000	17.442	2.697	.775	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides aviation support to Special Operations Forces (SOF) in world-wide contingency operations and low-intensity conflicts. The specialized aircraft for these missions must be capable of rapid deployment and undetected penetration of hostile areas. These aircraft must be capable of operating at extended ranges under adverse weather conditions to infiltrate, provide logistics for, reinforce, and extract SOF. The threat is characterized by an extensive and sophisticated ground based air defense system and an upgraded air-to-air capability targeted against helicopters. Third World operations are apt to involve greater distances and more challenging geographical environmental conditions than the European theater. This project will develop/upgrade the Special Operations rotary wing aircraft systems that will be capable of successful operations in these increasingly hostile environments. Rotary wing systems supported by this project include: A/MH-6, MH-60G/L/K, MH-53J, TH-53A, and MH-47D/E. Efforts include:

- A/MH-6. (1) Develops lightweight, rapid reconfigurable mission support equipment. (2) Prototypes and tests structural fuselage modifications to increase the maximum gross weight by 25%.
- MH-47/MH-60K. (1) Develops and tests aircraft survivability equipment hardware and software. (2) Develops and tests the MH-60 fuel control system, conducts Congressionally-mandated Live Fire testing on the MH-47E and MH-60K, develops and tests ballistically tolerant composite small arms protection system for vulnerable helicopter systems. (3) Develops and tests cockpit, hardware, and software improvements to communication and navigation systems. (4) Develops, procures and installs a system that inerts (exchanging oxygen with nitrogen) in the main and auxiliary fuel tanks to improve survivability from small arms fire.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project D615
<p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (5.182) MH-47/MH-60. Continued development of onboard inert gas generation system. Started development and integration of Aircraft Survivability Equipment countermeasures. Started integration and testing of an infrared exhaust suppressor on the MH-47 helicopter. (1QTR99-4QTR99) • (0.970) MH-47/MH-60. Initiated development of the weather radar drop-in card for the Multi-Mode Radar for the MH-47E and MH-60K. Initiated study for integration of new mission processors, multi-function displays and avionics. (1QTR99-4QTR99) • (3.140) A/MH-6. Continued development of lightweight, rapid reconfigurable mission support equipment. (1QTR99-2QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (2.941) MH-47/MH-60. Initiate combined Integrated Infrared Countermeasures (IRCM) and Suite of IRCM; integration to treat infrared MH-47 and MH-60 countermeasures as a single integrated program. Provides for testing and installation of fixes. Funds integration of 200-gallon internal auxiliary fuel tank for 1/160 MH-60 aircraft. Continues Ballistic Protection System (BPS) (formerly Small Arms Protection System). Additional funding provides BPS modification of aircraft. (1QTR00-4QTR00) • (1.408) A/MH-6. Funds provide for the integration of the Allison 250-C30/R3 engine, and Full Authority Digital Electronic Control software refinement into the Mission Enhancement Little Bird (MELB) aircraft. Provide extensive Electromagnetic Interference/Electromagnetic Countermeasure testing for the MELB aircraft. This includes shipboard compatibility, full certification at the Dahlgren facility and additional shielding/protection for the aircraft systems. Partially replace large single functional analog components with fleet common miniaturized, lightweight multifunctional reconfigurable displays for flight, navigation, communication and weapons systems management. (1QTR00-4QTR00) 	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project D615
<ul style="list-style-type: none"> • (2.870) MH-47/MH-60. Incorporate cost to rehost Integrated Avionics System software into new mission processor. Incorporate Global Positioning System/Inertial Navigation System (GPS/INS) into the MH-47E and MH-60K aircraft. Develop and provide for installation of weather radar mode and incorporation of extensive Electromagnetic Interference/Electromagnetic Countermeasures (EMI/EMC) and electromagnetic vulnerability fixes. (1QTR00-4QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (2.978) MH-47/MH-60. Continue combined Integrated Infrared Countermeasures (IRCM) and Suite of IRCM ; integration to treat MH-47 and MH-60 fleet infrared countermeasures as a single integrated program. Continue testing and installation of Aircraft Survivability Equipment fixes. Initiate development, integration and testing of Nuclear, Biological and Chemical (NBC) crew protection system and NBC point detection system. (1QTR01-4QTR01) • (4.081) A/MH-6. Continue prototype testing of the Mission Enhancement Little Bird (MELB) aircraft. Continue to provide for the integration of the Allison 250-C30/R3 engine, and Full Authority Digital Electronic Control software refinement into the MELB aircraft. Continue to provide for EMI/EMC testing for the MELB aircraft. This includes shipboard compatibility and certification at the Dahlgren facility and additional shielding/protection for the aircraft systems. Continue to replace large single functional analog components with fleet common miniaturized, lightweight multifunctional reconfigurable displays for flight, navigation, and communication and weapon systems management. (1QTR01-4QTR01) • (3.834) MH-47/MH-60. Continue to provide funds to rehost Integrated Avionics System software onto new mission processor. Provide for Modular Avionics testing. Program incorporates modularized avionics and open systems computer architecture. (1QTR01-4QTR01) • (2.520) MH-47/MH-60. Fund modification of Army Aircraft Command and Control antenna pack to conform to existing SOF-unique configuration. Incorporate GPS/INS to meet mandated national airspace requirements. Integrate into all MH-47 and MH-60 aircraft. Continue development and 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project D615

procurement/installation of weather radar mode and incorporation of Electromagnetic Interference/Electromagnetic Countermeasures (EMI/EMC) and electromagnetic vulnerability fixes. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, Rotary Wing Upgrades & Sustainment	44.777	81.560	68.480	31.686	35.140	48.854	69.557	Cont.	Cont.

C. Acquisition Strategy: None.

D. Schedule Profile	<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
Mission Enhancement Little Bird (MELB) Miniaturization					x							
MELB Conformal Tanks						x						
MELB MS IIIB						x						
MELB Integration and Testing							x	x	x	x	x	x
Aircraft Survivability Equipment Testing and Installation						x	x	x	x	x	x	
Multimode Radar Weather Card MS II			x									
MH-47 Ballistic Protection System Contract Award						x						
NBC Crew Protection MH-60/MH-47									x			

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT D615							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev											
MH-47/60	VARIOUS	PM TAPO/Ft Eustis, VA	1.700	5.152	VARIOUS	3.107	VARIOUS	8.732	VARIOUS	Cont.	Cont.
A/MH-6	VARIOUS	PM-MELB/Ft Eustis, VA	0.843	3.140	VARIOUS	0.800	TBD	1.791	TBD	Cont.	Cont.
Subtotal Product Dev			2.543	8.292		3.907		10.523		Cont.	Cont.
Remarks:											
Subtotal Spt											
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT D615							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Devel Test & Eval MH-47/60	VARIOUS	PM TAPO/Ft Eustis, VA	0.115	0.500	VARIOUS	2.704	VARIOUS	0.600	VARIOUS	Cont.	Cont.
A/MH-6	VARIOUS	PM-MELB/Ft Eustis, VA	0.149	0.500	VARIOUS	0.608	VARIOUS	2.290	VARIOUS	Cont.	Cont.
Subtotal T&E			0.264	1.000		3.312		2.890		Cont.	Cont.
Remarks:											
Subtotal Management											
Remarks:											
Total Cost			2.807	9.292		7.219		13.413		Cont.	Cont.
Remarks:											

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S0417						

COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S0417, Underwater Systems Advanced Development	68.944	43.314	10.390	9.265	10.602	4.380	5.040	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project funds the development of Sea, Air, Land (SEAL) support items used during the conduct of hydrographic/inland reconnaissance, beach obstacle clearance, underwater ship attack, and other direct action missions. Sub-projects include:

- Advanced SEAL Delivery System (ASDS). The ASDS is a manned combatant mini-submarine used for the clandestine delivery of Special Operations Forces (SOF) personnel and weapons. The ASDS will provide the requisite range, endurance, payload, and other capabilities for operation in the full range of threat environments.
- Undersea Systems. Development of undersea systems which provide the SOF combat swimmers with the necessary diving and diving related equipment to fulfill assigned underwater combat missions include the following:
 - Naval Special Warfare Very Shallow Water Mine Countermeasures (NSW VSW MCM). Phased development/improvement of low magnetic and acoustic signature equipment to support the combat swimmer in the NSW VSW MCM operational environment.
 - Non-Gasoline Burning Outboard Engine. Development of a submersible outboard engine, which does not use highly volatile gasoline, for use on SOF Combat Rubber Raiding Craft.
 - Swimmer Transport Device. Test and procure a Commercial-Off-the-Shelf/Non-Developmental Item undersea mobility vehicle to transport combat swimmers when the distance from the ASDS to the target area or landing site is excessive.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S0417	
<ul style="list-style-type: none"> Sea, Air, Land (SEAL) Delivery Vehicle. Replace obsolescent electronics with maintainable systems. Improve reliability and mission success. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> (67.200) Advanced SEAL Delivery System (ASDS). Completed integration, construction, and initial certification of the first ASDS vehicle. Conducted operational test and evaluation of the first ASDS at shallow water test site. (1QTR99-4QTR99) (0.948) Naval Special Warfare Very Shallow Water Mine Countermeasures. Continued development of integrating sensor suite, propeller enhancements, hydrodynamic modifications and rechargeable extended-life battery packs for the Semi-Autonomous Hydrographic Reconnaissance Vehicle. (1QTR99-4QTR99) (0.796) Non-Gasoline Burning Outboard Engine. Completed basic engine design/development and began combined contractor/developmental/operational testing. Began development of Pre-Planned Product Improvement (P3I) proposal for noise reduction, continued integration of new Environmental Protection Agency mandated standards, and began preparation for MS III. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> (40.083) ASDS. Complete operational test and evaluation and final certification of the first ASDS vehicle. Initiate primary host fitup and sea trials of the first vehicle. Conduct hydrodynamic testing of host ship maneuvering characteristics and support of Virginia Class host submarine design efforts. Initiate development of P3I: secondary host, degaussing, external payload, and battery. (1QTR00-4QTR00) (1.976) Naval Special Warfare Very Shallow Water Mine Countermeasures (NSW VSW MCM). Semi-Autonomous Hydrographic Reconnaissance Vehicle (SAHRV) - Complete development, achieve a MS I/II decision, conduct developmental and operational testing, and achieve a MS III decision in preparation for award of production contract. Hydrographic Reconnaissance Littoral Mapping Device – 		

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S0417
<p>Achieve a MS I/II decision. Initiate modifications to a Commercial Off-The-Shelf Hydrographic Reconnaissance System. (1QTR00-4QTR00)</p> <ul style="list-style-type: none"> • (0.699) Non-Gasoline Burning Outboard Engine. Complete contractor/developmental testing, continue operational testing, complete proposal for Pre-Planned Product Improvement (P3I) noise reduction, complete integration of new Environmental Protection Agency standards, and achieve MS III. (1QTR00-4QTR00) • (0.556) Swimmer Transport Device. Initiate testing utilizing Commercial Off-the-Shelf (COTS)/Non-Developmental Item (NDI) units. (1QTR00-4QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (5.630) Advanced Sea, Air, Land (SEAL) Delivery System (ASDS). Continue hydrodynamic testing of host ship maneuvering characteristics and support of Virginia Class host submarine design efforts. Continue development of P3I: secondary host, degaussing, external payload, battery, and sensors. (1QTR01-4QTR01) • (3.963) Naval Special Warfare Very Shallow Water Mine Countermeasures (NSW VSW MCM). P3I for the sensor/navigation system onboard the Semi-Autonomous Hydrographic Reconnaissance Vehicle. Complete modifications to the Hydrographic Reconnaissance Littoral Mapping Device, conduct developmental and operational testing, and achieve a MS III decision in preparation for award of a production contract. (1QTR01-4QTR01) • (0.268) STD. Continue testing of COTS/NDI units. (1QTR01-2QTR01) • (0.529) SEAL Delivery Vehicle. Develop, test and procure improved electronics components. (1QTR01-4QTR01) 	

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE	FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S0417		

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	<u>To Complete</u>	<u>Total Cost</u>
Advanced Sea, Air, Land (SEAL) Delivery Sys (ASDS)									
PROC, ASDS	9.247	7.379	25.500	74.672	10.927	78.859	7.012	Cont.	Cont.
PROC, ASDS Adv Proc	0.001	7.977	22.472		31.303			Cont.	Cont.
Naval Special Warfare Very Shallow Water Mine Countermeasures									
PROC, Maritime Equip.		1.583	4.252						5.835
Non-Gasoline Burning Outboard Engine									
PROC, Maritime Equip.		2.671							2.671
Swimmer Transport Device									
PROC, Maritime Equip.			0.926	1.180					2.106
PROC, MK8 MOD 1 SEAL Delivery Vehicle	0.580			1.047	1.676	1.717	1.758	Cont.	Cont.

C. Acquisition Strategy:

- ASDS. Selected three qualified companies to develop independent preliminary designs. Following completion of the preliminary design efforts, a request for proposal for the engineering and manufacturing development contract was released to these companies for proposal submittal for the design, fabrication, and test of the first ASDS. A single contractor was selected based on a best value source selection process.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000											
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S0417											
					<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4
Advanced Sea, Air, Land (SEAL) Delivery System																
Shallow Water Testing								x								
Deep Water Testing									x							
Delivery of First Unit										x						
Hydrodynamic Testing												x	x	x	x	
Pre-Planned Product Improvement (P3I) Development												x	x	x	x	x
Non-Gasoline Burning Outboard Engine																
Milestone III											x					
Naval Special Warfare Very Shallow Water Mine Countermeasures																
Milestone I/II (Semi-Autonomous Hydrographic Reconnaissance Vehicle (SAHRV))									x							
Milestone III (SAHRV)											x					
Milestone I/II (Hydrographic Reconnaissance Littoral Mapping Device (HRLMD))												x				
Milestone III (HRLMD)															x	
Swimmer Transport Device																
Test Commercial-off-the-Shelf/Non-Developmental Items											x	x	x	x		
SEAL Delivery Vehicle																
Develop and Test Improved Electronics													x	x	x	x

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S0417							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev											
NBOE	CPF	OMC, Waukegan, IL	0.249	0.258	VARIOUS	0.357	VARIOUS			Cont.	Cont.
NSW VSW MCM	VARIOUS	VARIOUS	1.948	0.450	MAY 99	0.876	JAN 00	2.878	DEC 00	Cont.	Cont.
SDV	WR	See Note 1	11.719					0.476	VARIOUS	Cont.	Cont.
STD	TBD	TBD						0.108	VARIOUS		0.108
ASDS	CPIF/C	Northrop-Grumman	154.000	58.982	VARIOUS	36.687	VARIOUS	5.165	VARIOUS	Cont.	Cont.
ASDS	CPFF	Newport News Ship Yard, VA	9.000	3.400	VARIOUS	0.500	VARIOUS				12.900
ASDS	VARIOUS	VARIOUS	3.500	0.268	FEB 99						3.768
Subtotal Product Dev			180.416	63.358		38.420		8.627		Cont.	Cont.
Remarks:											
Note 1: Coastal System Station, Panama City, FL.											
Technical Data											
NBOE	WR	CSS, Panama City, FL		0.043	NOV 98						0.043
NSW VSW MCM	WR	CSS, Panama City, FL				0.100	JAN 00	0.100	NOV 00		0.200
NSW VSW MCM	WR	NSWC, Panama City, FL				0.455	JAN 00	0.500	NOV 00		0.955
ASDS	VARIOUS	VARIOUS	4.900	1.600	JAN 99	1.096	VARIOUS			Cont.	Cont.
Subtotal Spt			4.900	1.643		1.651		0.600		Cont.	Cont.
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S0417							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Engineering T&E (NBOE)	WR	CSS, Panama City, FL	0.120	0.148	JAN 99	0.151	JAN 00				0.419
Devel T&E (NSW VSW MCM)	WR	VARIOUS	0.015	0.143	JUL 99						0.158
Oper. T&E (NSW VSW MCM)	WR	OPTEVFOR, Norfolk, VA				0.100	JUN 00				0.100
OT&E (STD)	MIPR	OPTEVFOR, Norfolk, VA				0.373	MAY 00	0.060	VARIOUS		0.433
Subtotal T&E			0.135	0.291		0.624		0.060		0.000	1.110
Remarks:											
Contrac. Eng Spt (NBOE)	DO	ADS, Panama City, FL	0.075	0.090	FEB 99	0.068	JAN 00				0.233
Program Mgt Spt (NBOE)	VARIOUS	CSS, Panama City, FL	0.524	0.257	NOV 98	0.123	JAN 00				0.904
Contrac. Eng Spt (NSW VSW MCM)	VARIOUS	VARIOUS	0.233	0.165	MAR 99	0.178	JAN 00	0.197	DEC 00	Cont.	Cont.
Govt. Eng Spt (NSW VSW MCM)	WR	NSWC, Panama City, FL		0.150	NOV 98	0.200	JAN 00	0.200	NOV 00	Cont.	Cont.
Program Mgt Spt (NSW VSW MCM)	WR	NAVSEA, Arlington, VA	0.050	0.040	JAN 99	0.032	DEC 99	0.053	DEC 00	Cont.	Cont.
Travel (NSW VSW MCM)	WR	NAVSEA, Arlington, VA	0.025			0.035	VARIOUS	0.035	DEC 00	Cont.	Cont.
Program Mgt Spt (SDV)	WR	NAVSEA, Arlington, VA	0.374					0.053	DEC 00	Cont.	Cont.
VARIOUS (ASDS)	VARIOUS	VARIOUS		2.950	VARIOUS	1.800	VARIOUS	0.465	VARIOUS	Cont.	Cont.
Program Mgt Spt (STD)	VARIOUS	VARIOUS				0.183	VARIOUS	0.100	TBD		
Subtotal Management			1.281	3.652		2.619		1.103		Cont.	Cont.
Remarks:											
Total Cost			186.732	68.944		43.314		10.390		Cont.	Cont.
Remarks:											

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)				DATE						
				FEBRUARY 2000						
APPROPRIATION / BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE / PROJECT NO.								
RDT&E, DEFENSE-WIDE / 7		PE 1160404BB Spec Operations Tactical Systems Development / Project S1684								
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S1684, SOF Surface Craft Advanced Development		.196	4.718	1.826	3.466	1.066	.580	1.486	Cont.	Cont.
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project provides for the development and testing of surface combatant craft and selected items of specialized equipment to meet the unique requirements of Special Operations Forces (SOF). These craft and equipment will permit small, highly trained forces to conduct required operations across the entire spectrum of conflict.</p> <ul style="list-style-type: none"> Special Operations Craft – Riverine (SOC-R). This armored craft will provide SOF with the capability to insert and extract SOF in the riverine environment. The SOC-R will be capable of navigating coastal, restricted and shallow rivers, estuaries, bays and littoral, and carry light organic arms. In addition, the craft will be capable of being transported and air-dropped by C-130 aircraft. The SOC-R replaces the Vietnam-Era MK II Patrol Boat Riverine and the Mini Armored Troop Carrier. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> (0.196) Completed Naval Special Warfare Rigid Inflatable Boat airdrop. (3QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> (4.654) SOC-R. Approve acquisition strategy, develop and issue request for proposal, conduct source selection, and award prototype development contract. (1QTR00-4QTR00) 										

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE				
					FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Spec Operations Tactical Systems Development / Project S1684						
FY 2001 PLAN:									
<ul style="list-style-type: none"> (1.826) Special Operations Craft–Riverine (SOC-R). Convert commercial prototype into combatant craft, adding weapons, armor, tactical communication and military electronics. Perform combined developmental/operational testing. Perform operational evaluation. (1QTR01-4QTR01) 									
B. <u>Other Program Funding Summary</u>									
	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
NSWRIB PROC, NSWRIB	14.869								
SOC-R PROC, SOF Combatant Craft Sys		6.597	5.663	2.029	4.918	6.664	7.784	Cont.	Cont.
C. <u>Acquisition Strategy:</u>									
<ul style="list-style-type: none"> Market Survey Completed. Business Case Analysis conducted on best value. Based on analysis results, acquisition strategy is under development. 									

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000											
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Spec Operations Tactical Systems Development / Project S1684											
					<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
					1	2	3	4	1	2	3	4	1	2	3	4
<u>D. Schedule Profile</u>																
SOC-R																
MS O/I										x						
MS II															x	
Conduct DT/OT															x	

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SOF SURFACE CRAFT ADVANCE DEVELOPMENT / PROJECT S1684							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
SOC-R											
Build + Test Prototype	CPFF	TBD				2.470	JAN 00				2.470
Logistics Development	CPFF	Unknown				0.775	SEP 00			Cont.	Cont.
DT/OT Support	VARIOUS	VARIOUS				0.769	MAR 00	1.170	JAN 01	Cont.	Cont.
PMO Support	VARIOUS	VARIOUS				0.160	FEB 00	0.656	OCT 00	Cont.	Cont.
Subtotal Product Dev						4.174		1.826		Cont.	Cont.
Remarks:											
SOC-R P3I											
Airdrop Subsystem		TBD								Cont.	Cont.
Ballistic Protection	CPFF	VARIOUS				0.250	JUN 00			Cont.	Cont.
Smoke/Obscurant	CPFF	VARIOUS				0.230	MAY 00			Cont.	Cont.
NSW RIB Airdrop				0.196	VAR						
Subtotal Spt						0.480		0.000		Cont.	Cont.
Remarks:											
Total Cost											
				0.196		4.654		1.826		Cont.	Cont.
Remarks:											

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)						DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S350							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S350, Special Operations Forces Planning and Rehearsal System		4.024	3.147	3.352	3.103	2.853	2.665	3.615	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project is a joint evolutionary acquisition program for the USSOCOM. Special Operations Forces Planning and Rehearsal System (SOFPARS) is developing an automated mission planning capability to support Special Operations Forces (SOF). SOFPARS will consist of a collection of automated mission planning hardware and software tools. Those tools include SOF enhancements to the Air Force Mission Support personal computer-based Portable Flight Planning Software. SOFPARS will be provided to Air Force Special Operations Command, United States Army Special Operations Command, and Naval Special Warfare Command units. SOFPARS will automate mission planning, thus allowing SOF commanders and operators to plan and respond quickly to missions of national importance, as well as day-to-day taskings. To accomplish this task, SOFPARS will provide a multi-command-level planning capability at major SOF headquarters, theater headquarters, SOF forward operating bases and forward operating locations. SOFPARS will also provide portable subsystems and mission execution support products for use by crews deployed to operational locations. Present mission planning capabilities cannot adequately support the stated mission need. Existing systems are insufficient for planning SOF operations. Specifically, existing systems lack sufficient processing speed and flexibility, storage capacity, growth potential, graphics (both on-screen and hard copy output), image processing and storage, and the ability to process combat planning folder data in a timely manner. They also lack near-real-time access to national/tactical level data bases and the capability to update data in a timely fashion, and lack the means to effectively process the data during mission planning. The mobility, complexity, quantity, and lethality of enemy threats dictate automated data input and systems that can be interfaced via electronic communication systems throughout the SOF community. The SOFPARS effort meets the joint requirement to ensure interoperability and standardization of the mission planning process between SOF and the Services. Aircraft affected include MH-60G/K/L, MH-47E/D, MH-53J, MC-130E/H, AC-130H/U, AH/MH-6, MC-130P, EC-130E, and CV-22. SOFPARS will also provide timely loading/mission critical data/mission planning capability to the SOF ground and maritime platforms and/or forces.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S350	
<p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none">• (0.907) Continued SOF unique features development. (1QTR99-4QTR99)• (1.636) Continued personal computer (PC)-based development and integration with Portable Flight Planning Software architecture. (1QTR99-4QTR99)• (1.481) Continued aircraft weapons/electronics interface software module development. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none">• (0.623) Begin new software architecture development interfaces to component Army, Air Force and Navy mission planning, rehearsal and execution systems. (1QTR00-4QTR00)• (1.098) Continue meeting deferred/future requirements and aircraft weapons/electronics interface support for PC development and interface with joint systems. (1QTR00-4QTR00)• (1.426) Program office and engineering support/services. (1QTR00-4QTR00)		

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S350	

FY 2001 PLAN:

- (0.598) Continue to develop software architecture interfaces to service/component mission planning, rehearsal, and execution systems. (1QTR01-4QTR01)
- (1.859) Continue meeting deferred/future requirements and aircraft weapons/electronics interface support for personal computer (PC) development and interface with joint systems. (1QTR01-4QTR01)
- (0.895) Program office and engineering support/services. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, Special Operations Forces Planning and Rehearsal System	.610	2.414	2.021	1.438	0.923	0.941	.565	Cont.	Cont.

C. Acquisition Strategy:

Develop mission planning software to support SOF operations leveraging ongoing PC-based efforts under the Air Force Mission Support System program. Integration of PC-based Portable Flight Planning Software to support SOF requirements maximizes use of commercial off-the-shelf software technology and components to reduce overall costs and schedule. Contract strategy combines various contracts and types to include competitively awarded cost plus and sole source cost no fee (educational institution) contracts. Maximize use of existing hardware technology procured via firm fixed price contract to take advantage of software portability and open system architecture. Focuses on platform specific software

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE																																																																																																																																																			
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<p>interface modules required to initialize and upload platform mission computers avionics through the use of electronic data transfer devices. Uses software support facility to maintain and update software.</p>																																																																																																																																																								
<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th colspan="4" style="text-align: center;"><u>FY99</u></th> <th colspan="4" style="text-align: center;"><u>FY00</u></th> <th colspan="3" style="text-align: center;"><u>FY01</u></th> </tr> <tr> <th style="width: 50%;"></th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> </tr> </thead> <tbody> <tr> <td>D. <u>Schedule Profile</u></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Air Force Mission Support System 2.2 Development Contract Award – Interface Modules</td> <td style="text-align: center;">x</td><td></td><td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td> </tr> <tr> <td>Portable Flight Planning System Releases</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td> 3.1</td> <td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td> 3.11</td> <td></td><td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td> 3.2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td> </tr> <tr> <td>Software Integration & Testing</td> <td></td><td style="text-align: center;">x</td><td style="text-align: center;">x</td><td style="text-align: center;">x</td><td></td><td style="text-align: center;">x</td><td style="text-align: center;">x</td><td style="text-align: center;">x</td><td></td><td style="text-align: center;">x</td><td style="text-align: center;">x</td><td style="text-align: center;">x</td> </tr> <tr> <td>Threat Import Tool Contract Award</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td> Release</td> <td></td><td></td><td></td><td style="text-align: center;">x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>												<u>FY99</u>				<u>FY00</u>				<u>FY01</u>				1	2	3	4	1	2	3	4	1	2	3	4	D. <u>Schedule Profile</u>													Air Force Mission Support System 2.2 Development Contract Award – Interface Modules	x					x				x			Portable Flight Planning System Releases													3.1				x									3.11					x								3.2										x			Software Integration & Testing		x	x	x		x	x	x		x	x	x	Threat Import Tool Contract Award													Release				x								
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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S350							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Licenses	ALLOT	ESC, Hanscom AFB, MA	26.111								26.111
Subtotal Product Dev			26.111								26.111
Remarks:											
Development Support	C/CPFF	Tybrin, Ft Walton Beach, FL	3.400	1.498	VARIOUS	1.631	VARIOUS	1.726	VARIOUS	Cont.	Cont.
Software Support	C/CPFF	LMFS, Owego, NY	5.047							Cont.	Cont.
Training Development	C/CPFF	LMFS, Owego, NY	0.750							Cont.	Cont.
Configuration Management	C/CPFF	LMFS, Owego, NY	1.200							Cont.	Cont.
Technical Data	C/CPFF	Tybrin, Ft Walton Beach, FL		0.338	VARIOUS	0.235	VARIOUS	0.199	VARIOUS	Cont.	Cont.
Subtotal Spt			10.397	1.836		1.866		1.925		Cont.	Cont.
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S350							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Developmental Test & Eval	MIPR	46th FTS, Hurlbert Field, FL	0.200	0.150	VARIOUS	0.289	VARIOUS	0.314	VARIOUS	Cont.	Cont.
Operational Test & Eval	MIPR	18th FTS, Hurlbert Field, FL	0.303	0.194	JAN 99	0.198	NOV 99	0.218	VARIOUS	Cont.	Cont.
GFE	MIPR	Integrated Aviation Systems 21 Working Group Ft Campbell, KY		0.188	VARIOUS						
Subtotal T&E			0.503	0.532		0.487		0.532		Cont.	Cont.
Remarks:											
Contractor Engineering Spt	PO	CAS Inc, Huntsville, AL	3.414	0.421							
Government Engineering Spt	ALLOT	AATD, Ft Eustis, VA	6.000	1.028	OCT 98	0.546	OCT 99	0.607	OCT 00	Cont.	Cont.
Travel	ALLOT	SOF PMO Ft Eustis, VA		0.080	OCT 98	0.080	OCT 99	0.088	OCT 00	Cont.	Cont.
Overhead	ALLOT	SOF PMO Ft Eustis, VA		0.127	OCT 98	0.168	OCT 99	0.200	OCT 00	Cont.	Cont.
Subtotal Management			9.414	1.656		0.794		0.895		Cont.	Cont.
Remarks:											
Total Cost			46.425	4.024		3.147		3.352		Cont.	Cont.
Remarks:											

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S625							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S625, SOF Training Systems		22.798	9.190	8.731	19.110	1.892	1.878	0	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project funds analysis, development, test, and integration of Special Operations Forces (SOF) aviation-related training and mission rehearsal systems and upgrades. Sub-projects include:

- AC-130U Gunship Aircrew Training Devices/Testbed (ATD/TB) [formerly AC-130U Gunship Aircrew/Maintenance Training System (GA/MTS)]: The ATD/TB develops an integrated, ground-based combination training and mission rehearsal system to support initial, mission, special qualification, continuation, upgrade and maintenance training for the AC-130U Gunship aircrews. ATD/TB will be networked with other SOF simulators.
- AC-130H Crew Station Trainer: Currently all procedural training is conducted on powered-up static aircraft, or in the air. This program develops a procedural trainer for the battle management center.
- Light Assault Attack Reconfigurable Simulator (LASAR): Develops an integrated, combat mission flight simulator into the existing High Level Architecture (HLA) environment to conduct real-world mission rehearsal. LASAR simulator will integrate initial, mission, special qualification, continuation, and upgrade flight training, including weapons training. Currently, no training devices exist with this capability.
- HLA: DOD-wide effort sponsored by Defense Simulator Modeling and Simulation Office to support a broad spectrum of distributed simulation applications, building on the experience of distributed interactive simulation protocols.

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S625
<p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (17.346) Aircrew Training Device/Testbed (ATD/TB). Continued development of flight deck and remaining crew stations. (1QTR99-4QTR99) • (2.134) ATD/TB. Completed sensor upgrade. (1QTR99-3QTR99) • (1.916) ATD/TB. Completed simulation and interface development. (1QTR99-4QTR99) • (1.402) Continued program management office support. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (5.130) ATD/TB. Achieve full operational capability for navigator/fire control officer and sensor operator. Continue flight deck development. (1QTR00-4QTR00) • (2.587) AC-130H Crew Station Trainer. Develop a procedural trainer for AC-130H aircraft. (2QTR00) • (0.573) Light Assault Attack Reconfigurable Simulator. Release final request for proposal and conduct source selection. (3QTR00) • (0.900) Provide program management office support. (1QTR00-4QTR00) 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE	FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S625		

FY 2001 PLAN:

- (1.473) Aircrew Training Device/Testbed (ATD/TB). Complete development of flight deck and integration with the Battle Management Center (BMC). (1QTR01-4QTR01)
- (4.373) Light Assault Attack Reconfigurable Simulator (LASAR). Award Engineering, Manufacturing and Development (EMD) contract. Begin development/front-end analysis of aircrew training manual, field of view, control loading, and weapons. (1QTR01-4QTR01)
- (2.056) High Level Architecture (HLA). Update compliant HLA system conforming to HLA rules, the HLA interface specification, and the HLA object model template for the MC-130E, MC-130H, MH-47E, and MH-60K training devices. (1QTR01-4QTR01)
- (0.829) Program management office support. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, SOF Training Systems	12.383	2.101	2.364	.112	.096	2.444	27.489	Cont.	Cont.

C. Acquisition Strategy:

- ATD/TB program is currently in Phase II. The two-phase acquisition strategy first built a BMC testbed using production AC-130U avionics, commercial image generation, and computers to refine user requirements prior to the second phase to procure a complete BMC and flight deck aircrew training device. A Milestone II decision occurred 4QFY97. Phase II feasibility analysis has been completed. Hardware vendor selection process is complete and proof of principle activities began 2QFY99.

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S625												
<ul style="list-style-type: none"> • Light Assault Attack Reconfigurable Simulator. Award Engineering, Manufacturing and Development contracts by full and open competition. Maximize use of non-developmental item technology and actual Airworthy Aircraft Components for design, development and test. • High Level Architecture (HLA). Develop compliant HLA system conforming to HLA rules, the HLA interface specification, and the HLA object model template for the MC-130E, MC-130H, MH-47E, and MH-60K training devices. 																	
					<u>FY99</u>			<u>FY00</u>			<u>FY01</u>						
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4	
Aircrew Training Device/Testbed Development/Integration					x	x	x	x	x	x	x	x	x	x	x	x	
Begin Flight Deck Proof of Principle								x									
HLA Update														x			
AC-130H Crew Station Trainer Contract Award										x							
Light Assault Attack Reconfigurable Simulator (LASAR) Request for Proposal											x						
LASAR Engineering, Manufacturing, and Development Contract Award														x			
LASAR Development															x	x	x

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S625							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
System Eng Design/Dev	TBD	TBD						4.373	NOV 00	Cont.	Cont.
Light Assault Attack Reconfigurable Simulator											
Gunship Aircrew/Maintenance Training System	C/CPAF	LMIS - Orlando, FL	20.618	21.396	VARIOUS	5.130	VARIOUS	0.973	NOV 00		48.117
AC-130H Crew Station Trainer	C/CPAF	LMIS - Orlando, FL				2.587	MAR 00				2.587
Subtotal Product Dev			20.618	21.396		7.717		5.346		Cont.	Cont.
Dev Spt											
HLA	C/CPAF	LMIS - Orlando, FL						1.055	NOV 00	Cont.	Cont.
Subtotal Spt								1.055	NOV 00	Cont.	Cont.
Devel Test & Eval											
ATD/TB	C/FFP	LMIS - Orlando, FL						0.500	NOV 00	Cont.	Cont.
HLA								1.001	NOV 00	Cont.	Cont.
Subtotal T&E								1.501		Cont.	Cont.
Prog Mgt Spt	ALLOT	STRICOM, Orlando, FL	2.452	1.402	VARIOUS	1.473	VARIOUS	0.829	VARIOUS	Cont.	Cont.
Subtotal Management			2.452	1.402		1.473		0.829		Cont.	Cont.
Remarks:											
Total Cost			23.070	22.798		9.190		8.731		Cont.	Cont.
Remarks:											

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)				DATE FEBRUARY 2000						
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7		R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S700								
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S700, Communications Advanced Development		2.118	2.662	3.571	3.849	2.742	3.027	3.040	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides for development and testing of selected items of specialized equipment to meet the unique requirements of Special Operations Forces (SOF). Specialized equipment will permit small, highly trained forces to conduct required operations across the entire spectrum of conflict. These operations are generally conducted in harsh environments, for unspecified periods, and in locations requiring small unit autonomy. SOF must infiltrate by land, sea, and air to conduct unconventional warfare, direct actions, or deep reconnaissance operations in denied areas against insurgent units, terrorists, or highly sophisticated threat forces. The requirement to operate in denied areas controlled by a sophisticated threat mandates that SOF systems remain technologically superior to threat forces to ensure mission success.

USSOCOM has developed an overall strategy to ensure that Command, Control, Communications, Computers, and Intelligence (C4I) systems continue to provide SOF with the required capabilities into the 21st century. USSOCOM's C4I systems comprise an integrated network of systems providing positive command and control and timely exchange of intelligence and threat warning to all organizational echelons. The C4I systems that support this new architecture will employ the latest standards and technology by transitioning from separate systems to full integration with the infosphere. The infosphere is a multitude of existing and projected national assets that operate with any force combination in multiple environments. The C4I programs funded in this project are grouped by the level of organizational element they support: Operational Element (Team), Above Operational Element (Deployed), and Above Operational Element (Garrison). Sub-projects include:

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S700	
<p>OPERATIONAL ELEMENT (TEAM)</p> <ul style="list-style-type: none"> • Active Noise Reduction (ANR): ANR is an electronic noise canceling device, which will be built into air crew helmets, and headsets. This system detects noise, reverses phase, duplicates amplitude, and feeds the signal into the headset, thereby canceling most of the noise. These high noise levels cause irritability, fatigue, and dizziness, which can compromise the aircrew ability to perform mission tasks. • Multi-Band Inter/Intra Team Radio (MBITR). MBITR will provide lightweight, handheld, inter/intra team communications for Joint SOF. SOF teams conduct air, ground, and maritime missions across the entire operational spectrum. These missions currently require SOF teams to carry multiple handheld radios operating in several different frequency bands to ensure positive communications. The MBITR will provide each of these frequency bands in a single handheld radio with embedded communications security (COMSEC). • Special Operations Communications Assemblage (SOCA) Improvement. Program upgrades 80 SOCA units delivered to SOF units in FY 1993 and prior. Proposed modifications include repackaging/downsizing (no more than 70lbs. less generator), enhanced graphics, ultra high frequency satellite communications demand assigned multiple access capability, advanced data controllers, and document upgrades to enhance interoperability with conventional and other SOF units. The acquisition strategy is to develop and test the proposed improvements of first article test items. • Special Mission Radio System (SMRS). SMRS is a joint radio system that provides SOF a lightweight, low probability of intercept/low probability of detection high frequency (HF) radio with co-resident military standard automatic link establishment (ALE), non-standard ALE, and internal communication security capabilities. Deployed in hostile and clandestine environments, the system consists of manpack radio and base station, and provides hardware improvements and software documentation. This program also acquires general-purpose HF radio systems for SOF mission requirements. 		

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<ul style="list-style-type: none"> • Condor. Condor is a secure worldwide cellular telephone service with the inter/intra team capability. The system consists of handset equipment, mobile base station, low earth orbit satellites constellation with gateways, airborne base stations/relays, and manpack cell sites/gateways which supports 2000 users. These systems will support SOF in all aspects of their missions. • Mission Planning, Analysis, Rehearsal and Execution (MPARE) System. A joint, fully integrated Command and Control (C2) system of systems that is focused on a common operational capability for SOF commander's at all levels. MPARE will allow for collaborative and distributed information sharing/analysis, from all echelons in and out of the SOF community, through all phases of the SOF mission for both the deliberate and time-critical environment. MPARE will integrate disparate current SOF mission planning and execution systems, simulations, and simulators and ensure complete integration with relevant command, control, communications and intelligence (C4I), surveillance and reconnaissance networks. Currently, this capability does not exist and is critical for SOF commanders to maintain their information dominance well into the 21st Century. <p>ABOVE OPERATIONAL ELEMENT (DEPLOYED)</p> <ul style="list-style-type: none"> • Special Mission Radio System (SMRS). SMRS is also planned for use at this level. • Joint Base Station (JBS). JBS is an evolutionary acquisition program, which encompasses five Service-specific requirements: TSC-135 (core capability, commercial vehicle system), TSC-135 (V)1 (military vehicle system with transit case capabilities), TSC-135 (V)2 (transit case system) and TSC-135 (V)3 (fixed site system). JBS will provide SOF with continuous, reliable, communications among SOF component commands while allowing for differences in missions. JBS will contain line-of-sight (LOS) and beyond-LOS radios, and associated message handling, providing command and control voice, imagery, data, and facsimile. • SOF Tactical Assured Connectivity Systems (SOFTACS). SOFTACS is an integrated suite of communications systems designed to support the high-capacity, digital, secure, interoperable, transmission and switching requirements of the USSOCOM C4I architecture. 	

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<p>ABOVE OPERATIONAL ELEMENT (GARRISON)</p> <ul style="list-style-type: none"> Special Mission Radio System (SMRS) is also planned for use at this level. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> (0.708) Multi-Band Inter/Intra Team Radio. Conducted development and operational testing in support of Milestone (MS) III. (2QTR99-4QTR99) (0.030) Active Noise Reduction. Acquired battery packs for testing. (4QTR99) (0.201) Special Operations Communications Assemblage Improvement. Conducted market research and performed integration and test of non-developmental item upgrades. (3QTR99-4QTR99) (0.291) SMRS. Completed operational test and evaluation in support of MS III. (1QTR99-4QTR99) (0.487) Joint Base Station. Performed test and evaluation of new technologies in support of Evolutionary Technology Insertion's (ETI's) for all variants. (2QTR99-4QTR99) (0.290) SOF Tactical Assured Connectivity Systems. Continued developmental/operational test and evaluation support. Conducted market research for block 2 ETI's. (2QTR99-4QTR99) (0.111) Condor. Conducted engineering analysis. (4QTR99) 		

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S700
<p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (0.182) Special Operations Communications Assemblage Improvement (SOCAIMP). Complete integration and testing of non-development item upgrades. (1QTR00-2QTR00) • (0.848) Special Mission Radio System (SMRS). Perform test and evaluation of digital message entry device Evolutionary Technology Insertion's (ETIs). (1QTR00-4QTR00) • (0.358) Joint BaseStation (JBS). Continue test and evaluation of new technologies in support of ETI's for all variants. (1QTR00-4QTR00) • (1.085) SOF Tactical Assured Connectivity (SOFTACS). Continue developmental /operational test and evaluation to support Milestone (MS) III. Start testbed operations for block 2 ETI's. Conduct market research for block 3 ETI's. (1QTR00-4QTR00) • (0.148) Multi-Band Inter/Intra Team Radio. Complete additional testing. (1QTR00-2QTR00) • (0.041) Naval Special Warfare (NSW) Tactical Radio Systems (TRS). Perform TRS integration support. (2QTR00-4QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (0.940) SMRS. Initiate test and evaluation of a new SMRS vehicle kit. (2QTR01-4QTR01) • (0.416) JBS. Continue test and evaluation of new technologies in support of ETI's for all variants. (1QTR01-4QTR01) 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE	FEBRUARY 2000
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- (0.873) SOFTACS. Conduct test-bed operations for block 3 ETI's. Conduct market research for block 4 ETI's. (1QTR01-3QTR01)
- (1.342) Mission Planning, Analysis, Rehearsal and Execution (MPARE). Provides interoperability and integration for rehearsal, training, simulators and other external systems for command and control capability. Also provides for Theater Special Operations Commands (TSOC) interface with theater components and theater CINCs, and between TSOCs. Conduct market research and test and evaluation in support of procuring a top scene like capability. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, Communications & Electronics	70.401	84.028	74.444	56.092	25.541	32.358	33.842	Cont.	Cont.

C. Acquisition Strategy:

- SOF Tactical Assured Connectivity Systems (SOFTACS). The SOFTACS program will be managed under an evolutionary acquisition strategy. Evolutionary Technology Insertion's (ETI's) are integrated through block upgrades. ETI's will be supported by market research and test and evaluation, which will be used to evaluate the benefits and impacts on the SOFTACS.
- The MPARE program will be managed under an evolutionary acquisition strategy. The MPARE program will conduct market research, test and evaluation of ETIs.

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S700		

- Special Mission Radio System (SMRS) is currently in production and is now being managed under an evolutionary acquisition strategy. The SMRS program will conduct market research, test and evaluation of new technologies to determine ETIs for SMRS components.
- Joint Base Station (JBS) is currently in production and is now being managed under an evolutionary acquisition strategy. The JBS program will conduct market research, test and evaluation of new technologies and commercial off-the-shelf/non-developmental items to determine ETI's for all JBS program variants.

D. <u>Schedule Profile</u>	<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
Active Noise Reduction												
Battery Packs				x								
Multi-Band Inter-Team Radio												
Developmental Test/Operational Test		x	x	x	x	x						
Milestone (MS) III				x								
Special Operations Communications Assemblage Improvement												
Market Research			x	x								
Testing and Integration			x	x	x	x						
Special Mission Radio System												
Operational Test	x	x	x									

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S700											
					<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4
MS III								x								
ETI Testing and Integration									x	x	x	x		x	x	x
Joint Base Station																
ETI Testing and Integration All Variants						x	x	x	x	x	x	x	x	x	x	x
SOF Tactical Assured Connectivity System																
Developmental Test/Operational Test						x	x	x	x	x	x					
Milestone (MS) III													x			
Evolutionary Technology Insertion (ETI) Market Research								x	x	x			x	x	x	
ETI testing and integration									x	x	x	x	x	x	x	
Mission Planning, Analysis, Rehearsal and Execution System																
Market Research													x	x		
Testing and Evaluation														x	x	x
Condor Engineering Analysis								x								
Naval Special Warfare (NSW) Tactical Radio Systems.																
Testing and Integration										x	x	x				

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S700							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev	Allot	NSMA; Arlington, VA	1.924			0.393	JAN00				2.317
	MIPR	NAWC AD; St. Inigoes, MD		0.487	MAR 99	0.296	JAN 00	0.958	NOV 00	8.474	10.215
	MIPR	SPAWAR; Charleston, SC		0.108	MAY 99	0.728	JAN00	1.421	NOV 00	0.483	2.740
	Cost Share	Racal; Rockville, MD	0.646	0.654	MAR 99						1.300
Ancillary Hardware Dev											
Systems Engineering	MIPR	NAWC AD; St. Inigoes, MD	2.147	0.125	MAY99						2.272
	MIPR	SPAWAR; Charlseton, SC		0.111	SEP99			0.136	NOV00		0.247
Licenses	Allot	DISA; Reston, VA	0.500								0.500
Tooling	Allot	DSA PM SATCOM/CECOM; Ft. Monmouth, NJ	1.172								1.172
GFE	CPFF	SSDS; Englewood, CO	5.472								5.472
Award Fees	Allot	NAWC AD; St. Inigoes, MD	7.531								7.531
Subtotal Product Dev			19.392	1.485		1.417		2.515		8.957	33.766
Remarks:											
Dev Spt											
Software Spt	MIPR	NAWC AD; St. Inigoes, MD				0.103	OCT99				0.103
	MIPR	NSMA; Arlington, VA				0.223	JAN00				0.223
Training Dev											
Integrated Logistics Spt											
Configuration Management											
Technical Data											
GFE											
Subtotal Spt						0.326					0.326
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS Dev / PROJECT S700							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Deval Test & Eval	VARIOUS	VARIOUS	0.370	0.076	VARIOUS	0.078	VARIOUS	0.054	VARIOUS		0.578
Operational Test & Eval	VARIOUS	VARIOUS	0.092	0.375	VARIOUS	0.484	VARIOUS	0.247	VARIOUS	1.072	2.270
Tooling											
GFE											
Subtotal T&E			0.462	0.451		0.562		0.301		1.072	2.848
Remarks:											
Contractor Engineering Spt	VARIOUS	VARIOUS	1.231	0.182	VARIOUS			0.415	VARIOUS	1.477	3.305
Government Engineering Spt	VARIOUS	VARIOUS	6.370			0.240	VARIOUS	0.166	VARIOUS	0.617	7.393
Program Management Spt	VARIOUS	VARIOUS				0.117	VARIOUS	0.122	VARIOUS	0.447	0.686
Travel	N/A	VARIOUS						0.052	VARIOUS	0.192	0.244
Labor (Research Personnel)											
Overhead											
Subtotal Management			7.601	0.182		0.357		0.755		2.733	11.628
Remarks:											
Total Cost			27.455	2.118		2.662		3.571		12.762	48.568
Remarks:											

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S800						

COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S800, Special Operations Munitions Advanced Development	4.348	4.712	11.849	.810	.824	1.283	4.543	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides for the acquisition of selected, specialized munitions and equipment to meet unique Special Operations Forces (SOF) requirements. This is a continuing program. Sub-projects include:

- Improved Limpet Mine (ILM). The ILM will replace the existing limpet assembly modular. The ILM is required for sea, air, land delivery vehicle attacks against ships, submarines, nested patrol craft, submerged harbor facilities, and various other maritime targets. The ILM will provide greater explosive weight to be delivered to the target, decrease time-on-target by improving handling procedures, and result in an enhanced probability of mission success.
- SOF Demolition Kit. The kit consists of inert hardware sets for explosively formed penetrators, conical shaped charges and linear shaped charges, along with tools, equipment, and attachment devices for constructing and emplacing a variety of demolition charges. The kit allows the SOF operator to tailor the demolition charges to the target providing greater lethality and mission flexibility.
- Remote Activated Munitions System. Provides a capability to remotely control detonation of demolition charges or the remote operation of other items of equipment such as beacons, laser markers, radios, and weapons.

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S800
<ul style="list-style-type: none"> • Time Delay Firing Device. Provides the SOF operator command and control of hand-emplaced munitions (i.e., influence when and how munitions will be initiated). Capability provided includes time delay and sympathetic initiation of munitions without the use of primary explosives during tactical operations. The elimination of primary explosives is a quantum leap in the safety and reliability of initiation devices. <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (2.326) Improved Limpet Mine (ILM). Continued design and test of ILM subsystems. (1QTR99-4QTR99) • (0.874) SOF Demolition Kit (SOFDK). Initiated design, fabrication and testing of a preplanned product improvement warhead. Completed engineering and manufacturing development (EMD) for large warhead. (1QTR99-4QTR99) • (1.148) Remote Activated Munitions System. Completed EMD and testing; conducted Milestone (MS) III review for Type B receiver. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (1.968) ILM. Conduct MS II to enter engineering and manufacturing development (EMD); conduct system integration testing and critical design review. (1QTR00-4QTR00) • (0.524) SOFDK. Continue design, fabrication, and testing of a preplanned product improvement warhead; conduct Milestone (MS) III for large warhead. (1QTR00-4QTR00) • (2.220) Time Delay Firing Device. Initiate design, fabrication, and testing; conduct MS I/II to enter EMD. (1QTR00-4QTR00) 	

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FY 2001 PLAN:

- (2.956) Improved Limpet Mine (ILM). Complete engineering and manufacturing development (EMD) and testing; conduct MS III review for ILM. (1QTR01-4QTR01)
- (3.722) SOF Demolition Kit. Initiate design, fabrication and testing of several preplanned product improvement warheads. Complete EMD and conduct MS III review of a pre-planned product improvement warhead. (1QTR01-4QTR01)
- (5.171) Time Delay Firing Device (TDFD). Continue EMD complete subsystem testing and conduct system integration testing. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, Ordnance Acquisition	22.389	15.876	25.978	8.521	8.030	7.307	8.417	Cont.	Cont.

C. Acquisition Strategy:

- ILM. Program managed by Naval Sea Systems Command, PMS 325. Designs will be developed by Naval Surface Warfare Centers.
- TDFD. Program managed by Office of Project Manager for Mines, Countermines and Demolitions, PM-MCD. Designs will be developed by Army research and development centers.

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project S800											
<ul style="list-style-type: none"> SOF Demolition Kit. Program managed by Office of Project Manager for Mines, Countermine and Demolitions, PM-MCD. Designs will be developed by Army research and development centers. 																
					<u>FY99</u>			<u>FY00</u>			<u>FY01</u>					
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4
SOF Demolition Kit																
Milestone (MS) III (Large Warhead)																
Pre-Planned Product Improvement (P3I) Warhead Design and Testing																
MS III of a P3I Warhead																
Remote Activated Munitions System																
MS III (Type B Receiver)																
Improved Limpet Mine																
MS I																
MS II																
System Integration Testing/Critical Design Review																
MS III																
Time Delay Firing Device																
MS I/II																
Subsystem Testing/System Integration Testing																

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT S800							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev	ALLOT	VARIOUS		2.436	VARIOUS	2.673	VARIOUS	7.312	VARIOUS	Cont.	Cont.
Subtotal Product Dev				2.436		2.673		7.312		Cont.	Cont.
Remarks: Supports ILM, DK, RAMS, Gunship Ammo and TDFD.											
Development Spt	ALLOT	VARIOUS		0.021	VARIOUS	0.031	VARIOUS	0.085	VARIOUS	Cont.	Cont.
Training Development	ALLOT	VARIOUS		0.100	VARIOUS	0.091	VARIOUS	0.253	VARIOUS	Cont.	Cont.
Integrated Logistics Support	ALLOT	VARIOUS		0.400	VARIOUS	0.432	VARIOUS	1.181	VARIOUS	Cont.	Cont.
Configuration Management	ALLOT	VARIOUS		0.020	VARIOUS	0.031	VARIOUS	0.084	VARIOUS	Cont.	Cont.
Technical Data	ALLOT	VARIOUS		0.021	VARIOUS	0.031	VARIOUS	0.084	VARIOUS	Cont.	Cont.
Subtotal Spt				0.562		0.616		1.687		Cont.	Cont.
Remarks: Supports ILM, DK, RAMS, Gunship Ammo and TDFD.											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT S800							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Developmental Test & Eval	ALLOT	VARIOUS		0.553	VARIOUS	0.618	VARIOUS	1.688	VARIOUS	Cont.	Cont.
Operational Test & Eval	ALLOT	VARIOUS		0.197	VARIOUS	0.205	VARIOUS	0.562	VARIOUS	Cont.	Cont.
Subtotal T&E				0.750		0.823		2.250		Cont.	Cont.
Remarks: Supports ILM, DK, RAMS, Gunship Ammo and TDFD.											
Contractor Engineering Spt	ALLOT	VARIOUS		0.100	VARIOUS	0.100	VARIOUS	0.100	VARIOUS	Cont.	Cont.
Government Engineering Spt	ALLOT	VARIOUS		0.050	VARIOUS	0.050	VARIOUS	0.050	VARIOUS	Cont.	Cont.
Program Management Spt	ALLOT	VARIOUS		0.400	VARIOUS	0.400	VARIOUS	0.400	VARIOUS	Cont.	Cont.
Travel				0.050	VARIOUS	0.050	VARIOUS	0.050	VARIOUS	Cont.	Cont.
Subtotal Management				0.600		0.600		0.600		Cont.	Cont.
Remarks: Management Support funds PMs for each of the programs executed; since there is more than one program, more than one PM is funded. This is more or less a fixed cost per program. Supports ILM, DK, RAMS, Gunship Ammo and TDFD.											
Total Cost			0.000	4.348		4.712		11.849		Cont.	Cont.
Remarks:											

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
SF100, Aviation Systems Advanced Development		4.365	17.372	17.976	47.198	46.598	33.865	37.773	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project investigates the applicability of current and maturing technologies that have great potential for direct application to the development and procurement of specialized equipment to meet Special Operations Forces (SOF)-unique aviation requirements. Timely application of SOF-unique technology is critical and necessary to meet requirements in such areas as: Low Probability of Intercept/Low Probability of Detection (LPI/LPD) radios and radar; LPI formation/rendezvous flight; digital terrain elevation data and electronic order of battle; digital maps; LPI radar altimeter; display technology; situational awareness; near-real-time intelligence to include data fusion; laser radar/millimeter wave radar obstacle avoidance; imagery; threat detection and avoidance; electronic support measures for threat geolocation and specific emitter identification; navigation; target detection and identification technologies; aerial refueling; and studies for future SOF aircraft requirements. Sub-projects include:

- AC-130H Weight Reduction. This program removes weight by redesigning the current 40mm and 105mm ammunition racks using a lighter weight material, rebuilding the 40mm and 105mm trainable gun mounts using lighter weight material, and removing noncritical armor.
- AC-130H Low Light Level TV. This program upgrades/replaces the following high-failure components: AJQ-24 Pedestal, AAQ-7 Laser Illuminator, and AXQ-17 Camera.
- AC-130U Pre-Planned Product Improvement (P3I). Provides correction of system deficiencies and enhancement of mission capabilities for 13 AC-130U Gunships.

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100
<ul style="list-style-type: none"> • Aviation Engineering Analysis. Provides a rapid response capability to support SOF fixed-wing aircraft. The purpose is to correct systems deficiencies, improve asset life, and enhance mission capability through the means of feasibility studies and engineering analyses. This sub-project provides the engineering required to improve the design and performance integrity of the aircraft support systems, sub-systems equipment, and embedded computer software as they relate to the maintenance, overhaul, repair, quality assurance, modifications, material improvements and service life extensions. • MC-130H Aerial Refueling. This program extends the range of vertical lift aircraft operating in sensitive/denied airspace. Integrates air refueling system into MC-130H 1553 data bus. Includes enlarged paratroop door windows, internal fuel tanks, and non-developmental item aerial refueling pods. • Common Avionics Architecture for Penetration (CAAP). This program initiates development of terrain following/terrain avoidance radar having Low Probability of Intercept/Low Probability of Detection (LPI/LPD) characteristics, and it initiates development of an enhanced situational awareness system which consolidates threat data from on and off-board sensors into a single coherent image to the crew, to include software development for electronic warfare (EW) data bus to coordinate on-board defensive system response to threats. <p>This project also addresses consolidated technical risk reduction efforts for advanced SOF systems, subsystems and equipment. Such efforts will support substantial life-cycle cost savings via timely cost avoidance and cost savings from common-function/multi-platform subsystems.</p> <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (0.455) AC-130H Weight Reduction. Completed engineering management support on prototype ammunition rack and gun mounts. (1QTR99-4QTR99) 	

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100
<ul style="list-style-type: none"> • (3.185) AC-130U Pre-Planned Product Improvement (P3I) (Electronic Warning Upgrade). Began development efforts for replacement of the gunship's ALR-56 radar warning receiver to solve performance problems and increase commonality with other SOF Weapon Systems. (2QTR99) • (0.725) Aviation Engineering Analysis. Continued engineering analysis of SOF fixed wing aircraft avionics and sensors. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (2.809) AC-130U Pre-Planned Product Improvement (P3I) (Studies). Fund studies to solve performance problems and increase commonality with other SOF platforms. (3QTR00) • (1.574) AC-130U P3I (Comm Upgrade). Implement permanent mission enhancement modification and develop corrections for communication management system deficiencies identified during flight test. Also, fund integration of JCS-directed narrowband SATCOM capability. (1QTR00) • (0.548) Aviation Engineering Analysis. Continue engineering analysis of SOF fixed wing aircraft avionics and sensors. (1QTR00-4QTR00) • (5.149) Common Avionics Architecture for Penetration (CAAP). Initiate design/prototyping of the Low Probability of Intercept/Low Probability of Detection (LPI/LPD) Terrain Following/Terrain Avoidance (TF/TA) navigation system on vertical lift aircraft. This effort includes hardware/software architecture design and procuring of hardware for test bed aircraft. (3QTR00) • (7.292) MC-130H Air Refueling. Begin development of paratroop door window group A, feasibility analysis of internal fuel tank(s), and integration of aerial refueling system under Integrated Weapon System Support Program contract. (3QTR00-4QTR00) 	

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100		

FY 2001 PLAN:

- (0.488) AC-130U Pre-Planned Product Improvement (P3I). Begin development of a selectable beam-size laser illuminator for precise location and identification of ground targets for the All Light Level Television. (1QTR01)
- (0.491) Aviation Engineering Analysis. Continue engineering analysis of SOF fixed wing aircraft avionics and sensors. (1QTR01-4QTR01)
- (10.166) Common Avionics Architecture for Penetration (CAAP). Continue design/prototyping of Low Probability of Detection (LPI/LPD)/Terrain Following/Terrain Avoidance (TF/TA) radar and Enhanced Situational Awareness architecture. (2QTR01)
- (6.831) MC-130H Air Refueling. Continue development/integration of aerial refueling system into 1553 data bus, aircraft plumbing and cargo compartment, and begin ground and flight testing. Complete Foreign Comparative Test. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, C-130 Mods'	29.097	18.053	19.030	17.807	44.822	36.223	19.951	Cont.	Cont.
PROC,, Aircraft Support					8.123	26.689	56.044	Cont.	Cont.

Includes C-130 Modifications sub-line item funds for AC-130H Low Light Level Television replacement, AC-130U P3I, AC-130H Weight Reduction, MC-130H Air Refueling Modification, and ALR-69 and ALQ-172 antennas; and Aircraft Support sub-line item funds for Common Avionics Architecture for Penetration.

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100
<p>C. <u>Acquisition Strategy:</u></p> <ul style="list-style-type: none"> • AC-130U Pre-Planned Product Improvement (P3I) studies. Funds follow-on studies under Integrated Weapon System Support Program associated with reduced total ownership cost initiative. • AC-130U P3I, Communications Upgrade. Modify existing off-the-shelf radios to provide narrowband satellite communication capability and correct existing communications deficiencies. • AC-130U P3I, All Light Level Television (ALLTV) laser beam shaping. Maximize use of nondevelopmental laser technology to integrate improvements to the laser illuminator. Use Integrated Weapon System Support Program contract. • Common Avionics Architecture for Penetration (CAAP). Develop a common technical solution satisfying fixed and rotary wing requirements for penetration missions. The program will leverage knowledge gained on previously conducted advanced technology demonstrations to implement a low risk solution. The fixed wing application of CAAP will be accomplished by merging with the USAF C-130 Avionics Modernization Program. Optimal integration for vertical lift application is under investigation and will be implemented separately. • MC-130H Aerial Refueling. Maximize use of nondevelopmental item technology to develop, design, build and test an integrated aerial refueling system via IWSSP contract. The first phase of this program is a Foreign Comparative Test (FCT) of the MK 32B-902E Aerial Refueling POD. The FCT contract includes options to support Engineering, Manufacturing and Development and production installs. 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000											
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF100											
					<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
					1	2	3	4	1	2	3	4	1	2	3	4
<u>D. Schedule Profile</u>																
AC-130 P3I Studies											x					
AC-130U ALR-56 Replacement						x										
MC-130H Aerial Refueling Development Contract Award											x					
MC-130H Aerial Refueling Development/Integration/Test											x	x	x	x	x	
AC-130U Communications Upgrade									x							
AC-130U ALLTV Laser Illuminator Shaping													x			
C-130 CAAP Development Contract Award											x					
C-130 CAAP Hardware/Software Design/Prototyping											x	x	x	x	x	

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT SF100							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/ Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Development											
AC-130U (Equip)	SS/CPAF	Bell/Boeing		3.185	VARIOUS	1.574	OCT 99	0.488	TBD	Cont.	Cont.
CAAP	TBD	TBD				5.149	MAR 00	10.166	TBD	Cont.	Cont.
MC-130 Air Ref (P3I)	VARIOUS	Bell/Boeing				7.292	JUN 00	6.831	MAR 01	Cont.	Cont.
AC-130H Weight Reduction	MIPR	SOFSA, Lexington, KY		0.035	DEC 98						0.035
Subtotal Product Dev				3.220		14.015		17.485		Cont.	Cont.
Remarks:											
Support Costs											
Analyses/Technical Studies	VARIOUS	VARIOUS				0.548	VARIOUS	0.491	VARIOUS	Cont.	Cont.
Engineering/Studies											
AC-130U Gunship	VARIOUS	VARIOUS				2.809	VARIOUS			Cont.	Cont.
MC-130H Air Refueling	MIPR	46TH TW, Hurlburt Fld, FL		0.300	MAY 99					Cont.	Cont.
ALE-47	SS/FFP	Boeing		0.200	APR 99					Cont.	Cont.
Subtotal Spt				0.500		3.357		0.491		Cont.	Cont.
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT SF100							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/ Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Dev Test & Evaluation											
AC-130H Testing	VARIOUS	VARIOUS		0.135	VARIOUS						0.135
Subtotal T&E				0.135							0.135
Remarks:											
Support											
SAIC (CAAP)	SS/FFP	SAIC, GA		0.225	JAN 99						0.225
SSAI (AC-130H Weight)	SS/FFP	SSAI, GA	0.100	0.265	SEP 99						0.365
Travel (AC-130H Weight)	N/A	WR-ALC, GA	0.010	0.020	N/A						0.030
Subtotal Management			0.110	0.510							0.620
Remarks:											
Total Cost			0.110	4.365		17.372		17.976		Cont.	Cont.
Remarks:											

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)						DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF200							
COST (Dollars in Millions)		FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
SF200, CV-22 SOF Osprey		0	32.179	40.461	39.264	34.324	10.297	19.597	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides capabilities necessary to meet Special Operations Forces (SOF) operational requirements. The CV-22 acquisition program delayed the incorporation of some operational capabilities until the completion of a block 10 (formerly Pre-Planned Product Improvement) CV-22 program. This strategy was based on a developmental funding cap imposed by the Department of the Navy and concerns over the technical maturity of parallel acquisition programs. Block 10 consists of integrating Directional Infrared Countermeasures (DIRCM), Troop Commander situational awareness connections, ALE-47 control relocation, 2nd forward firing chaff and flare dispenser, AVR-2A laser detection, AAR-54 warning sensor upgrade, hover couple altitude to 5 feet, and Dual Digital Map. The block 10 Required Assets Available (RAA) are necessary to achieve Initial Operational Capability. Remaining block 10 activity is necessary to achieve Full Operational Capability.

FY 1999 ACCOMPLISHMENTS: N/A

FY 2000 PLAN:

- (22.184) Begin development of RAA block 10 changes. (2QTR00-4QTR00)
- (9.000) Begin DIRCM laser integration. (2QTR00-4QTR00)
- (0.995) Begin program office support for block 10. (1QTR00-4QTR00)

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE	FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF200		

FY 2001 PLAN:

- (11.948) Continue development of Required Assets Available (RAA) block 10 changes. (1QTR01-4QTR01)
- (23.620) Begin development of post initial operational capability block 10 changes. (1QTR01-4QTR01)
- (0.998) Continue program office support for block 10 program. (1QTR01-4QTR01)
- (3.895) Continue risk reduction for Suite of Integrated Radio Frequency Countermeasures, CV-22 Joint Avionics System Software integration, and cost reduction initiatives for procurement and sustainment. (1QTR01-4QTR01)

B. Other Program Funding Summary

	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	To <u>Complete</u>	Total <u>Cost</u>
PROC, CV-22 SOF Osprey	3.983	3.572	8.533	103.782	127.015	145.553	160.931	202.518	755.887

C. Acquisition Strategy:

- The CV-22 program is managed through the Navy V-22 program office (NAVAIR PMA-275). This ensures that the CV-22 changes are incorporated into the ongoing V-22 production line with minimum impact. RDT&E funding will be sent from USSOCOM to PMA-275 to place on contract with the V-22 prime contractor, beginning in FY 2000. The RDT&E funding described will be used to fund block 10 (formerly Pre-Planned

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160404BB Special Operations Tactical Systems Development / Project SF200
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Product Improvement) development. Block 10 capability is required for initial operational capability. Funding for the baseline CV-22, known as block 0, is embedded in the Navy budget. Block 20 and 30 are essential capability improvements, but are not presently funded.

	<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
<u>D. Schedule Profile</u>	1	2	3	4	1	2	3	4	1	2	3	4
Block 10 Required Assets Available Development					x	x	x	x	x	x	x	x
Post-Initial Operational Capability Block 10 Development									x	x	x	x

Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT SF200							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/ Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev	SS/CPAF	NAVAIR/PMA-275				28.689	JAN 00	36.306	NOV 00	Cont.	Cont.
Award Fees						2.495	JAN 00	3.157	NOV 00	Cont.	Cont.
Subtotal Product Dev						31.184		39.463		Cont.	Cont.
Remarks:											
Developmental Test & Eval											
Operational Test & Eval											
Subtotal T&E											
Remarks:											

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160404BB SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT / PROJECT SF200							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/ Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Contractor Engineering Spt Government Engineering Spt Travel Labor (Research Personnel) Overhead	ALLOT	NAVAIR/PMA-275				0.995	OCT 99	0.998	OCT 00	Cont.	Cont
Subtotal Management						0.995		0.998		Cont.	Cont
Remarks:											
Total Cost											
						32.179		40.461		Cont.	Cont.
Remarks:											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE PE1160405BB Spec Operations Intelligence Systems Development						
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160405BB	8.417	5.138	3.022	1.574	1.659	1.432	1.460	Cont.	Cont.
S400 SO INTELLIGENCE	8.417	5.138	3.022	1.574	1.659	1.432	1.460	Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>This program element provides for the identification, development, and testing of Special Operations Forces (SOF) intelligence equipment to identify and eliminate deficiencies in providing timely intelligence to deployed forces. The following distinct sub-projects address the primary areas of intelligence dissemination, sensor systems, integrated threat warning to SOF mission platforms, and tactical exploitation of national system capabilities. USSOCOM has developed an overall strategy to ensure that Command, Control, Communications, Computers, and Intelligence (C4I) systems continue to provide SOF with the required capabilities into the 21st century. USSOCOM's C4I systems comprise an integrated network of systems providing positive command and control and timely exchange of intelligence and threat warning to all organizational echelons. The C4I systems that support this new architecture will employ the latest standards and technology by transitioning from separate systems to full integration with the infosphere. The infosphere will allow SOF elements to operate with any force combination in multiple environments. The C4I programs funded in this project are grouped by the level of organizational element they support: Operational Element (Team), Above Operational Element (Deployed), and Above Operational Element (Garrison).</p> <p>Change Summary Explanation:</p> <p>Funding:</p> <p>FY 2000 increase is a net result of funds appropriated by Congress for the Joint Threat Warning System (\$2.7M) and the Special Operations Tactical Video System (SOTVS) (\$1.3M), as well as reductions for project cost share of the Small Business Innovative Research program, Congressionally-mandated rescission of \$118K, and revised Administration inflation assumptions.</p> <p>FY 2001 increase is a net result of funds added for development/operational test and evaluation of the SOTVS (version SV2) and project cost share of revised Administration inflation assumptions.</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2000		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE PE1160405BB Spec Operations Intelligence Systems Development		
Schedule: None.			
Technical: None.			
B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget	8.793	1.407	2.899
Appropriated Value	8.805	5.407	
Adjustments to Appropriated Value / President's Budget	(.388)	(.269)	.123
Current Budget Submit	8.417	5.138	3.022

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000				
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160405BB Special Operations Intelligence Systems Development / Project S400						

COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S400, SOF Intelligence R&D	8.417	5.138	3.022	1.574	1.659	1.432	1.460	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides for the identification, development, and testing of Special Operations Forces (SOF) intelligence equipment to identify and eliminate deficiencies in providing timely intelligence to deployed forces. The following distinct sub-projects address the primary areas of intelligence dissemination, sensor systems, integrated threat warning to SOF mission platforms, and tactical exploitation of national system capabilities. USSOCOM has developed an overall strategy to ensure that Command, Control, Communications, Computers, and Intelligence (C4I) systems continue to provide SOF with the required capabilities into the 21st century. USSOCOM's C4I systems comprise an integrated network of systems providing positive command and control and timely exchange of intelligence and threat warning to all organizational echelons. The C4I systems that support this new architecture will employ the latest standards and technology by transitioning from separate systems to full integration with the infosphere. The infosphere will allow SOF elements to operate with any force combination in multiple environments. The C4I programs funded in this project are grouped by the level of organizational element they support: Operational Element (Team), Above Operational Element (Deployed), and Above Operational Element (Garrison). Sub-projects include:

OPERATIONAL ELEMENT (TEAM)

- PRIVATEER. PRIVATEER is part of an evolutionary signal intelligence system migration and acquisition program that provides a permanent full spectrum radar and communications early warning capability aboard Cyclone-class Patrol Coastal (PC) and the MK V Special Operations Craft (SOC). The PC configuration is confined to the electronic surveillance mission area, while the MK V SOC configuration has been expanded to include an electronic attack capability for self-defense. A subset of the Joint Threat Warning System, PRIVATEER hosts a common software architecture that controls a variety of hardware modules designed to satisfy the unique platform requirements of each ship class. System configuration

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<p>provides the equipment necessary to monitor and provide direction finding on radar and communications signals of interest. Also provides broadcast threat warning capability. Architecture is Joint Deployable Intelligence Support System/Joint Maritime Communications and Intelligence Support System compliant with UNIX-based software.</p> <ul style="list-style-type: none"> • SILENT SHIELD. The SILENT SHIELD is part of an evolutionary Joint Threat Warning System (JTWS) migration being developed to support SOF-wide operations. System development emphasizes a rapid prototyping effort to develop, test and field systems that provide direct threat warning and enhanced situational awareness data to SOF aircrews at the collateral SECRET level. • National Systems Support to SOF (NSSS). NSSS is a project to introduce and integrate national systems capabilities into the SOF force structure and operations. NSSS activities include increasing national systems awareness, demonstrating the tactical utility of national system data, testing technology and evaluating operational concepts in biennial Joint Staff Special Projects, and transitioning promising concepts and technologies into the SOF materiel inventory. • SOF SIGINT Manpack System (SSMS)/Joint Threat Warning System (JTWS). JTWS develops a modular, scaleable system that consists of user defined, integrated common hardware modules driven by an interoperable software architecture and configurable for use in manpack, unattended, and platform versions (ground, aircraft, and maritime). JTWS functional requirements include communications monitoring and direction finding, and receipt and correlation of near-real-time tactical intelligence broadcasts. <p>ABOVE OPERATIONAL ELEMENT (DEPLOYED)</p> <ul style="list-style-type: none"> • SOF Intelligence Vehicle (SOF IV). The SOF IV is a deployable, automated, multi-source intelligence processing and dissemination system. The SOF IV extends the Joint Deployable Intelligence Support System/Special Operations Command Research, Analysis and Threat Evaluation System architecture to the Joint Special Operations Task Force level permitting automated interface to all theater-level intelligence data handling systems. SOF IV provides for the receipt, processing, and manipulation of near-real-time intelligence data in order to produce highly tailored, accurate and 	

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<p>timely intelligence products to support deployed SOF. The system employs a high mobility multi-purpose wheeled vehicle configured with a rigid wall, standard integrated command post shelter to house computer servers, mass storage devices, and communications equipment, and a tent extension for the remote operation of analyst workstations. It incorporates DOD Intelligence Information System and Joint Deployable Intelligence Support System standards and products in accordance with JCS direction. A second configuration of the system also exists with identical performance capabilities using a modular, transit case design. SOF Intelligence Vehicle is an Evolutionary Acquisition Program. The acquisition strategy includes a block upgrade process that will occur over the life of the system.</p> <ul style="list-style-type: none"> • Special Operations Tactical Video System (SOTVS). SOTVS will provide the capability to forward digital/video imagery near-real-time via current and planned future organic SOF tactical communication systems in support of surveillance and reconnaissance missions. This manpackable tactical system will consist of three versions: standard version using still digital cameras (SV1A); standard version using video cameras (SV1B); and a waterproof version using still digital cameras (SV2). <p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (1.825) National Systems Support to SOF (NSSS). Participated in JCS and theater CINC advanced concepts technology demonstrations which continue to evaluate National Technical Means support to amphibious operations, overall interoperability and support of combined SOF and conventional operations. Assess technology and operational utility of HAMLET's FOREST and HAMLET's TRACK. Provided systems engineering and technical assistance. (1QTR99-4QTR99) • (0.782) SILENT SHIELD. Completed Development, Test and Evaluation of Engineering Development Model (EDM). Conducted Operational Test and Evaluation of EDM. MS III granted for system integration on TALON II Aircraft. Conducted integration and testing on other air platforms (HH53, CV22, H130, 130, etc.). (1QTR99-4QTR99) 		

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APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160405BB Special Operations Intelligence Systems Development / Project S400
<ul style="list-style-type: none"> • (3.724) SOF IV. Developed and tested block upgrades to include test, analysis and discovery of future technologies for implementation within the SOF IV Evolutionary Acquisition strategy. (2QTR99-4QTR99) • (2.086) SOF SIGINT Manpack System (SSMS)/ Joint Threat Warning System (JTWS). Conducted software development for the SSMS and JTWS. (2QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (2.568) Joint Threat Warning System (JTWS). Continue software development/migration of the JTWS. (2QTR00-4QTR00) • (1.106) National Systems Support to SOF (NSSS). Continue to participate in JCS and theater CINC advanced concepts technology demonstrations which continue to evaluate National Technical Means support to amphibious operations, overall interoperability and support of combined SOF and conventional operations. Continue to assess technology and operational utility of HAMLET's FOREST and HAMLET's TRACK. Provide systems engineering and technical assistance. (1QTR00-4QTR00) • (1.464) Special Operations Tactical Video System (SOTVS). Conduct systems integration of SOTVS test articles. Conduct concurrent developmental and operational test & evaluation. (2QTR00-4QTR00) <p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (1.355) NSSS. Continue to participate in JCS and theater CINC advanced concepts technology demonstrations which continue to evaluate national technical means support to amphibious operations, overall interoperability and support of combined SOF and conventional operations. Continue to 	

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000																								
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160405BB Special Operations Intelligence Systems Development / Project S400																										
<p>assess technology and operational utility of HAMLET's FOREST and HAMLET's TRACK. Provide systems engineering and technical assistance. (1QTR01-4QTR01)</p> <ul style="list-style-type: none"> (1.568) PRIVATEER. Develop, integrate and test the Block 3 evolutionary technology insertion. (1QTR01-4QTR01) (0.099) SOTVS. Conduct development and operational test and evaluation on version SV2. (1QTR01-2QTR01) <p>B. <u>Other Program Funding Summary</u></p> <table border="1"> <thead> <tr> <th></th> <th><u>FY99</u></th> <th><u>FY00</u></th> <th><u>FY01</u></th> <th><u>FY02</u></th> <th><u>FY03</u></th> <th><u>FY04</u></th> <th><u>FY05</u></th> <th><u>To Complete</u></th> <th><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>PROC, SOF Intel Systems</td> <td>23.000</td> <td>19.982</td> <td>32.309</td> <td>7.678</td> <td>8.757</td> <td>11.430</td> <td>15.961</td> <td>Cont.</td> <td>Cont.</td> </tr> </tbody> </table> <p>C. <u>Acquisition Strategy:</u></p> <ul style="list-style-type: none"> PRIVATEER is an evolutionary acquisition program that uses a modular, commercial off-the-shelf (COTS) and an Open Systems Environment. As an evolutionary acquisition program, PRIVATEER will continue to introduce systems improvements via evolutionary technology insertions tailored to satisfy specific platform requirements. PRIVATEER will migrate to the Joint Threat Warning System. Special Operations Tactical Video System (SOTVS) is predominantly a COTS/non-developmental item acquisition program. Certain subcomponents may require some developmental effort. 											<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	<u>To Complete</u>	<u>Total Cost</u>	PROC, SOF Intel Systems	23.000	19.982	32.309	7.678	8.757	11.430	15.961	Cont.	Cont.
	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	<u>To Complete</u>	<u>Total Cost</u>																				
PROC, SOF Intel Systems	23.000	19.982	32.309	7.678	8.757	11.430	15.961	Cont.	Cont.																				

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RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000											
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7					R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160405BB Special Operations Intelligence Systems Development / Project S400											
					<u>FY99</u>				<u>FY00</u>				<u>FY01</u>			
<u>D. Schedule Profile</u>					1	2	3	4	1	2	3	4	1	2	3	4
National Systems Support to SOF Participation in Advanced Concepts Technology Demonstrations					x	x	x	x	x	x	x	x	x	x	x	x
SILENT SHIELD																
Integration and Test					x	x	x	x								
Milestone III – Talon II Aircraft								x								
 PRIVATEER Evolutionary Technology Insertion																
Software Development, Integration and Testing													x	x	x	x
 SOF SIGINT Manpack System/Joint Threat Warning System (JTWS)																
JTWS Software Development						x	x	x	x	x	x	x				
SOF Intelligence Vehicle Integration and Test						x	x	x								
Special Operations Tactical Video Sys Integration and Test										x	x	x	x	x		

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160405BB SPECIAL OPERATIONS INTELLIGENCE SYSTEMS DEVELOPMENT / PROJECT S400							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Primary Hardware Dev	MIPR	SPAWAR, Charleston, SC	2.306								2.306
	FFP/SS	Qual-Tron, Inc., Tulsa, OK	0.050								0.050
	VARIOUS	VARIOUS	40.076	1.953	MAY 99	1.237	FEB00				43.266
Ancillary Hardware Dev											
Systems Engineering	FP/SS	Wave Science, Inc, E Rochester, NY	0.005								0.005
	MIPR	Naval Undersea Warfare, Kpt, WA	0.090								0.090
Materiel/Equipment	MIPR	Naval Air Warfare, St Inigoes, MD	0.282	0.949	FEB 99						1.231
	VARIOUS	VARIOUS		0.677	JUN 99	0.624	DEC 99	0.859	DEC 00	Cont.	Cont.
	MIPR	SPAWAR, Charleston, SC	0.813								0.813
Subtotal Product Dev			43.622	3.579		1.861		0.859		Cont.	Cont.
Development Spt	MIPR	ESC, Hanscom AFB, MA	0.089	0.255	MAR 99						0.344
Software Dev/Integ	MIPR	SPAWAR, Charleston, SC		0.145	AUG 99						0.145
	MIPR	Naval Systems Mgt. Activity, VA		1.180	JUL 99						1.180
	MIPR	SPAWAR, Charleston, SC	1.822			2.568	JAN00	1.568	DEC 00	Cont.	Cont.
	MIPR	Pt. Mugu, CA	0.050								0.050
	FFP/C	Delfin Systems, Santa Clara, CA		0.133	FEB 99						0.133
	MIPR	BTG, Inc., Fairfax, VA	1.205								1.205
Software Spt	MIPR	GSA, Kansas City, MO	0.130								0.130
Training Development	MIPR	GSA, Kansas City, MO	0.080								0.080
	MIPR	Naval Air Warfare, St Inigoes, MD	0.030								0.030
Integrated Logistics Spt											
Configuration Management	MIPR	SPAWAR, San Diego, CA	0.025								0.025
Technical Data	MIPR	Naval Air Warfare, St Inigoes, MD	0.090								0.090
Subtotal Spt			3.521	1.713		2.568		1.568		Cont.	Cont.

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Exhibit R-3 COST ANALYSIS						DATE: FEBRUARY 2000					
APPROPRIATION / BUDGET ACTIVITY				PE 1160405BB SPECIAL OPERATIONS INTELLIGENCE SYSTEMS DEVELOPMENT / PROJECT S400							
RDT&E DEFENSE-WIDE / 7											
Actual or Budget Value (\$ in millions)											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	Budget Cost FY99	Award Date FY99	Budget Cost FY00	Award Date FY00	Budget Cost FY01	Award Date FY01	To Complete	Total Program
Devel Test & Eval	MIPR	SPAWAR, Charleston, SC	0.258	0.372	MAR99						0.630
	MIPR	JTIC, Ft Huachuca, AZ	0.172								0.172
OT&E	MIPR	SPAWAR, Charleston, SC	0.350	1.387	FEB 99						1.737
	MIPR	DESA, Kirtland, NM	0.217								0.217
	MIPR	18 FLTS, Hurlburt Field, FL		0.027	NOV 98						0.027
GFE	MIPR	Naval Air Warfare, St Inigoes, MD	0.564	0.591	MAY 99						1.155
	TBD	TBD				0.060	JUN 00	0.090	NOV00		0.150
	MIPR	Naval Air Warfare, St Inigoes, MD	0.398								0.398
Subtotal T&E			1.959	2.377		0.060		0.090		0.000	4.486
Government Engineering Spt	MIPR	SPAWAR, Charleston , SC									
Program Management Spt	CPFF/C	Booz-Allen & Hamilton, McLean, VA	2.162	0.601	OCT 98	0.158	OCT 99				Cont.
	MIPR	TBD				0.417	OCT99	0.424	OCT00	Cont.	Cont.
Travel	MIPR	SPAWAR, Charleston , SC	0.394	0.093	MAR 99						0.487
	N/A	USSOCOM, MacDill AFB, FL	0.043	0.054	FY99	0.074	FY00	0.081	FY01	Cont.	Cont.
Subtotal Management			2.599	0.748		0.649		0.505		Cont.	Cont.
Remarks:											
Total Cost			51.701	8.417		5.138		3.022		Cont.	Cont.
Remarks:											

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE FEBRUARY 2000			
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE PE1160407BB SOF Medical Technology Development						
COST (Dollars in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
PE1160407BB	1.945	3.863	2.065	2.107	2.149	2.190	2.229	Cont.	Cont.
S275 SOF MEDICAL TECHNOLOGY	1.945	3.863	2.065	2.107	2.149	2.190	2.229	Cont.	Cont.
<p>A. Mission Description and Budget Item Justification</p> <p>This program element provides studies, non-system exploratory advanced technology development and evaluations. The focus is on medical technologies, centering on physiologic, psychologic, and ergonomic factors affecting the ability of Special Operations Forces (SOF) to perform their missions. Current equipment and technology does not meet force requirements. The unique nature of special operations requires unique approaches to combat casualty care, medical equipment and other life support capabilities including life support for high altitude parachuting, combat swimming and other SOF unique missions. This program provides guidelines for the development of selection and conditioning criteria, thermal protection, decompression procedures, combat casualty procedures and life support systems. The program supports the development and evaluation of biomedical enhancements for the unique requirements of all SOF in the conduct of their diverse missions.</p> <p>Change Summary Explanation:</p> <p>Funding:</p> <p>FY 2000 increase is a net result of additional funds appropriated by Congress for the Special Operations Medical Diagnostic System (\$2.0M), as well as rescission of \$63K, for project cost share of the Small Business Innovative Research program, Congressionally-mandated reductions, and revised Administration inflation assumptions.</p> <p>FY 2001 decrease is project cost share of revised Administration assumptions.</p> <p>Schedule: None.</p> <p>Technical: None.</p>									

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE		
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7		R-1 ITEM NOMENCLATURE PE1160407BB SOF Medical Technology Development		
B. Program Change Summary		FY 1999	FY 2000	FY 2001
Previous President's Budget		1.962	2.039	2.078
Appropriated Value		2.015	4.039	
Adjustments to Appropriated Value / President's Budget		(.070)	(.176)	(.013)
Current Budget Submit		1.945	3.863	2.065

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)					DATE FEBRUARY 2000						
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB SOF Medical Technology Development / Project S275								
COST (Dollars in Millions)			FY99	FY00	FY01	FY02	FY03	FY04	FY05	Cost to Complete	Total Cost
S275, SOF Medical Technology R&D			1.945	3.863	2.065	2.107	2.149	2.190	2.229	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project provides studies, non-system exploratory advanced technology development and evaluations. The focus is on medical technologies, centering on physiologic, psychologic, and ergonomic factors affecting the ability of Special Operations Forces (SOF) to perform their missions. Current equipment and technology does not meet force requirements. The unique nature of special operations requires unique approaches to combat casualty care, medical equipment and other life support capabilities including life support for high altitude parachuting, combat swimming and other SOF unique missions. This project provides guidelines for the development of selection and conditioning criteria, thermal protection, decompression procedures, combat casualty procedures and life support systems. The project supports the development and evaluation of biomedical enhancements for the unique requirements of all SOF in the conduct of their diverse missions. This effort is defined by the following seven areas of investigation:

- Combat casualty management will: (1) review the emergency medical equipment currently used in the SOF community and compare it to currently available civilian technology, and provide field testing of emergency medical equipment in the adverse environmental conditions encountered by SOF; (2) evaluate current tactical combat casualty care doctrine to ensure consideration of the wide variety of tactical scenarios encountered and apply the latest concepts in casualty care to these circumstances; and (3) develop CD-ROM and internet compatible automated programs to support SOF medical personnel information needs while operating in austere locations and medical interviews in multiple foreign languages.
- Decompression procedures for SOF diving operations will: (1) decrease the decompression obligation in SOF diving operations through the use of surface-interval oxygen breathing; and (2) investigate pre-oxygenation requirements for high-altitude SOF parachute operations.

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB SOF Medical Technology Development / Project S275	
<ul style="list-style-type: none"> • Exercise-related injuries will evaluate the effectiveness of applying sports medicine diagnostic, therapeutic, and rehabilitative techniques in management of the traumatic and overuse injuries commonly encountered among SOF. • Inhaled gas toxicology will evaluate the feasibility of using pharmacologic intervention to reduce or eliminate the possibility of central nervous system toxicity. • Medical sustainment training techniques will: (1) examine novel ways of providing and documenting medical sustainment training for SOF corpsmen and physicians; and (2) develop a system for constantly upgrading the medical expertise of SOF medical personnel by incorporating new research reports and clinical information into a CD-ROM based computer system which can be used by medical personnel in isolated duty circumstances. • Mission-related physiology will: (1) develop accurate measures to evaluate SOF mission-related performance; (2) evaluate the suitability of photorefractive keratectomy, a new refractive surgical procedure, for SOF personnel; (3) delineate nutritional strategies designed to help personnel apply known nutritional concepts to optimize performance in mission and training scenarios; (4) evaluate potential ergogenic agents as they apply to enhancing mission-related performance; (5) study the safety and efficacy of using caffeine to increase performance in sustained operations; (6) develop a quantitative test for night vision suitable for screening SOF candidates and study ways to enhance unaided night vision; (7) develop techniques for using oxygen to increase breathhold dive time; and (8) study pharmacologic measures to prevent acute mountain sickness in high altitude SOF operations. • Thermal protection will: (1) conduct a survey of available thermal protection garments and conduct a comparative study to determine their relative effectiveness at protecting personnel engaged in small boat operations; and (2) evaluate the efficacy of current thermal protective measures in maintaining combat swimmer performance. 		

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)		DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB SOF Medical Technology Development / Project S275	
<p>FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> • (0.555) Continued ongoing studies as follows: Tactical Combat Casualty Care in SOF Operations, Ergogenics in Special Operations, Special Operations Interactive Medical Training Program, SOF Computer-Assisted Medical Reference System, Evaluation of a Special Operations Resuscitative and Surgical Suite, and Oxygen Arterial Gas Embolism Studies. (1QTR99-4QTR99) • (1.390) Initiated new studies as follows: SOF Video-Based Interactive Tactical Combat Casualty Care Training, Characterization of SOF Mission-Related Performance Levels, Hemostatic Agents in Uncontrolled Hemorrhage, Adjuncts to Recompression Therapy in the Management of Dysbaric Diseases, Evaluation of Decompression Risk using the VVAL 18 Decompression Algorithm, Influence of Post-Landing Exercise on Altitude Decompression Sickness, Medical Informatics in Special Operations, High Altitude Parachute Operations after Diving, and Pelvic Ring Disruption Control. (1QTR99-4QTR99) <p>FY 2000 PLAN:</p> <ul style="list-style-type: none"> • (1.230) Continue ongoing studies as follows: Special Operations Interactive Medical Training Program, Tactical Combat Casualty Care in SOF Operations, Hemostatic Agents in Uncontrolled Hemorrhage, Evaluation of Decompression Risk using the VVAL 18 Decompression Algorithm, Influence of Post Landing Exercise on Altitude Decompression Sickness, High Altitude Parachute Operations after Diving, Ergogenics in Special Operations, and Characterization of SOF Mission-Related Performance Levels. (1QTR00) • (2.633) Initiate new studies as follows: SOF Community Norm on the Mission-Related Performance Battery, Laser Insitu Keratomileusis in Special Operations, Casualty Evacuation Delays and Outcomes, SOF Medical Skills Utilization Study, VVAL 18 Dive Planner, Enhancement of SOF Medical Readiness Training through Human Patient Simulators, Warm Water Diving Studies, Health Surveillance in Deployed SOF Personnel, Respiratory Muscle Training Operational Enhancements, and Special Operations Medical Diagnostic System. (2QTR00) 		

RDT&E PROJECT JUSTIFICATION SHEET (R-2A Exhibit)	DATE FEBRUARY 2000
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160407BB SOF Medical Technology Development / Project S275
<p>FY 2001 PLAN:</p> <ul style="list-style-type: none"> • (1.753) Continue ongoing studies as follows: Special Operations Interactive Medical Training Program, Tactical Combat Casualty Care in SOF Operations, Hemostatic Agents in Uncontrolled Hemorrhage, SOF Community Norm on the Mission-Related Performance Battery, Ergogenics in Special Operations, Laser Insitu Keratomileusis in Special Operations, Casualty Evacuation Delays and Outcomes, SOF Medical Skills Utilization Study, VVAL 18 Dive Planner, and Health Surveillance in Deployed SOF Personnel. (1QTR01) • (0.312) Initiate new studies as follows: Post-Landing Exercise and Decompression Sickness Risk in High Altitude Low Opening Parachute Operations, Emergency Oxygen Decompression Procedures for the VVAL 18 Algorithm, and Hypoxia and High Altitude Parachute Operations. (2QTR01) <p>B. <u>Other Program Funding Summary</u>: None.</p> <p>C. <u>Acquisition Strategy</u>: None.</p> <p>D. <u>Schedule Profile</u>: None.</p>	

FY 2001 Budget Estimate

Defense Security Cooperation Agency (DSCA)



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Exhibit R-2, RDT&E Budget Item Justification									Date: January 2000	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE					
RDT&E, Defense Wide, Budget Activity 6					PE 0603790T "NATO Cooperative R&D"					
COST (\$ in Millions)	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	Cost to Complete	Total Cost
Partnership for Peace Information Management System (PIMS)										
Total PE Cost	5.630	-	-	-	-	-	-		5.630	5.630

*These funds were previously contained in PE 0603790D8Z and were transferred to Acquisition & Technology in FY 2000.

A. Mission Description and Budget Item Justification

These funds will be used by the Services and Defense Agencies to initiate international cooperative research and development programs with the NATO and major non-NATO allies. The program implements the provisions of Title 10 U.S. Code, Section 2350a. The purpose of the program is to improve the defense acquisition system by sharing technology and jointly developing military equipment with our allies. This will also improve operational efforts by improving interoperability through use of similar equipment and improved interfaces.

The program is designed to provide "Venture Capital" to the services/agencies. The program is implemented by the services/agencies submission of candidate projects that will take advantage of international cooperative to jointly fulfill military requirements. Candidates are reviewed and approved by the USD(A&T). The services/agencies will complete an international agreement with an ally that fully defines the project responsibilities and objectives prior to release of funds. The funds are used to support all associated R&D costs including the identification of cooperative opportunities and administration of the program. The planned program is shown below. The final program will be reported separately as required by 10USC2350a(f). The program is complementary to a similar PE in each service that provides continuation funding for these programs.

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Exhibit R-2, RDT&E Budget Item Justification

Date: January 2000

B. Program Change Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
FY 2000 President's Budget	5.630	N/A	N/A	N/A
FY 2000 Appropriated Value	N/A	N/A	N/A	N/A
Adjustment to Appropriated Value				
Inflation Adjustment				
Current Budget Submit	5.630	N/A	N/A	N/A

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/R

E. Schedule Profile: N/R

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Exhibit R-2, RDT&E Budget Item Justification									Date: January 2000	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE					
RDT&E, Defense Wide, Budget Activity 6					PE 0605104T "Technical Studies, Support & Analysis"					
COST (\$ in Millions)	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	Cost to Complete	Total Cost
Partnership for Peace Information Management System (PIMS)										
Total PE Cost	.980	-	-	-	-	-	-		.980	.980

*These funds were previously contained in PE 0605104D and were transferred to Acquisition & Technology in FY 2000.

A. Mission Description and Budget Item Justification

The FY 1999 program is the primary source of funding for OSD international armaments cooperation 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 and Technology {USD(A&T)} in International Armaments Cooperation programs. analysis examine the implications and consequences of current and alternative policies, strategies and budgets, and are essential for understanding the complex international, political, economic, military, and technological environments in which defense acquisition decisions and opportunities take place.

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Exhibit R-2, RDT&E Budget Item Justification

Date: January 2000

B. Program Change Summary:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
FY 2000 President's Budget	.980	N/A	N/A	N/A
FY 2000 Appropriated Value	N/A	N/A	N/A	N/A
Adjustment to Appropriated Value				
Inflation Adjustment				
Current Budget Submit	.980	N/A	N/A	N/A

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/R

E. Schedule Profile: N/R

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Exhibit R-2, RDT&E Budget Item Justification									Date: January 2000	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE					
RDT&E, Defense Wide, Budget Activity 6					PE 0605110T "Partnership for Peace Information Management System"					
COST (\$ in Millions)	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	Cost to Complete	Total Cost
Partnership for Peace Information Management System (PIMS)										
Total PE Cost	-	-	1.932	1.922	1.920	1.962	2.005		Continuing	Continuing
<p>Since this effort is not Critical Technology Support it has been switch to PE 060512T.</p> <p>A. <u>Mission Description and Budget Item Justification</u></p> <p>The Partnership for Peace Information Management System (PIMS) is an OSD/C3I sponsored DOD leadership project supporting enhanced cooperation, bilaterally and multilaterally, in accordance with US policy and to US benefit. Firmly based on priority requirements, the Program has established a common, real-time information infrastructure which has given allies and Partner countries the ability to access and exchange information critical to the cooperative growth activities underpinning the spirit of PfP. PIMS is part of the NATO Enlargement Facilitation Act of 1996 and implements the Congressional endorsement for the modernization of Defense capabilities in eligible PfP countries relative to their telecommunications infrastructures. R&D funding is essential to ensuring PIMS can support this mandate.</p> <p>In order for PIMS to effectively support PfP preparation for future coalition initiatives, it must develop a full range of databases and advanced IT applications to support the practical aspects of US and NATO-approved PfP cooperative activities. In addition, special capabilities such as mapping and geodesy, multinational digitized imagery, and data derived from remote sensing technologies must also be integrated into PIMS if it is to provide the requisite mission support services necessary to achieve the interoperability/integration goals outlined in Joint Vision 2010 for working in concert with allied and coalition forces. PIMS R&D funding will also be critical to the development of system enhancements necessary to support the SecDef's proposal for building an improved PfP education and training framework. The plan envisions a lead role for PIMS to provide research, development, and specialized engineering services in support of a distributed education environment via a Consortium of Defense Academies and Security Institutes; an exercise simulation network; and a cooperative network of nationally sponsored PfP training centers. Other senior DOD directed PIMS initiatives include an electronic crisis information exchange capability among the countries of Southeastern Europe. Growth of this subregional network is contingent upon PIMS IT developmental efforts necessary to support a successful multinational crisis response and infrastructure repair coordination tool. Finally, R&D dollars must be made available for PIMS technical developmental efforts associated the Defense Information Infrastructure and conformance with the Clinger-Cohen Act.</p>										

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Exhibit R-2, RDT&E Budget Item Justification

Date: January 2000

Program Plans

- Database development in support of OSD and Joint Staff policy objectives tailored to PfP mission enhancement (i.e. Peacekeeping, Emergency Planning, Professional Military Education, and Exercises) -. (\$1.0 million)
- Research, testing, evaluation, and integration of AIS security guards, filters, and firewalls to enhance bilateral and NATO interoperability, and technologies to support incorporation of the Defense Message System and other C3I, J-6, and DISA policy-driven improvements to the Defense Information Infrastructure. (\$0.5 million)
- System enhancements which leverage new communications technologies, devices, and software to maximize PIMS accessibility, flexibility, and utility in support of increased US DOD processing requirements for preparedness in coalition operations (simulation, tools, exercise support, and interactive training). (\$0.5 million)

Specific Application and Process Improvements represent specific types of program and system improvements which will directly support development of OSD databases, interoperability initiatives, and communications enhancements. In addition, funds will provide directly support to the PIMS Program Office in implementing the multiple facets of the PIMS program for both US and Partners.

B. Program Change Summary:

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
FY 2000 President's Budget			
FY 2000 Appropriated Value			
Adjustment to Appropriated Value			
Inflation Adjustment			
FY 2001 Budget Estimate Submission	-	1,932	1,922

Change Summary Explanation

US Policy has put increased emphasis on DOD development of information capabilities that will serve not only coalition efforts in military operations but that will support non-traditional arenas such as Civil Emergency Planning. Additionally, enhanced technical and procedural interoperability among US organizations, PfP nations, and allies remains a high priority.

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Exhibit R-2, RDT&E Budget Item Justification

Date: January 2000

C. Other Program Funding Summary

	<u>FY 99</u>	<u>FY 00</u>	<u>FY 01</u>	<u>FY 02</u>	<u>FY 03</u>	<u>FY 04</u>	<u>FY 05</u>	<u>FY 06</u>	<u>To Complete</u>	<u>Total Cost</u>
O&M (PIF)									TBD	TBD
O&M (PIF - PIMS)	5.0	5.0							Continuing	
Total PIF									TBD	TBD

D. Acquisition Strategy:

PIMS employs an evolutionary acquisition strategy by establishing a well-defined core capability while planning for incremental upgrades and enhancements to the overall system capabilities. Each enhancement is treated as an individual acquisition; its scope and content the result of continuous feedback from PIMS users, supporting organizations, and the desired application of new technology balanced against the constraints of time and cost. Whenever possible, existing assets are leveraged to preserve US IT infrastructure investments and offer an economically prudent solution to increase mission effectiveness across the spectrum of PIMS participants.

E. Schedule Profile

Per developmental milestones listed below.

Quarter	<u>FY 2001</u>				<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>				<u>FY 2005</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestone I	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
II		x	x		x	x														
III		x	x		x	x														
IV		x	x		x	x	x	x	x	x										
V			x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
VI					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
VII						x	x		x	x	x	x	x	x	x	x	x	x	x	x
VIII							x		x	x	x	x	x	x	x	x	x	x	x	x

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Exhibit R-2, RDT&E Budget Item Justification

Date: January 2000

I Database Development – *R&D support to multiple DOD international outreach initiatives, i.e. OSD/SOLIC (Peacekeeping), OSD/Policy (Environmental Security), Joint Staff (Exercise Planning and Professional Military Education (NDU)), OSD/Health Affairs (Medical Education), OSD/ISA (Distance Learning Initiatives), DUSA-IA (Civil-Military Emergency Planning)*

Identify information requirements, common formats and exchange mechanisms between, PfP, NATO, and US
Develop databases and support mechanisms to allow collaborative data warehousing and sharing by relevant participants
Test and execute solutions in exercise environment
Upgrade/modify warehousing and data mining techniques
Continued development of databases supporting US requirements
Development of transitional approaches to other CINCS

II Enhanced Network and System Management

Evaluate network management tools
Test in operational configuration and evaluate results
Implement Solution
Develop diagnostic tools for IT and systemic measurement

III Mandated System Migration

Identify appropriate segments
Continued migration of PIMS servers to DII-compliant Architecture
Develop and tailor GCCS releasable applications to PfP mission requirements

IV Alternative Commercial Satellite Solutions

Research video compression techniques and other state of the art IT communication enhancements
Test in operational environment
Implement initial solution
Enhance video capability

V Defense Messaging System (DMS) Integration

Evaluate requirement for implementation across constrained bandwidth architecture
Initiate for test and evaluation
PIMS modification/enhancement

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Exhibit R-2, RDT&E Budget Item Justification	Date: January 2000
<p>Full implementation of DMS</p> <p>VI Expansion of Long Haul/Wide Area Communications Infrastructure Assess current network capacity and new requirements Design, engineer, and test necessary upgrades Implement expanded, improved architecture Continued evaluation of new technologies to enhance cost avoidance</p> <p>VII Theater Interoperability Evaluate interface requirements with existing target Theater and NATO systems Develop required interface Evaluate and test security guards, filters, and firewalls Implement</p> <p>VIII Voice Systems Identify voice over TCP/IP network solutions Test and select most efficient process Implement enhanced connectivity. Research customer and mission driven security options.</p>	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)					February 2000				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX			CENTRAL TEST AND EVALUATION INVESTMENT PROGRAM (CTEIP) PE 0604940D8Z						
\$'s in Millions	FY 1999*	FY 2000*	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	COST TO COMPLETE	TOTAL COST
PE 0604940D	131.669	132.866	121.401	116.642	125.719	128.243	130.733	Continuing	Continuing

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

***FY 1999 and FY 2000 funding for CTEIP was budgeted in the Director Test and Evaluation, Defense appropriation (TI 0450).**

On June 7, 1999, Secretary Cohen approved the disestablishment of the office of the Director, Test, Systems Engineering and Evaluation. In order to strengthen the role of the Director, Operational Test and Evaluation (D,OT&E) and consequently test and evaluation in OSD, the CTEIP mission will be consolidated under the D,OT&E.

As a result, CTEIP funding is now budgeted in the DOT&E appropriation (0460) beginning in FY 2001.

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

The JIM projects fund critically needed test and evaluation investments in the major functional areas of test mission command, control, communications and instrumentation; electronic warfare systems; threat and computational simulation test and evaluation; space systems T&E; weapons effects test capabilities; targets; and physical and environmental test capabilities. The investments include both the demonstrations of advanced technologies needed to test increasingly complex and sophisticated weapon systems and the transition of these technologies into test

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capabilities. Examples of project subject matter include: automated data collection, processing, display and archiving; smart munitions testing; modeling and simulation; advanced electronic combat systems; low-observable technologies and signature measurements; targets and target control; time-space-position-indication; end-game measurement; testing of advanced materials application; test design; and advanced sensors and space systems. CTEIP continues as the focal point for fostering common architectures throughout the test and training communities to enhance the sharing of resources and links between test and training ranges. CTEIP has provided special focus to institutionalize the use of modeling and simulation as practical test methods; to link ranges through internetting to enhance inter-range and inter-Service cooperation and resource sharing; and, to ensure development and acquisition of common instrumentation necessary for a more efficient test infrastructure. These efforts directly support the Department's initiative to improve the effectiveness of the Simulation, Test and Evaluation Process (STEP). Test Capabilities Benefit Analyses are conducted for each investment project to validate T&E requirements, to define integrated support systems, and to determine overall cost effectiveness of the proposed test investments. The use of DoD-wide criteria for requirement validation, prioritization, and risk assessment ensures an effective test resource investment program.

The REP funds development of near-term solutions for critical ongoing operational tests supporting decisions on major, high priority defense acquisition programs. The requirements for these solutions and test assets are generally not known more than two years in advance of a critical test requirement, and as such, are not programmable within the normal planning and budgeting process. These unanticipated OT capability requirements arise from several sources such as a new threat system identified during OT planning, unexpectedly acquiring foreign military assets critical in determining weapon system operational effectiveness, short timelines between system design maturity and scheduled OT, and emerging test requirements resulting from operational concept changes or system of systems testing. Funding these activities under the CTEIP provides the opportunity to coordinate and integrate these near-term test requirements with the total DoD test and evaluation investment planning, and ensures their availability and legacy for other programs that may have similar testing requirements.

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

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1999 Accomplishments:

JIM Projects:

- Initiated engineering and manufacturing development phase of the Hardened Sub-miniature Telemetry and Sensor System Project.
- Initiated engineering and manufacturing development phase of the High Speed Massive Memory Project.
- Initiated concept development and preparation of the Test Capabilities Benefit Analysis for the Land and Sea Vulnerability Test Capability Project to provide an instrumented land-sea interface test location at the Aberdeen Test Center.

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- Initiated concept development and preparation of the Test Capabilities Benefit Analysis for the BIG CROW EW Enhancement Project to upgrade and modernize high power amplifiers, antennas, communications and data systems for the BIG CROW high power stand off jamming capability.
- Initiated and completed the design for a heavy-duty roadway simulator.
- Initiated the concept development phase for the Electromagnetic Transient (EMT) Test and Evaluation Facility (EMTTEF) Project to provide a capability to assess aircraft hardness to EMT environments to meet MILSTD 464 requirements.
- Initiated the engineering and manufacturing development phase of the Tri-Service Target Signature Measurement and Database System Project.
- Initiated concept development and risk reduction efforts for the Joint Modeling and Simulation System Project to provide interoperability among the Services' model and simulations.
- Continued development, fabrication and test of Transportable Range Augmentation Control System Project.
- Continued to develop an integrated range architecture for range interoperability and preparation for a demonstration using High Level Architecture computer language within the Foundation Initiatives 2010 Project.
- Continued the concept development phase of the Advanced Mobile Object Acquisition System (AMOAS) Project to provide the next generation multi-target acquisition system.
- Continued development of the Joint Installed System Test Facility instrumentation capability including:
 - Continued development of the Multi-Spectral Scene Generator;
 - Completed the Joint Data Link Simulator and continued hardware and software design for Joint Communications Simulator within the Communication, Navigation, Identification Simulator;
 - Continued fabrication and test of prototype Generic Radar Target Generator; and
 - Continued development of the Infrared Sensor Stimulator.
- Continued the concept development phase of the Multi-Service Target Control System (MSTCS) Project.
- Continued concept development of commercial upgrade of the Holloman High Speed Sled Track.
- Continued concept development of the Airborne Icing Project.
- Continued Test Technology Development and Demonstration Project.
- Continued Tri-Service and CTEIP support projects.
- Continued the Advanced Radar Cross Section Measurement System Project.
- Achieved FOC for the Plume Measurement Capability Project.
- Achieved IOC of the Translated GPS Range System capability.
- Transferred the responsibility for threat system simulator development efforts from the Developmental Test and Evaluation program element into the Threat System Simulator Development Project within the CTEIP program element to reduce potential duplication in threat and target modeling and validation efforts.
- Completed concept development of the Target Modeling and Simulation Project.
- Completed the development of high resolution, color capable camera and the low rate initial production for the starter kit camera sets within the Airborne Separation Video Project.
- Completed the concept development phase for the Electromagnetic Environmental Effects Generating System Project.

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- Completed the concept development phase effort for the Joint Advanced Missile Instrumentation Project.
- Completed concept development/initiated engineering and manufacturing development phase for the Advanced Range Telemetry Project.

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Resource Enhancement Projects:

- Initiated the Dismounted Troop Instrumentation (DMT) subproject which reduces the size and weight of instrumentation required for Land Warrior testing.
- Initiated the Weapons Analysis Facility Enhancement (WAFER) subproject to develop threat submarine, surface combatant and surface launch torpedo models, complete model interfaces with new high speed computing hardware and Verify and Validate upgraded environmental, CM and threat target models.
- Initiated the Radio Frequency Phase Distribution Upgrade (RF PDU) subproject which procures Advanced Tactical Electronic Warfare Environment Simulator (ATEWES) Microwave Phase Distribution (MDS) hardware and develops software subsystems to meet EA-6B Improved Capability (ICAP) III LR-700 receiver upgrade and planned follow-on interferometer receiver systems test.
- Initiated the Missile Warning Test Capability (MWTC) subproject to support F-16 Common Missile Warning System testing.
- Initiated the QF-4 IR Characterization (IR CHAR) subproject to provide predictive codes and models of the infrared (IR) and ultraviolet (UV) characteristics of the QF-4 (DoD Full-Scale Aerial Target) to support AIM-9X testing.
- Initiated the Joint OT&E Simulation Environment Facility (JOSEF) subproject which provides a representative warfare/contingency operations environment for OT&E of network centric C4I systems such as the Defense Message System and the Global Command and Control System.
- Initiated the Reconfigurable Electro-Optical and Magnetic Expendable Target (REMET) subproject which will provide an expendable, electro-optical and magnetic signature replicate of the T-80 tank for use in Predator testing.
- Continued the Test Resource, Analysis, and Planning task to identify near-term OT shortfalls and validate the requirement for test capability.
- Continued to identify candidate subprojects based on critical OT&E test capability shortfalls.
- Completed the Suite of Integrated Infrared Counter Measures/Common Missile Warning System (SIIRCM/CMWS) Test Instrumentation Project to support MH-60K and EH-60K Suite of Integrated Infrared Counter Measures testing.
- Completed the Simulation Testing Operations Rehearsal Model sub-project, which provides a battlefield environment for brigade and below C4I and tactical internet operational testing in support of Force XXI Battle Command Brigade and Below system testing.
- Completed the Advanced Missile Instrumentation Package sub-project which provides a capability to accurately track a missile throughout the flight including the high kinematics environment portion of the flight envelope to support Suite of Integrated Infrared Counter Measures and Common Missile Warning System testing.
- Completed the XM-43A sub-project to instrument a threat weapon system to support Suite of Integrated Radio Frequency Countermeasures testing.
- Completed the Ultraviolet Stimulator sub-project, which provides an open-air test capability for aircraft missile-warning systems in support of AV-8B (Common Missile Warning System Integration) and F/A-18 E/F Common Missile Warning System / Integrated Defensive Electronic Countermeasures integration testing.
- Completed the Integrated Defensive Electronic Countermeasures (IDECM) Test Resources sub-project to develop a semi-active missile simulation capability for ECM testing of the IDECM integration into the F/A-18 E/F.
- Completed the Realistic Operational Communications Scenarios (ROCS) sub-project to provide the capability to evaluate the performance of the Tactical Data Network and other Marine Air-to-Ground Task Force C4I systems.

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- Completed the Laser Observation Test and Evaluation Capability (LOTEC) subproject to provide a capability to verify the location of laser target designation data and correlate with fire control information during testing of the Lightweight Laser Designator Rangefinder and the Marine Corps' Tactical Laser Designator Handoff System.
- Completed the Utah Test and Training Range Precision Guided Munitions sub-project to provide the extension to the TS-4 Target Complex to support Joint Direct Attack Munitions, Joint Stand-off Weapon and B-1B Conventional Munitions Upgrade Program testing.
- Completed the Advanced Threat Instrumentation sub-project to instrument threat aircraft to provide real-time flight data into the range data and control infrastructure to support tests of the Joint Helmet Mounted Cueing System.

FY 2000 Accomplishments:

JIM Projects:

- Initiate the engineering and manufacturing development phase for the Electromagnetic Environmental Effects Generating System Project.
- Initiate the engineering and manufacturing development phase for the Joint Advanced Missile Instrumentation Project.
- Initiate the engineering and manufacturing development phase of the Multi-Service Target Control System (MSTCS).
- Initiate the DECADE Radiation Test facility Enhancement Project to develop and field an upgraded, above ground ionizing radiation test capability to meet existing and emerging nuclear weapons effects test requirements.
- Initiate concept development phase of GPS Signal Validation Project.
- Initiate concept development phase of AEDC Instrumentation Project.
- Complete design of the Roadway Simulator.
- Identify requirements and develop program planning for Magdalena Ridge Observatory.
- Continue to develop an integrated range architecture for range interoperability within the Foundation Initiatives 2010 Project.
- Continue engineering and manufacturing development phase of the Hardened Sub-miniature Telemetry and Sensor System Project.
- Continue the conventional Holloman High Speed Sled Track upgrade.
- Continue engineering and manufacturing development for the Advanced Range Telemetry Project.
- Continue threat system simulator development efforts under the Threat System Simulator Development Project to improve integration and reduce potential duplication in threat and target modeling and validation efforts.
- Continue Test Technology Development and Demonstration Project.
- Continue Tri-Service and CTEIP support projects.
- Achieve IOC for the Transportable Range Augmentation Control System Project capability.
- Achieve FOC for the High Speed Massive Memory capability.
- Achieve FOC and completion of the Translated GPS Range System Project.
- Complete development of Long-Term Test Capability (LTTC) camera and Multi-System Controller (MSC) for Airborne Separation Video project.

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- Complete the concept development phase of the Advanced Mobile Object Acquisition System (AMOAS) Project to include an automatic radar mode management and power allocation control capability to provide the next generation multi-target acquisition system.
- Complete the concept development and the Test Capabilities Benefit Analysis for the Land and Sea Vulnerability Test Capability Project.
- Complete the concept development and the Test Capabilities Benefit Analysis for the BIG CROW EW Enhancement Project.
- Complete the Multi-Spectral Scene Generator and the Infrared Sensor Stimulator instrumentation and continue efforts on the Communication, Navigation, Identification Simulator and the Generic Radar Target Generator instrumentation within the Joint Installed System Test Facility Project.
- Continue the concept development phase for the Electromagnetic Transient (EMT) Test and Evaluation Facility (EMTTEF) Project to provide a capability to assess aircraft hardness to EMT environments to meet MILSTD 464 requirements.
- Complete the Air-to-Air Signature Measurement System (AASMS), continue development of the Acoustic Signature Measurement and Unaugmented Tracking System (ASMUTS), and initiate the Air-to-Ground and Ground Signature Measurement Systems (AGSMS and GSMS) within the Tri-Service Target Signature Measurement and Database System Project.
- Initiate engineering and manufacturing development of the Airborne Icing Project.
- Achieve FOC for the Advanced Static RCS Measurement Project.
- Complete concept development and initiate engineering and manufacturing development for the Joint Modeling and Simulation System Project to provide interoperability among the Services' model and simulations.

Resource Enhancement Projects:

- Initiate Geometric Automated Video Enhanced Location System subproject to locate events / detonations needed to answer accuracy critical operational issues (COIs) for Army field artillery systems, Army airborne systems, and Marine non-lethal weapon systems.
- Initiate TAMD Interoperability Assessment Capability subproject to support PAC 3 and TAMD Family of Systems operational testing.
- Initiate Shallow Water ASW Target subproject to modify an existing, manned diesel-electric research submarine for use as an Anti-Submarine Warfare (ASW) target to support MK-54 and MK-48 ADCAP torpedo testing.
- Initiate Real-Time SAM Models for OT&E subproject to develop real-time surface-to-air (RTSAM) models to be used in virtual simulations being developed for the F-22 and JSF Test and Evaluation programs.
- Initiate Geometric Pairing subproject to design and develop a geometric pairing (pointing) device to be used with Air Defense weapons against aircraft during Comanche operational test.
- Initiate Instrumentation of the IBIS Hammer System for use in IDECM RFCM and IDECM Integration testing.
- Initiate the Electronic Order of Battle – Environment Generator System subproject to develop computer-driven simulations replicating selectable threat and friendly electronic environments for operational testing of the Team Portable Collection System (TPCS), the Mobile Electronic Warfare Support System (MEWSS), and the Technical Control and Analysis Center (TCAC).
- Continue Test Resource, Analysis, and Planning task to identify near-term OT shortfalls and validate the requirement for test capability.
- Continue to identify candidate subprojects based on critical OT&E test capability shortfalls.

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- Continue the Weapons Analysis Facility Enhancement Resource (WAFER) subproject to develop threat submarine, surface combatant and surface launch torpedo models, complete model interfaces with new high speed computing hardware and Verify and Validate upgraded environmental, CM and threat target models.
- Continue the Radio Frequency Phase Distribution Upgrade (RF PDU) subproject which procures Advanced Tactical Electronic Warfare Environment Simulator (ATEWES) Microwave Phase Distribution (MDS) hardware and develops software subsystems to meet EA-6B Improved Capability (ICAP) III LR-700 receiver upgrade and planned follow-on interferometer receiver systems test.
- Continue the Joint OT&E Simulation Environment Facility (JOSEF) subproject.
- Complete the Reconfigurable Electro-Optical and Magnetic Expendable Target (REMET) subproject which will provide an expendable, electro-optical and magnetic signature replicate of the T-80 tank for use in Predator testing.
- Complete the QF-4 IR Characterization (IR CHAR) subproject to provide predictive codes and models of the infrared (IR) and ultraviolet (UV) characteristics of the QF-4 (DoD Full-Scale Aerial Target) to support AIM-9X testing.
- Complete the Missile Warning Test Capability (MWTC) subproject and support F-16 Common Missile Warning System testing.
- Complete the Dismounted Troop Instrumentation (DMT) subproject which reduces the size and weight of instrumentation required for Land Warrior testing.

FY 2001 Plans:

JIM Projects:

- Initiate the engineering and manufacturing development phase of the Advanced Mobile Object Acquisition System (AMOS) Project to provide the next generation multi-target acquisition system.
- Initiate the engineering and manufacturing development phase for the Land and Sea Vulnerability Test capability Project to provide an instrumented land-sea interface test location at the Aberdeen Test Center.
- Initiate the engineering and manufacturing development phase for the BIG CROW EW Enhancement Project to upgrade and modernize high power amplifiers, antennas, communications and data systems for the BIG CROW high power stand off jamming capability.
- Initiate the engineering and manufacturing development phase for the Electromagnetic Transient (EMT) Test and Evaluation Facility (EMTTEF) Project to provide a capability to assess aircraft hardness to EMT environments to meet MILSTD 464 requirements.
- Initiate the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) System Project to develop a capability to test increasingly complex multi-discipline fusion concepts.
- Continue to develop an integrated range architecture for range interoperability within the Foundation Initiatives 2010 Project.
- Continue engineering and manufacturing development phase of the Hardened Sub-miniature Telemetry and Sensor System Project.
- Continue the Electromagnetic Environmental Effects Generating System Project.
- Continue the Joint Advanced Missile Instrumentation Project.
- Continue development of the Multi-Service Target Control System (MSTCS) Project. This project builds on the usable design, hardware and software available from the canceled Next Generation Target Control System Project.

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- Continue the Holloman High Speed Sled Track conventional upgrade.
- Continue development of the Advanced Range Telemetry Project.
- Continue development of the Joint Modeling and Simulation System Project to provide interoperability among the Services' model and simulations.
- Continue development of the Airborne Icing Project.
- Continue threat system simulator development efforts under the Threat System Simulator Development Project to improve integration and reduce potential duplication in threat and target modeling and validation efforts.
- Continue Test Technology Development and Demonstration Project.
- Continue Tri-Service and CTEIP support projects.
- Achieve FOC for the Transportable Range Augmentation Control System Project capability.
- Complete the Communication, Navigation, Identification Simulator and the Generic Radar Target Generator instrumentation projects within the Joint Installed System Test Facility Project.
- Complete Acoustic Signature Measurement and Unaugmented Tracking System (ASMUTS) and continue the Air-to-Ground and Ground Signature Measurement Systems (AGSMS and GSMS) developments within the Tri-Service Target Signature Measurement and Database System Project.
- Complete the concept development and initiate engineering and manufacturing development for the DECADE Radiation Test facility Enhancement Project to develop and field an upgraded, above ground ionizing radiation test capability to meet existing and emerging nuclear weapons effects test requirements.
- Complete concept development phase of GPS Signal Validation Project.
- Complete concept development phase of AEDC Instrumentation Project.

Resource Enhancement Projects:

- Continue to identify candidate subprojects based on critical OT&E test capability shortfalls.
- Continue Geometric Automated Video Enhanced Location System subproject to locate events / detonations needed to answer accuracy critical operational issues (COIs) for Army field artillery systems, Army airborne systems, and Marine non-lethal weapon systems.
- Complete TAMD Interoperability Assessment Capability subproject to support PAC 3 and TAMD Family of Systems operational testing.
- Continue Shallow Water ASW Target subproject to modify an existing, manned diesel-electric research submarine for use as an Anti Submarine Warfare (ASW) target to support Mk54 and Mk 48 ADCAP torpedo testing.
- Complete Real Time SAM Models for OT&E subproject to develop real-time surface-to-air (RTSAM) models to be used in virtual simulations being developed for the F-22 and JSF Test and Evaluation programs.
- Complete Geometric Pairing subproject to design and develop a geometric pairing (pointing) device to be used with Air Defense weapons against aircraft during Comanche operational test.
- Complete Instrumentation of the IBIS Hammer System for use in IDECM RFCM and IDECM Integration testing.

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- Complete the Electronic Order of Battle – Environment Generator System subproject to develop computer-driven simulations replicating selectable threat and friendly electronic environments for operational testing of the Team Portable Collection System (TPCS), the Mobile Electronic Warfare Support System (MEWSS), and the Technical Control and Analysis Center (TCAC).
- Complete Joint OTE Simulation Environment Facility subproject which provides a representative warfare / contingency operations environment for OT&E of network centric C4I systems such as the Defense Message System and Global Command and Control System.
- Complete Weapons Analysis Facility Enhancement subproject to develop threat submarine, surface combatant and surface launched torpedo models, complete model interfaces with new high speed computing hardware and verify and validate upgraded environmental, countermeasure and threat target models.
- Complete the Radio Frequency Phase Distribution Upgrade (RF PDU) subproject which procures Advanced Tactical Electronic Warfare Simulator (ATEWES) Microwave Phase Distribution (MDS) hardware and develops software subsystems to meet EA-6B Improved Capability (ICAP) III LR-700 receiver upgrade and planned follow-on interferometer receiver systems test.

(U) PROGRAM CHANGE SUMMARY

(\$ in Millions)	<u>FY 1999*</u>	<u>FY 2000*</u>	<u>FY 2001</u>
FY 2000 President’s Budget	131.669	121.741	121.943
Resource Enhancement Program (Congressional Reduction)		(5.000)	
Roadway Simulator		10.000	
Airborne Separation Video System		4.000	
Magdalena Ridge Observatory		3.500	
Appropriated Value	131.669	134.241	
Adjustments to Appropriated Value			
Government-wide Rescission		(1.375)	
Nonpay Purchase Inflation Adjustment			(542)
Current Budget Submit	131.699	132.866	121.401

C. (U) OTHER PROGRAM FUNDING NA

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)					February 2000				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX			OPERATIONAL TEST AND EVALUATION PE 0605118D8Z						
\$'s in Millions	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	COST TO COMPLETE	TOTAL COST
PE 0604940D	28.211	14.602	17.172	17.379	17.542	17.791	18.097	Continuing	Continuing

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

The Director of Operational Test and Evaluation (DOT&E) is responsible for policy and procedures for all aspects of operational test and evaluation within the Department of Defense (DoD), with particular focus on OT&E that supports major weapon system production decisions. Currently there are approximately 200 Major Defense Acquisition Programs (MDAPs) on the DOT&E oversight list. These MDAPs may not proceed beyond low-rate initial production (LRIP) until operational test and evaluation of the program is completed. This requires early involvement by DOT&E in the planning phase of each program to ensure adequate testing and satisfactory progress through the acquisition milestones toward operational effectiveness, suitability goals and full-scale production. Key elements of the DOT&E's authority for MDAPs include: the approval of Service Test and Evaluation Master Plans (TEMPs) and Service operational test and evaluation (OT&E) plans; assessment of the adequacy of OT&E and the operational effectiveness and suitability of the weapon system; and participation in DoD-wide planning, programming and budgeting activities to highlight test and evaluation capabilities, needs and priorities.

DOT&E also has statutory responsibility for oversight of the Live Fire Test and Evaluation Program within DoD which is budgeted for under Program Element 0605131D8Z. The funding shown in this exhibit, as management support of research and development, is budgeted for in Program Element Research Category 6.5.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1999 Accomplishments:

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•Reviewed Service TEMPs and test plans and provided appropriate guidance to ensure test adequacy; observed preparation for, and conduct of, field operational tests; evaluated OT results and reported evaluations to Congress and DoD senior management; and conducted assessments on programs to include evaluation of projected resource requirements and funding levels for OT&E. Programs that benefited from this oversight service included: (Amounts funded shown.)

Land Warfare Programs (\$3.214M)

Abrams Tank (M1A2) System Enhancement Program (SEP)
Army Tactical Missile System Brilliant Anti-Armor Submunition (ATACMS/BAT)
ATACMS-BAT/Pre-Planned Product Improvement (P3I)
Biological-Chemical Programs (Detection/Protection/Decontamination/C41)
Bradley Fighting Vehicle System (BFVS) -A3/M2A3 and M3A3 Program
Chinook (CH-47) Improved Cargo Helicopter (ICH)
Close Combat Tactical Trainer (CCTT)
Comanche RAH-66
CRUSADER Howitzer & Resupply Vehicle
Enhanced Fiber Optic Guided Missile (EFOG-M)
Family of Medium Tactical Vehicles (FMTV)
Follow-on-TOW Missile System (FOTT)
High Mobility Multi-Purpose Light Tactical Vehicle (HMMLTV)
Improved Target Acquisition System (ITAS)
Javelin Advanced Anti-Tank Weapon System
Joint Distribution System (JDS)
Joint Modular Lighting System
Joint Surveillance Target Attack Radar System
(JSTARS) Common Ground Station (CGS)
Kiowa Warrior (OH-58D)
Land Warrior
Line of Sight Anti-Tank (LOSAT) Weapon System
Longbow Hellfire Missile System
Multiple Launched Rocket System Upgrade (MLRS Upgrade)
Sense and Destroy Armor (SADARM)
Stinger Reprogrammable Microprocessor II (RMP II)
Tactical Unmanned Aerial Vehicle (UAV) --Outrider

Naval Warfare Programs (\$2.063M)

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Advanced Amphibious Assault Vehicle (AAAV)
Advanced Combat Direction System (ACDS) Block I
Advanced Integrated Electronic Warfare System (AIEWS)
Aegis SPY Radar (AN/SPY-1B/D/D(V))
AN/SQQ-89 Antisubmarine Warfare Combat System
Auxiliary Dry Cargo Carrier (T-ADC(X))
CH-60S Fleet Combat Support Helicopter
Cooperative Engagement Capability (CEC)
DD21 Land Attack Destroyer
DDG-51 Arleigh Burke Class Destroyer
Evolved Sea Sparrow Missile (ESSM)
Fixed Distributive System (FDS) and
 Advanced Deployable System (ADS)
Future Sea-Based Tactical Aviation Platform (CV/X)
LPD-17 Amphibious Assault Ship
MK-48 Advanced Capability (ADCAP) Torpedo
MHC51 Coastal Mine Hunter
Virginia (SSN 774) Class Submarine
Rolling Airframe Missile (RAM)
Seawolf Class Nuclear Attack Submarine/Combat System (SSN-21/BSY-2)
SH-60R Multi-Mission Helicopter Program
Ship Self-Defense System (SSDS)
Standard Missile-2 Blocks IIIB, IV, and IVA
Strategic Sealift Ship (SSP)
Submarine External Communications System (SubECS)
TAGOS/SURTASS Surveillance Ship/Low Frequency Active (LFA) Sonar

Air Warfare Programs (\$2.755M)

Advanced Medium Range Air-to Air (AMRAAM)
AH-1 and UH-1 Helicopter Upgrades (4BN/4BW Upgrade)
AIM-9X Missile
C-130 Aircraft Modernization Program (AMP)
C-130J All Variants (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
C-17 Airlift Aircraft
F/A-18 C/D Hornet

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F/A-18 E/F Hornet
F-22 Air Superiority Fighter
Global Hawk High Altitude Endurance UAV
Joint Air-to-Surface Strike Missile (JASSM)
Joint Direct Attack Munition (JDAM)
Joint Primary Aircraft Training System (JPATS)
Joint Standoff Weapon (JSOW)
Joint Strike Fighter (JSF)
Joint Surveillance and Target Attack Radar System (JSTARS) E-8
Predator Medium Altitude Endurance UAV
Sensor Fused Weapon (SFW)
Standoff Land Attack Missile---Expanded Response (SLAM-ER)
T-45 Training System
Tactical Aviation Mission Planning System (TAMPS)
V-22 Osprey (Joint Vertical Airlift)

Electronic Warfare Programs (\$1.014M)

AAR-47 Upgrade
AN/ALR-56 (all versions) Radar Warning Receiver (RWR) -- all upgrades
AN/ALR-67 (all versions - includes AN/ALR-67[V]
3 Advanced Special Receiver)RWR -- all upgrades
AN/ALR-67E (V)2 RWR upgrade
AN/ALR-69 (all versions) RWR -- all upgrades
AN/APR-39 (all versions) RWR -- all upgrades
B-1B Bomber Defensive System Upgrade Program (DSUP)
"EA-6B ""Prowler"" (includes AN/ALQ-99 Tactical Jamming
System and AN/USQ-113 Communications Jammer) -- all upgrades"
EA-6B Prowler:
Band 7/8 Jammer
Band 9/10 Jammer
Improved Capability (ICAP) III
Low Band Transmitter
Multi-mission Advanced Tactical Terminal/Integrated Data Modem (MATT/IDM)
USQ-113 Connectivity Suite
F-15 Tactical Electronic Warfare System (TEWS)

R-1 Shopping List – Item No 2- 4 of 19

Exhibit R-2, RDT&E Budget Item Justification

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including AN/ALQ-135 self-protection jammer -- all upgrades
Integrated Defensive Electronic Countermeasures (IDECM)
Integrated Defensive Electronic Countermeasures (IDECM) Block I Interim Suite (Airborne Self- Protection Jammer/ALE-50)
Suite of Integrated Infrared Countermeasures / Common
Missile Warning System (SIIRCM/CMWS)
Suite of Integrated Radio Frequency Countermeasures (SIRFC)
Surface-to-Air Missile (SAM)/Mobile Missile Launcher

Command, Control, Communications, and Intelligence Programs (\$3.792M)

All Source Analysis System (ASAS)
Army Global Command and Control System (AGCCS)
Army Tactical Command and Control System (ATCCS) Capstone
Battlefield Digitization
C2 Vehicle
Cheyenne Mountain Upgrade
Combat ID
Combat Survivor Evader Location (CSEL) System
Composite Health Care System (CHCS II)
Defense Civilian Personnel Data System (DCPDS)
Defense Medical Logistics Standard Support (DMLSS)
Defense Message System (DMS)
Distribution Standard System (DSS)
E-2C Hawkeye Airborne Early Warning
E-3A Airborne Warning and Control System
(AWACS) Radar System Improvement Program (RSIP)
E-6A TACAMO (multiple subprograms)
F-15 Fighter Data Link
Forward Area Air Defense System (FAADS) C3I
Global Transportation Network (GTN)
High Performance Computing Modification Plan (HPCMP)
Integrated Maintenance Data System (IMDS)
Joint Computer Aided Acquisition and Logistic Support (JCALS)
Joint Receiving Information Support System
Joint Service Imagery Processing System (JSIPS)
Joint Tactical Information Distribution System (JTIDS)

R-1 Shopping List – Item No 2- 5 of 19

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Maneuver Control System (MCS)
MILSTAR Satellite Communications System
Multifunctional Information Distribution System (MIDS)
NAVASTAR GPS User Equipment (UE)
Navy Standard Integrated Personnel System (NSIPS)
Non-Tactical Command Support System (NTCSS)
Reserve Component Automation System (RCAS)
Standard Installation/Division Personnel System 3 (SIDPERS3)
Standard Procurement System (SPS)
Strategic War Planning System (SWPS)
Theater Medical Information Program (TMIP)

Strategic Warfare and Space Systems Programs (\$2.156M)

B1-B Lancer
B2 Advanced Technology Bomber
Evolved Expendable Launch Vehicle (EELV)
Medium Extended Air Defense System (MEADS)
National Airspace System (NAS)
National Missile Defense (NMD) System
Navy Theater Ballistic Missile Defense (TMBD)
Patriot P3I
Patriot Upgrade
Theater High Altitude Area Defense (THAAD)
TITAN IV Space Booster
Tomahawk Block IV / Theater Mission Planning Center (TMPC)

Other Systems

Chemical Demilitarization

Efforts Performed With Y2K Funding (\$12.9M)

Because of DOT&E's expertise in test planning and analysis, in September, 1998, the Deputy Secretary of Defense asked DOT&E to help the ten warfighting commanders-in-chief (CINCs) in conducting their year 2000 (Y2K) operational evaluations (OPEVALs). In conducting this task, DOT&E sought and received assistance from the four Military Service Operational Test Agencies (OTAs), the Joint Interoperability Test Center (JITC) of the Defense Information Systems Agency (DISA) as well as the Institute for Defense Analyses and Science Applications and International Corp (SAIC).

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Approximately 60 people from OTAs, JITC, IDA, and SAIC assisted all ten commands. DOT&E support brought rigor to the OPEVAL process. Most OPEVALs were very thorough and the DOT&E effort included support in test planning, training, rehearsals, execution, analysis, and reporting. The Joint Staff was very pleased with DOT&E's assistance to the CINCs.

Y2K OPEVALs have resulted in the decommissioning of several obsolete Command, Control, Communications, Computers, and Intelligence Surveillance and Reconnaissance (C4ISR) systems and on focusing on the mission critical systems. DOT&E is recommending that DoD consider institutionalizing the periodic conduct of C4ISR infrastructure OPEVALs, possibly once every three years. Such periodic OPEVALs would update CINCs' assessments of their ability to meet mission requirements, allow CINCs to verify interoperability for critical programs, and identify systems that could be eliminated.

Implementing the Quadrennial Defense Review (QDR) in Test and Evaluation: This program element was increased by \$2.5 million in FY 1999 by the DoD Program Decision Memorandum (PDM) issued in November, 1997, following the annual DoD Program Review. These funds will be needed by DOT&E for implementing the QDR in test and evaluation. The funding will be for additional technical and analytical support for evaluation of operational testing of (1) U.S. capabilities to deploy National Missile Defense (NMD), (2) new initiatives in Battlefield Digitization (BD), and (3) Chemical and Biological Warfare (CBW) defenses.

The Quadrennial Defense Review (QDR) declared that development of U.S. capabilities to deploy a National Missile Defense (NMD) is a national priority. The NMD program encompasses a new and critical mission area where the most advanced technology will need to function near-flawlessly. The non-traditional development and acquisition approach for NMD significantly increases the evaluation and analysis workload for DOT&E. This non-traditional approach and the number of new component systems to be developed for NMD will require a quantum increase in DOT&E evaluation and oversight responsibilities. That increased activity is needed to assure that each NMD component system satisfies its test objectives while delivering on schedule a capability to counter the anticipated threat. The new initiatives that comprise the Battlefield Digitization (BD) program support the Chairman of the Joint Chiefs of Staff's "Joint Vision 2010". BD is a massive multi-billion dollar command, control, communications and intelligence (C3I) program that directly impacts and affects how the entire Army fights. It will have extraordinary impact on every major dismounted, ground, and airborne platform in the Army's inventory. Using computer systems, BD is designed to integrate digital communications and information management technologies into all such platforms and systems. This will be accomplished using both existing and developmental computers and communications systems that will be expected to fully inter-operate and interface with each other across both tactical and strategic echelons and formations - all highly critical functions for the reliable and timely extension of command-and-control down to the lowest possible echelon. Consequently, the expected improvement via BD in situational awareness and the use of its communications-electronics to transmit and receive orders, plans, reports, and graphic overlay is expected to greatly increase the Army warfighter's abilities in the areas of force effectiveness, lethality, survivability, and operating tempo (OPTEMPO). Also, BD is an exceptionally complex and all-encompassing C3I program that the Army plans to incorporate in its First Digitized Division (FDD) in the year 2000 and, subsequently, field to all of its major formations soon after its fielding to the FDD. This makes it imperative that DOT&E be provided the resources required to ensure that necessary and adequate operational test and evaluation (OT&E) will be accomplished to support BD's very ambitious and complex acquisition strategy.

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The QDR identified Chemical and Biological Warfare (CBW) by potential adversaries, using unconventional approaches, as one of the key areas of future threat to U.S. military forces. U.S. forces must be properly equipped and trained to operate effectively and decisively in the face of CBW attacks. In pursuit of these goals, DoD has increased planned spending on CBW defense activities by approximately \$1 billion over the program period. To ensure that the systems developed by these programs are ready for use by our servicemen and servicewomen when they are fielded, DOT&E must play a key role in assuring that these systems are operationally effective and suitable. DOT&E's monitoring and assessment of the test and evaluation programs of each of these systems, as they are developed, will require extensive research into the current state of chemical and biological warfare agent detection and identification, with special emphasis on operational testing of this equipment by troops in the field---including tactics, techniques and procedures used by soldiers to operate, maintain and report the results of use of this equipment.

- Perform official travel to carry out oversight of DoD operational testing and evaluation. (\$.327M)

FY 2000 Accomplishments:

•Review Service TEMPs and test plans and provide appropriate guidance to ensure test adequacy; observe preparation for, and conduct of, field operational tests; evaluate OT results and report evaluations to Congress and DoD senior management; and conduct assessments on programs to include evaluation of projected resource requirements and funding levels for OT&E. Programs benefiting from this oversight service will include:

Land Warfare Programs (\$2.916M)

Abrams Tank (M1A2) System Enhancement Program (SEP)
Army Tactical Missile System Brilliant Anti-Armor Submunition (ATACMS/BAT)
ATACMS-BAT/Pre-Planned Product Improvement (P3I)
Biological-Chemical Programs (Detection/Protection/Decontamination/C41)
Bradley Fighting Vehicle System (BFVS) -A3/M2A3 and M3A3 Program
Chinook (CH-47) Improved Cargo Helicopter (ICH)
Close Combat Tactical Trainer (CCTT)
Comanche RAH-66
CRUSADER Howitzer & Resupply Vehicle
Family of Medium Tactical Vehicles (FMTV)
High Mobility Multi-Purpose Light Tactical Vehicle (HMMLTV)
Javelin Advanced Anti-Tank Weapon System
Joint Distribution System (JDS)
Joint Modular Lighting System
Joint Surveillance Target Attack Radar System

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(JSTARS) Common Ground Station (CGS)
Kiowa Warrior (OH-58D)
Land Warrior
Line of Sight Anti-Tank (LOSAT) Weapon System
Longbow Hellfire Missile System
Multiple Launched Rocket System (MLRS) Upgrade
Sense and Destroy Armor (SADARM)
Stinger Reprogrammable Microprocessor II (RMP II)
Tactical Unmanned Aerial Vehicle (UAV) --Outrider
UH-60 Black Hawk Service Life Extension Program (SLEP)

Naval Warfare Programs (\$1.541M)

Advanced Amphibious Assault Vehicle (AAAV)
Advanced Combat Direction System (ACDS) Block I
Advanced Integrated Electronic Warfare System (AIEWS)
Aegis SPY Radar (AN/SPY-1B/D/D(V))
Auxiliary Dry Cargo Carrier (T-ADC(X))
CH-60S Fleet Combat Support Helicopter
Cooperative Engagement Capability (CEC)
DD21 Land Attack Destroyer
DDG-51 Arleigh Burke Class Destroyer
Evolved Sea Sparrow Missile (ESSM)
Fixed Distributive System (FDS) and
Advanced Deployable System (ADS)
Future Sea-Based Tactical Aviation Platform (CV/X)
LPD-17 Amphibious Assault Ship
MK-48 Advanced Capability (ADCAP) Torpedo
Virginia (SSN 774) Class Submarine
Rolling Airframe Missile (RAM)
Seawolf Class Nuclear Attack Submarine/Combat System (SSN-21/BSY-2)
SH-60R Multi-Mission Helicopter Program
Ship Self-Defense System (SSDS)
Standard Missile (SM-2) Block IIIB and Block IV/IVA
Strategic Sealift Ship (SSP)
Submarine External Communications System (SubECS)

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TAGOS/SURTASS Surveillance Ship/Low Frequency Active (LFA) Sonar

Air Warfare Programs (\$2.268M)

Advanced Medium Range Air-to Air (AMRAAM)
AH-1 and UH-1 Helicopter Upgrades (4BN/4BW Upgrade)
AIM-9X Missile
AN/SQQ-89 Antisubmarine Warfare Combat System
C-130 Aircraft Modernization Program (AMP)
C-130J All Variants (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
C-17 Airlift Aircraft
F/A-18 C/D Hornet
F/A-18 E/F Hornet
F-22 Air Superiority Fighter
Global Hawk High Altitude Endurance UAV
Joint Air-to-Surface Strike Missile (JASSM)
Joint Direct Attack Munition (JDAM)
Joint Primary Aircraft Training System (JPATS)
Joint Standoff Weapon (JSOW)
Joint Strike Fighter (JSF)
Joint Surveillance and Target Attack Radar System (JSTARS) E-8
Predator Medium Altitude Endurance UAV
Sensor Fused Weapon (SFW)
Standoff Land Attack Missile---Expanded Response (SLAM-ER)
T-45 Training System
Tactical Aviation Mission Planning System (TAMPS)
V-22 Osprey (Joint Vertical Airlift)

Electronic Warfare Programs (\$1.210M)

AAR-47 Upgrade
AN/ALR-56 (all versions) RWR -- all upgrades
AN/ALR-67 (all versions - includes AN/ALR-67[V]
3 Advanced Special Receiver) RWR -- all upgrades
AN/ALR-67E (V)2 RWR upgrade
AN/ALR-69 (all versions) RWR -- all upgrades
AN/APR-39 (all versions) Radar Warning Receiver (RWR) -- all upgrades

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Exhibit R-2, RDT&E Budget Item Justification

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B-1B Bomber Defensive System Upgrade Program (DSUP)

EA-6B Analysis of Alternatives (AoA) Follow-on

"EA-6B ""Prowler"" (includes AN/ALQ-99 Tactical Jamming System and AN/USQ-113 Communications Jammer) -- all upgrades"

EA-6B:

- Band 7/8 Jammer

- Band 9/10 Jammer

- Improved Capability (ICAP) III

- Low Band Transmitter

- Multi-mission Advanced Tactical Terminal/Integrated Data Modem (MATT/IDM)

- USQ-113 Connectivity Suite

F-15 Tactical Electronic Warfare System (TEWS) including

- AN/ALQ-135 self-protection jammer -- all upgrades

Integrated Defensive Electronic Countermeasures (IDECM)

Integrated Defensive Electronic Countermeasures (IDECM) Block I Interim Suite (Airborne Self- Protection Jammer/ALE-50)

Suite of Integrated Infrared Countermeasures / Common Missile Warning System (SIIRCM/CMWS)

Suite of Integrated Radio Frequency Countermeasures (SIRFC)

Command, Control, Communications, and Intelligence Programs (\$4.095M)

- All Source Analysis System (ASAS)

- Army Global Command and Control System (AGCCS)

- Army Tactical Command and Control System (ATCCS) Capstone

- Battlefield Digitization

- C2 Vehicle

- Cheyenne Mountain Upgrade

- Combat ID

- Combat Survivor Evader Location (CSEL) System

- Composite Health Care System (CHCS II)

- Defense Civilian Personnel Data System (DCPDS)

- Defense Medical Logistics Standard Support (DMLSS)

- Defense Message System (DMS)

- Distribution Standard System (DSS)

- E-2C Hawkeye Airborne Early Warning

- E-3A Airborne Warning and Control System (AWACS)

 - Radar System Improvement Program (RSIP)

- E-6A TACAMO (multiple subprograms)

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F-15 Fighter Data Link
Forward Area Air Defense System (FAADS) C3I
Global Transportation Network (GTN)
High Performance Computing Modification Plan (HPCMP)
Integrated Maintenance Data System (IMDS)
Joint Computer Aided Acquisition and Logistics Support (JCALS)
Joint Receiving Information Support System
Joint Service Imagery Processing System (JSIPS)
Joint Tactical Information Distribution System (JTIDS)
Maneuver Control System (MCS)
MILSTAR Satellite Communications System
Multifunctional Information Distribution System (MIDS)
NAVASTAR GPS User Equipment (UE)
Navy Standard Integrated Personnel System (NSIPS)
Non-Tactical Command Support System (NTCSS)
Reserve Component Automation System (RCAS)
Standard Installation/Division Personnel System 3 (SIDPERS3)
Standard Procurement System (SPS)
Strategic War Planning System (SWPS)
Theater Medical Information Program (TMIP)

Strategic Warfare and Space Systems Programs (\$2.192M)

B1-B Lancer
B2 Advanced Technology Bomber
Evolved Expendable Launch Vehicle (EELV)
Medium Extended Air Defense System (MEADS)
National Airspace System (NAS)
National Missile Defense (NMD) System
Navy Theater Ballistic Missile Defense (TMBD)
Patriot P3I
Patriot Upgrade
Theater High Altitude Area Defense (THAAD)
TITAN IV Space Booster
Tomahawk Block IV / Theater Mission Planning Center (TMPC)

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Other Systems

Chemical Demilitarization

- Perform official travel to carry out oversight of DoD operational testing and evaluation. (\$.380M)

FY 2001 Plans:

- Review Service TEMPs and test plans and provide appropriate guidance to ensure test adequacy; observe preparation for, and conduct of, field operational tests; evaluate OT results and report evaluations to Congress and DoD senior management; and conduct assessments on programs to include evaluation of projected resource requirements and funding levels for OT&E. Programs benefiting from this oversight service will include:

Land Warfare Programs (\$2.941M)

Abrams Tank (M1A2) System Enhancement Program (SEP)
Army Tactical Missile System Brilliant Anti-Armor Submunition (ATACMS/BAT)
ATACMS-BAT/Pre-Planned Product Improvement (P3I)
Biological-Chemical Programs (Detection/Protection/Decontamination/C41)
Bradley Fighting Vehicle System (BFVS) -A3/M2A3 and M3A3 Program
Chinook (CH-47) Improved Cargo Helicopter (ICH)
Close Combat Tactical Trainer (CCTT)
Comanche RAH-66
CRUSADER Howitzer & Resupply Vehicle
High Mobility Multi-Purpose Light Tactical Vehicle (HMMLTV)
Javelin Advanced Anti-Tank Weapon System
Joint Distribution System (JDS)
Joint Modular Lighting System
Joint Surveillance Target Attack Radar System (JSTARS) Common Ground Station (CGS)
Kiowa Warrior (OH-58D)
Land Warrior
Line of Sight Anti-Tank (LOSAT) Weapon System
Longbow Hellfire Missile System
Multiple Launched Rocket System (MLRS) Upgrade
Nuclear-Biological-Chemical Reconnaissance System
(NBCRS) Reconnaissance Vehicle
Sense and Destroy Armor (SADARM)
Stinger Reprogrammable Microprocessor II (RMP II)

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Tactical Unmanned Aerial Vehicle (UAV) --Outrider
UH-60 Black Hawk Service Life Extension Program (SLEP)

Naval Warfare Programs (\$1.554M)

Advanced Amphibious Assault Vehicle (AAAV)
Advanced Integrated Electronic Warfare System (AIEWS)
Aegis SPY Radar (AN/SPY-1B/D/D(V))
AN/SQQ-89 Antisubmarine Warfare Combat System
Auxiliary Dry Cargo Carrier (T-ADC(X))
CH-60S Fleet Combat Support Helicopter
Cooperative Engagement Capability (CEC)
DD21 Land Attack Destroyer
DDG-51 Arleigh Burke Class Destroyer
Evolved Sea Sparrow Missile (ESSM)
Fixed Distributive System (FDS) and Advanced Deployable System (ADS)
Future Sea-Based Tactical Aviation Platform (CV/X)
LPD-17 Amphibious Assault Ship
MK-48 Advanced Capability (ADCAP) Torpedo
Virginia (SSN 774) Class Submarine
Rolling Airframe Missile (RAM)
Seawolf Class Nuclear Attack Submarine/Combat System (SSN-21/BSY-2)
SH-60R Multi-Mission Helicopter Program
Ship Self-Defense System (SSDS)
Standard Missile (SM-2) Block IIIB and Block IV/IVA
Strategic Sealift Ship (SSP)
Submarine External Communications System (SubECS)
TAGOS/SURTASS Surveillance Ship/Low Frequency Active (LFA) Sonar

Air Warfare Programs (\$2.297M)

Advanced Medium Range Air-to Air (AMRAAM)
AH-1 and UH-1 Helicopter Upgrades (4BN/4BW Upgrade)
AIM-9X Missile
C-130 Aircraft Modernization Program (AMP)
C-130J All Variants (KC-130J, EC-130J, WC-130J, C-130J-30, and C-130J)
C-17 Airlift Aircraft

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F/A-18 C/D Hornet
F/A-18 E/F Hornet
F-22 Air Superiority Fighter
Global Hawk High Altitude Endurance UAV
Joint Air-to-Surface Strike Missile (JASSM)
Joint Direct Attack Munition (JDAM)
Joint Primary Aircraft Training System (JPATS)
Joint Standoff Weapon (JSOW)
Joint Strike Fighter (JSF)
Joint Surveillance and Target Attack Radar System (JSTARS) E-8
Sensor Fused Weapon (SFW)
Standoff Land Attack Missile---Expanded Response (SLAM-ER)
T-45 Training System
Tactical Aviation Mission Planning System (TAMPS)
V-22 Osprey (Joint Vertical Airlift)

Electronic Warfare Programs (\$1.211M)

AAR-47 Upgrade
AN/ALR-56 (all versions) RWR -- all upgrades
AN/ALR-67 (all versions - includes AN/ALR-67[V]
3 Advanced Special Receiver) RWR -- all upgrades
AN/ALR-67E (V)2 RWR Upgrade
AN/ALR-69 (all versions) RWR -- all upgrades
AN/APR-39 (all versions) Radar Warning Receiver (RWR) -- all upgrades
B-1B Bomber Defensive System Upgrade Program (DSUP)
"EA-6B ""Prowler"" (includes AN/ALQ-99 Tactical Jamming System
and AN/USQ-113 Communications Jammer) -- all upgrades"
EA-6B Analysis of Alternatives Follow-on
EA-6B:
Band 7/8 Jammer
Improved Capability (ICAP) III
Low Band Transmitter
USQ-113 Connectivity Suite
F-15 Tactical Electronic Warfare System (TEWS) including
AN/ALQ-135 self-protection jammer -- all upgrades

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Integrated Defensive Electronic Countermeasures (IDECM)
Integrated Defensive Electronic Countermeasures (IDECM) Block II Interim Suite (RFCM/ALE-50)
Suite of Integrated Infrared Countermeasures / Common Missile
Warning System (SIIRCM/CMWS)
Suite of Integrated Radio Frequency Countermeasures (SIRFC)

Command, Control, Communications, and Intelligence Programs (\$3.757M)

All Source Analysis System (ASAS)
Army Global Command and Control System (AGCCS)
Army Tactical Command and Control System (ATCCS) Capstone
Battlefield Digitization
C2 Vehicle
Cheyenne Mountain Upgrade
Combat ID
Combat Survivor Evader Location (CSEL) System
Composite Health Care System (CHCS)
Defense Civilian Personnel Data System (DCPDS)
Defense Medical Logistics Standard Support (MLSS)
Defense Message System (DMS)
Distribution Standard System (DSS)
E-2C Hawkeye Airborne Early Warning
E-3A Airborne Warning and Control System (AWACS)
Radar System Improvement Program (RSIP)
E-6A TACAMO (multiple subprograms)
F-15 Fighter Data Link
Forward Area Air Defense System (FAADS) C3I
Global Transportation Network (GTN)
High Performance Computing Modification Plan (HPCMP)
Integrated Maintenance Data System (IMDS)
Joint Computer Aided Acquisition and Logistics Support (JCALS)
Joint Receiving Information Support System
Joint Service Imagery Processing System (JSIPS)
Joint Tactical Information Distribution System (JTIDS)
Maneuver Control System (MCS)
MILSTAR Satellite Communications System

R-1 Shopping List – Item No 2- 16 of 19

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Multifunctional Information Distribution System (MIDS)
NAVASTAR GPS User Equipment (UE)
Navy Standard Integrated Personnel System (NSIPS)
Non-Tactical Command Support System (NTCSS)
Reserve Component Automation System (RCAS)
Standard Installation/Division Personnel System 3 (SIDPERS3)
Standard Procurement System (SPS)
Strategic War Planning System (SWPS)
Theater Medical Information Program (TMIP)

Strategic Warfare and Space Systems Programs (\$2.012M)

B1-B Lancer
B2 Advanced Technology Bomber
Evolved Expendable Launch Vehicle (EELV)
Medium Extended Air Defense System (MEADS)
National Airspace System (NAS)
National Missile Defense Upgrade (NMDS)
Navy Theater Ballistic Missile Defense (TMBD)
Patriot P3I
Patriot Upgrade
Theater High Altitude Area Defense (THAAD)
TITAN IV Space Booster
Tomahawk Block IV / Theater Mission Planning Center (TMPC)

Additional DOT&E Oversight of Priority Areas. (\$3.000M) The August, DoD 1999 Program Decision Memorandum (PDM) provided \$3.0M to DOT&E to support additional DOT&E oversight of OUSD(AT&L) priority areas to include National Missile Defense (NMD) and Support to the Acquisition Community.

NMD: In January 1999, the Secretary of Defense announced a decision to budget substantial additional funding for the NMD program. Program Budget Decision 224C added an additional \$6.1B to the budget between FY01 and FY05 for the overall NMD program. The NMD program is unlike other programs in that it is comprised of multiple individual major systems to include: a weapon system, two radar systems, a communications system, and a command-and-control system. The testing of each of these systems equates in size and complexity to the testing of a standard Major Defense Acquisition Program (MDAP) and requires a minimum of three additional DOT&E action officers plus added Federally Funded Research and Development Center (FFRDC) contract support. Activity on the program has increased significantly in preparation for testing and assessing the technological potential of an NMD capability prior to the year 2000 Deployment Readiness Review. DOT&E has not had the resources to keep up with the pace of NMD activity. Furthermore, demands for analytical support are projected to continue to rise throughout the next six years as the system

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design matures and testing increases through to eventual deployment. This increased funding beginning in FY2001 will purchase vital additional oversight and analytic capability in the area of NMD. Without the additional funding for NMD test analysis, we would run the risk of an inadequate analysis of testing of the NMD program, which could result in a national investment in an extremely expensive strategic missile defense system that would be ineffective.

Support to the Acquisition Community: The Secretary of Defense has directed operational testers to become involved earlier in the acquisition process. As a result, DOT&E is experiencing a substantial workload increase. In order to adequately support this workload, additional resources have been provided beginning in FY2001.

One of the specific areas of increased workload is the Advanced Concept Technology Demonstration program. As of the start of FY2000, there were 45 ACTDs ongoing and another 12 under active consideration, with the number expected to continue to increase. In the past, DOT&E's participation in ACTDs was very limited. However, the Defense Science Board (DSB) has recommended that DOT&E support all ACTDs. The additional funding \$1.0M for FY2001 will provide the FFRDC analytic support to make this possible.

These funds will also provide, beginning in FY2001, for increased DOT&E support to C4I interoperability assessments. A major priority of the Under Secretary of Defense (Acquisition, Technology and Logistics) to counter emerging threats to future battlefield dominance is the interoperability of DoD C4I systems. As part of this effort, DOT&E has a new unplanned and unbudgeted requirement to partner with the U.S. Atlantic Command's (USACOM) Joint Experimentation Directorate. Through this partnership, T&E initiatives will be evaluated and subsequently transitioned into the acquisition system by participation in, and analyzing data from, joint experiments. An on-site DOT&E team will have first-hand knowledge of the CINC's joint experimentation requirements and can offer immediate access and support from across-the-board T&E community. As OT&E programs increasingly become mission-level (vice systems-level) testing oriented to include interoperability among Service and allied systems, additional contract support resources will be required.

Lastly, beginning in FY2001, DOT&E will become involved in the Logistics and Sustainment testing arena. The OUSD(AT&L) has stated his strong support for early operational test insights in logistics and sustainability. Additionally, the Department is placing strong emphasis on reducing total ownership costs of weapons systems. As a result, there is a strong need for detailed assessments of logistics, training, and contractor support of these weapons systems. While DOT&E has focused on combat effectiveness and suitability of weapons throughout the development process, we have not addressed many of the factors affecting life-cycle costs. Since DOT&E is involved early, the opportunity exists to develop early insights to the various cost drivers for a program and provide acquisition decision makers with the assessments that can be used to reduce those costs. The new funding will provide the contractual support to allow DOT&E to continue providing the much needed and directed early involvement and early support to the acquisition community.

Plans - Other Systems

Chemical Demilitarization

- Perform official travel to carry out oversight of DoD operational testing and evaluation. (\$.400M)

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B. (U) PROGRAM CHANGE SUMMARY

(\$ in Millions)	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
FY 2000 President's Budget	15.311	14.206	14.249
Appropriated Value	15.311	14.602	
Reprogramming Action: Funds Available for Y2K Conversion Efforts	12.900		
Adjustments to Appropriated Value			
Additional Budget for National Missile Defense (NMD) T&E Support			3.000
Nonpay Purchase Inflation Adjustment			(0.077)
Current Budget Submit	28.211	14.602	17.172

C. (U) OTHER PROGRAM FUNDING NA

D. (U) ACQUISITION STRATEGY: NA

E. (U) SCHEDULE PROFILE:

Fiscal Year actual and planned events by quarter

<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4

Contract Milestones: (See activities under Part A above.)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)					February 2000				
OPERATIONAL TEST AND EVALUATION, DEFENSE (0460) BUDGET ACTIVITY SIX			LIVE FIRE TESTING PE 0605131D8Z						
\$'s in Millions	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	COST TO COMPLETE	TOTAL COST
PE 0604940D	18.934	16.669	9.712	9.887	10.032	10.204	10.417	Continuing	Continuing

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

This program element, 0605131D8Z, directly supports the Congressional statutory requirements for oversight of Live Fire Test and Evaluation (LFT&E). The Federal Acquisition Streamlining Act of 1994 amended Title 10 to transfer, within the Office of the Secretary of Defense, responsibility for monitoring and reviewing the live fire testing activities of the Department of Defense. Responsibility was reassigned from the Director of Test, Systems, Engineering and Evaluation, Office of the Under Secretary of Defense (Acquisition and Technology), to the Director of Operational Test and Evaluation (DOT&E) in FY 1995.

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

The LFT&E program element also supports the DoD's Joint Live Fire (JLF) Program which began in 1984 under an OSD charter to test fielded front-line U.S. and threat combat aircraft and armor systems for their vulnerabilities and fielded weapons, both U.S. and threat, for their lethalties against their respective targets. The Congress, seeing the vulnerabilities and lethality issues raised by the JLF program of fielded systems, decided that there must be legislation to require that this realistic testing be done before these systems reach the field. Hence the Live Fire Test Legislation, Title X, Section 2366 was passed in 1987.

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For FY 1999, the Congress added \$4.0 million to the LFT&E PE for Radio Frequency (RF) Weapon Vulnerability Assessments. The LFT&E Program has been testing and evaluating the on-target effects of potential directed energy weapons (laser and RF) over the past two years.

The LFT&E program element also funds other activities used to support the functions of the LFT&E, JLF, LFT&T, and RF programs. The other activities, outlined below, are “Crew Casualty Assessment,” “Exploring New Technologies/Advanced Concepts and Survivability Initiatives,” and “Assuring Modeling and Simulation Adequacy.” Efforts in those categories are undergoing significant changes during FYs 1999 and 2000, as emphasis is growing on modeling and simulation in support of LFT&E.

LFT&E funding is part of management oversight over research, development, test, and evaluation (RDT&E) of new systems, as well as RDT&E of fielded systems, and therefore budgeted in Program Element Research Category 6.5.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1999 Accomplishments

COMPLETED:

Review and Monitor Major T&E Programs (\$3.586M): Completed development of the LFT&E Strategies for the CH-47D Improved Cargo Helicopter (ICH), M1A2 (Abrams Tank), Rolling Airframe Missile (RAM) Block 1, Follow-On to TOW (FOTT), M829E3 120mm Armor Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T) tank ammunition, and the XM1001 40mm Canister Cartridge. Approved updated Test and Evaluation Master Plans (TEMPs) for DD-21 Land Attack Destroyer and Seawolf (SSN-21). Approved alternative plans and concurred on LFT&E waiver certifications for CH-47D Improved Cover Helicopter (ICH), and for the MH-47E and MH-60K Special Operations Aircraft (SOA). Reviewed Event Design Plans for M1-based Wolverine Heavy Assault Bridge (HAB) and Grizzly Breacher, Command and Control Vehicle (C2V), M2A3 Bradley Fighting Vehicle System (FVS), Sensor Fuzed Weapon (SFW) P³I, M1 Grizzly Breacher, and F/A-18E/F Super Hornet. Reviewed Test Plans for all test programs currently in the execution phase, including V-22 Osprey, Stand-Off Land Attack Missile-Expanded Response (SLAM-ER), M2A3 Bradley FVS, C2V, and M1 HAB. Completed LFT&E testing of Sense and Destroy Armor Munition (SADARM) and the Wide Area Munition (WAM) program, with the report to Congress completed in FY 1999. Completed LFT&E Testing and Report to Congress for the Army Tactical Missile System (ATACMS) Block 1A, and the M993 7.62mm and M995 5.56mm armor piercing (AP) cartridges.

Manage Joint Live Fire Programs (\$3.829M): Completed testing on the static and dynamic vulnerability of the Cobra AH-1S helicopter tail rotor gear boxes, drive shafts, and fuel distribution systems, including an assessment of the battle damage and repair techniques on all these components. Provided helicopter damage predictions for all AH-1S components listed above, and completed a special study on the aerodynamic effects of vibrational damage resulting from ballistically damaged rotor blades. Completed all planned testing on the Spirit (classified system) armored target, although additional threat ammunition may become available for further testing against this target. Began testing of man-portable air defense systems (MANPADS) against F-14 and F-16 aircraft.

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Crew Casualty Assessment (\$0.750M): Conducted a Ground Collision Avoidance System (GCAS) Gravity-Induced Loss of Consciousness (G-LOC) flight demonstration. The G-LOC flight test demonstration evaluated the capability of the current GCAS design to recover aircraft from flight profiles typical of G-LOC incidents. The project “Transition of a Combined Toxic Gas Lethality Model to an Injury Model” was completed.

Assuring Modeling & Simulation Adequacy (\$1.114M): Completed a study of physics-based modeling techniques and their application to LFT&E problems. This activity, coordinated with the Department of Energy (DOE) laboratories, produced several technical proposals for improving key modeling capabilities. Completed an update and release of the Target Interaction Lethality and Vulnerability (TILV) Master Plan to support the Technology Area Review and Assessment (TARA) process.

Live Fire Test and Training (\$5.000M): Funded continuation of the five projects started in FY 1997 to transition simulation and modeling technologies between the live fire test and evaluation community and the military training communities. The projects include small arms effectiveness, combat trauma patient simulation, lethality/vulnerability simulation enhancements, visual target modeling, and synthetic environment support for live fire test of ground vehicles in visual target modeling, incorporating Battle Damage Assessment and Repair (BDAR) into training, and analyzing feasibility of incorporating virtual reality into Total Ship Survivability Trials (TSST). Funded initiation of four new projects in FY 1999 in the areas of dismounted infantry survivability and lethality, enhanced recovery of aircrew from gravity-induced loss of consciousness, battle damage assessment, and non-ballistic live fire test and training for laser threats. Completed solicitation phase that resulted in receipt of 47 proposed projects for funding consideration for FY 2000. Completed evaluation of proposals and selected 7 new projects for initiation in FY 2000. Set up and hosted a second annual National Conference on Testing and Training Partnerships in Orlando, Florida.

Radio Frequency (RF) Weapons Vulnerability Assessment (\$4.000M): Issued a broad agency announcement seeking qualified sources and soliciting research and development proposals which are capable of providing services in the achievement of development, test, and evaluation of RF devices and asymmetric threats. Completed the solicitation and evaluation phase that resulted in the receipt and review of 28 proposed efforts. Awarded contracts to a selected subset of these vendors. Supported a field test of a RF device against a building containing a set of test objects consisting primarily of off the shelf computer technologies.

Official Travel and Administrative Support (\$0.655M): Perform official travel and procure administrative support to carry out oversight of Live Fire Test and Evaluation programs as well as fund efforts of common interest with the Director, Operational Test and Evaluation.

ONGOING:

Review and Monitor Major T&E Programs: Provided oversight on the vulnerability of: the Advanced Amphibious Assault Vehicle (AAAV), the Command and Control Vehicle (C2V), the Crusader System (Self-Propelled Howitzer [SPH] and Resupply Vehicle (RSV), the M1-based Grizzly Breacher, the M1A2 Upgrade (Abrams-FY2000), the M2A3 and M3A3 Bradley Fighting Vehicle System (FVS) (M2/M3) Upgrades, the M1-based Wolverine HAB, the Light Tactical Vehicle (LTV), the Line-of-Sight Anti-Tank (LOSAT) weapon system, the AH-1W Helicopter Upgrade, the UH-60L Blackhawk, the Longbow Apache, the Airborne Laser (ABL), the UH-1N Helicopter Upgrade, the B-1B Lancer, the B-2 Spirit, the F-22 Raptor, the F/A-18E/F Super Hornet, the MH-47E Special Operations Aircraft, MH-60K Special Operations Aircraft, the OH-58D Kiowa Warrior,

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H-1 Helicopter Upgrades, the CH-60 Helicopter, the SH-60R Multimission Helicopter, the CH-47 Chinook Upgrade, the C-130J aircraft, the Joint Strike Fighter (JSF), the RAH-66 Comanche, the V-22 Osprey, the DD-21 Land Attack Destroyer, the CVNX Next Generation Aircraft Carrier, the NSSN (Virginia Class, SSN-774) New Attack Submarine, the SSN-21 Seawolf Class Submarine, the DDG-51 Arleigh Burke Class Guided Missile Destroyer, the Auxiliary Dry Cargo Ship (T-ADC(X)), and the LPD-17 Amphibious Transport Dock Ship. Provided oversight on the lethality of: the Army Tactical Missile System (ATACMS) Block 1A (APAM) and Block II (BAT), the Longbow HELLFIRE, the M829E3 120mm Armor-Piercing Fin-Stabilized Discarding Sabot Tracer (APFSDS-T), the Multiple Launch Rocket System (MLRS) (Guided Rocket (G-MLRS) and Extended Range Rocket (MLRS-ERR) versions), the XM1001 Cartridge, the Mk48 Advanced Capability (ADCAP) Torpedo, the Joint Direct Attack Munition (JDAM), the Medium Extended Air Defense System (MEADS), the Navy Area Tactical Ballistic Missile Defense (TBMD), the Navy Theater Wide (NTW) System, the Follow-On-To-Tow (FOTT), the Javelin Alternate Main Charge Warhead (AMCW), the Joint Air-to-Surface Standoff Missile (JASSM), the Joint Stand-Off Weapon (JSOW) (BLU-97, BLU-108, and Unitary warheads), the Line-of-Sight Anti-Tank (LOSAT) weapon, the Enhanced Fiber-Optic Guided Missile (EFOG-M), the M993 and M995 Armor Piercing Cartridges, the Objective Crew Served Weapon (OCSW), the Objective Individual Combat Weapon (OICW), the Sense and Destroy Armor Munition (SADARM), the Sensor Fuzed Weapon (SFW), the Stand-off Land Attack Missile-Expanded Response (SLAM-ER), the Standard Missile Block IVA, National Missile Defense (NMD), the Tomahawk Block IV, the Tactical Tomahawk, the Wide Area Munition (WAM), the Advanced Medium Range Air to Air Missile (AMRAAM), the AIM-9X Sidewinder missile, the Evolved Sea Sparrow Missile (ESSM), the Rolling Airframe Missile (RAM), the Lightweight Hybrid Torpedo (LHT), the Airborne Laser (ABL) system, the Patriot Advanced Capability-3 (PAC-3), and Theater High Altitude Area Defense (THAAD).

Review and Monitor Joint Live Fire Programs: Continued oversight of Joint Live Fire (JLF) armor/anti-armor and aircraft test programs. Analysis of data collected in FY 1997, FY 1998, and FY 1999 continues. Specifically, the analysis of the static-versus-dynamic testing methodology to determine the vulnerability of AH-1S helicopter engines and transmissions to: 1) assess their vulnerability when under load, 2) assess the adequacy of the test procedures followed for evaluating helicopter vulnerability, 3) assess the adequacy of damage models to predict the vulnerability of helicopter components and resulting probability of kills, 4) assess the difference between full-up and component-level testing, and 5) conducted battle damage assessment and repair exercises for actual ballistic impacts into operational aircraft. Started testing Spirit (classified system) and land combat system versus ballistic threats; testing will continue and is expected to be completed with analysis and reporting performed in FY 2000. The JLF program started planning a series of ballistic tests (using U.S. munitions) on SCUD B missiles in FY 1997; this effort is planned to start with actual testing in FY 1999.

Crew Casualty Assessment: Applications of software for crew casualty assessments were integrated into the Advanced Amphibious Assault Vehicle (AAAV) and C2 Vehicle LFT&E programs and the DD-21 and the DDG-51 Total Ship Survivability Test programs. Continued evaluation of aircraft mishaps due to contribution of gravity-induced loss of consciousness (G-LOC).

Exploring New Technologies/Advanced Concepts and Survivability Initiative: Continued participation in the development of new facilities to explore new technologies such as high power microwave and other directed-energy weapons. Monitored and participated in an ongoing effort to conduct a strategic warhead vulnerability exploitation to gain insights into defeat of strategic missiles in flight. These efforts are restricted to the LFT&E aspects of these technologies, rather than the development of the technology. Many of these programs are jointly funded in concert with the

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military services' in-house funded efforts. This ensures adequate linkage between the Office of the Secretary of Defense (OSD) and the technical communities such as the Joint Technical Coordinating Group/Munitions Effectiveness (JTTCG/ME), the Joint Technical Coordinating Group/Aircraft Survivability (JTTCG/AS), the Survivability/Vulnerability Information Analysis Center (SURVIAC), and the Joint Live Fire test agencies.

Assuring Modeling & Simulation Adequacy: 1) Continued to actively support Modeling and Simulation (M&S) policy and its integration into test and evaluation (T&E) strategies. 2) Updated the Target Interaction Lethality and Vulnerability (TILV) report to support decisions on Research, Development, Test, and Evaluation (RDT&E) funding. The transition of TILV to a structure co-chaired by the Director, Defense Research and Engineering provides a direct link between the T&E needs identified by the lethality/vulnerability subject matter experts in the services and the R&D prioritization process in OSD. 3) The Safety and Survivability of Aircraft Initiative has shown strong progress in the improvement of the modeling of dry bay fires on aircraft and detailed plans are being developed for next year's activities subject to available funds. Due to uncertainties in Ballistic Missile Defense (BMD) Office funding for related activities, the assessment of hypervelocity impact assessment started behind schedule. These three initiatives involve the DOE labs, Service labs and test agencies, OSD acquisition elements, and the Institute for Defense Analyses. The development of strategy to extend and coordinate the physics-based modeling activities with other department initiatives such as the High Performance Computing Modernization effort, Simulation Based Acquisition, and BMD M&S efforts will continue. Integrated Validation, Verification, and Accreditation processes were incorporated into the modeling and simulation efforts for DDG-51 guided missile destroyer, DD-21 land attack destroyer, LPD-17 transport ship, and B-1B bomber.

Live Fire Test and Training: Continued to monitor the progress of projects under the LFT&E Program. Three of the five projects forming the original program in FY 1997 will be completed; one was completed in FY 1998. Of the three new projects started in FY 1998, and the continuing one from FY 1997, all are expected to be completed in FY 2000. Four new projects were added in FY 1999 for a total of eight. Seven new projects will be started in FY 2000 for a total of 15 projects underway.

Radio Frequency (RF) Weapon Vulnerability Assessments: Initiated an assessment of the requirements for testing of the vulnerability of U.S. military systems to RF threats.

FY 2000 Plans:

Review and Monitor Major T&E Programs (\$3.451M): Complete LFT&E technical assessments for those systems approaching due dates for LFT&E reporting to Congress such as Joint Stand-Off Weapon (JSOW) (BLU-97 warhead), Stand-Off Land-Attack Missile-Expanded Response (SLAM-ER), B-1B Lancer Conventional Mission Upgrade Program (CMUP), B-2 Spirit, MH-47E and MH-60K Special Operations Aircraft, Rolling Airframe Missile (RAM), Command and Control Vehicle, and SH-60B Light Airborne Multi-Purpose System (LAMPS). Oversight of continuing efforts in FY 2000 will include: the Advanced Amphibious Assault Vehicle, the Crusader field artillery system, the M1-based Grizzly Breacher, the Light Tactical Vehicle, the M1A2 Upgrade, the M2A3 Bradley FVS upgrade, the M1-based Wolverine Heavy Assault Bridge (HAB), the Cobra AH-1W Upgrade, the Longbow HELLFIRE, M829E3 120mm Armor-Piercing Fin-Stabilized Discarding Sabot-Tracer (APFSDS-T) ammunition, the Multiple Launch Rocket System (MLRS) (Guided), the High Mobility Rocket System (HIMARS), the Stinger Reprogrammable Microprocessor (RMP)

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missile, XM1001 Cartridges, the Mk48 Advanced Capability (ADCAP) torpedo, the JDAM weapon, the Medium Extended Air Defense System (MEADS), Navy Theater Wide missile defense, the UH-1N Upgrade, the B-1B Lancer Conventional Munitions Upgrade Program (CMUP), the F-22 Raptor, the F/A-18E/F Super Hornet, the Joint Strike Fighter, the OH-58D Kiowa Warrior, the RAH-66 Comanche, the V-22 Osprey, the CVN(X) aircraft carrier, the SSN-774 (Virginia Class) attack submarine, the SSN-21 (Seawolf) submarine, the DDG-51 guided missile destroyer, the LPD-17 transport ship, the ATACMS Block II (BAT), the Follow-on-to-TOW (FOTT), the Javelin Alternate Main Charge Warhead (AMCW) system, the Joint Air to Surface Stand-off Missile (JASSM), the Joint Standoff Weapon (JSOW) (BLU-108 and Unitary warheads), the Objective Crew Served Weapon (OCSW), the Objective Individual Combat Weapon (OICW), Sense and Destroy Armor Munition (SADARM), the Sensor Fuzed Weapon (SFW), the Advanced Medium Air-to-Air Missile (AMRAAM), the AIM-9X Sidewinder missile, the Evolved Sea Sparrow Missile (ESSM), the Navy Area Tactical Ballistic Missile Defense System, Patriot Advanced Capability (PAC-3), Theater High Altitude Area Defense (THAAD), the Airborne Laser (ABL) system, the Medium Extended Air Defense (MEADS) System, and the National Missile Defense (NMD) System.

Review and Monitor Joint Live Fire Programs (\$3.750M): The F-16 JLF Program will determine the vulnerability to foreign MANPADS threats by identifying kill mechanisms and impacts to flight performance. The principal objectives are to: 1) obtain a physical understanding of kinetic energy kill mechanism, 2) identify vulnerable areas for potential reduction techniques, and, 3) collect test data to be used when performing predictive analyses. The F-14 JLF Program will continue to evaluate the vulnerability of its fuel system to gun and missile threats. Additionally, it will collect data to enhance existing analytical models and to aid the operational community in refining tactics and the design community to develop inexpensive hardware changes that will enhance survivability. CH-47D rotor blade tests will start in FY 2000. The advance planning for live fire testing of F-117 and C-130H aircraft components and/or subsystems will continue.

Crew Casualty Assessment (\$.250M): Continue the evaluation of aircraft mishaps due to contribution of gravity-induced loss of consciousness (G-LOC). Conduct a Ground Collision Avoidance System (GCAS) G-LOC flight demonstration with Air Force Combat Command operational pilots.

Exploring New Technologies/Advanced Concepts and Survivability Initiative (\$.750M): Begin sponsor testing program of contractor supplied passive ullage protective systems. A Broad Agency Announcement was written to solicit techniques to significantly reduce the risk of explosive fires in fuel tanks as a result of ballistic impact.

Assuring Modeling & Simulation Adequacy (\$.900M): Under the Safety and Survivability of Aircraft Initiative (SSAI) program, continue to address dry bay fire modeling and incorporate the explosive modeling techniques developed at the National Labs under the TWA Flight 800 effort. Continue hypervelocity impact work to identify and document the applicability of hydrocodes and engineering analysis tools to the problem of assessing intercept lethality. The physics-based modeling initiative will evolve and expand to incorporate elements of other DoD M&S efforts. Working meetings will be arranged to coordinate R&D, DoD High Performance Computing (HPC), technical support from DOE and Service labs, and acquisition decision needs from developmental testing through operational testing, including LFT&E. These meeting attendees will be of sufficiently high level to develop a Memorandum of Understanding committing the signatories to support a focused effort. Initiate an update of the Target Interaction, Lethality, and Vulnerability (TILV) Master Plan to support Directed Energy Weapons.

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Live Fire Testing and Training (\$6.918M): Complete the Effectiveness of Small Arms Fire project started under the FY 1997 program. Complete the Battle Damage Assessment and Repair, Realistic Munitions Impact Flash Events, and Augmented Reality for Total Ship Survivability Test projects started under the FY 1998 program. Complete the Enhance Recovery/Training of Aircrew, the LFT&E Training Opportunities for Battle Damage Assessment, and Non-ballistic Live Fire Test and Training Laser Threats projects started under the FY 1999 program. Complete solicitation, evaluation, and selection process to identify appropriate FY 2000 projects and initiate projects to the extent that funding allows.

Radio Frequency (RF) Weapons Vulnerability Assessment (no FY00 \$): Continue the assessment of the requirements for testing of the vulnerability of U.S. military systems to asymmetric threats. Initiate vulnerability testing and evaluation of the threat of RF devices (characteristic of what a rogue nation or terrorist could fabricate using only “open source” information and available hardware components) on modern and future military systems, support infrastructure, and systems under development using commercial off-the-shelf technology, which could or will have military application. These systems will be evaluated with regard to their vulnerability, susceptibility, and survivability to degradation, disruption, upset, and damage from the RF devices. The testing will be conducted in realistic environments where such RF devices would be used. A senior advisory group consisting of LFT&E personnel, RF experts, and senior military advisors will be formed and will meet frequently to review program progress and results.

Official Travel and Administrative Support (\$.650M): Perform official travel and procure administrative support to carry out oversight of Live Fire Test and Evaluation programs as well as fund efforts of common interest with the Director, Operational Test and Evaluation.

FY 2001 Plans:

Review and Monitor Major T&E Programs (\$3.550M): Complete LFT&E technical assessments for those systems approaching due dates for LFT&E reporting to Congress. Oversight of continuing efforts in FY 2001 will include the Advanced Amphibious Assault Vehicle, the Crusader field artillery system, the M1-based Grizzly Breacher, the Light Tactical Vehicle, the M1A2 Abrams Tank Upgrade, the M2A3 Bradley FVS upgrade, the M1-based Wolverine Heavy Assault Bridge (HAB), the AH-1W Helicopter Upgrade, the Longbow HELLFIRE, M829E3 120mm APFSDS-T ammunition, the Multiple Launch Rocket System (MLRS) (Guided), the High Mobility Rocket System (HIMARS), the Stinger-Reprogrammable MicroProcessor (RMP) missile, XM1001 Cartridges, the Mk48 Advanced Capability (ADCAP) torpedo, the Joint Direct Attack Munition (JDAM) weapon, the Medium Extended Air Defense System (MEADS), Navy Theater Wide missile defense, the UH-1N Upgrade, the B-1B Lancer Conventional Mission Upgrade Program (CMUP), the F-22 Raptor, the F/A-18E/F Super Hornet, the Joint Strike Fighter, the OH-58D Kiowa Warrior, the RAH-66 Comanche, the V-22 Osprey, the CVN(X) aircraft carrier, the Virginia Class (SSN-774) attack submarine, the Seawolf (SSN-21) submarine, the DDG-51 guided missile destroyer, the LPD-17 transport ship, the ATACMS Block II (BAT), the Follow-on-to-TOW (FOTT) , the Javelin Alternate Main Charge Warhead (AMCW) system, the Joint Air to Surface Stand-off Missile (JASSM), the Joint Standoff Weapon (JSOW) (BLU-108 and Unitary warheads), the Objective Crew Served Weapon (OCSW), the Objective Individual Combat Weapon (OICW), Sense and Destroy Armor Munition (SADARM), the Sensor Fuzed Weapon (SFW), the Advanced Medium Air-to-Air Missile (AMRAAM), the AIM-9X Sidewinder missile, the Evolved Sea Sparrow Missile (ESSM), the Navy Area Tactical Ballistic Missile Defense System, Patriot Advanced Capability

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(PAC-3), Theater High Altitude Area Defense (THAAD), the Airborne Laser (ABL) system, the Medium Extended Air Defense (MEADS) System, and the National Missile Defense (NMD) System.

Review and Monitor Joint Live Fire Programs (\$3.800M): Conduct tests of fielded systems not previously tested under Air, Land, or Sea Joint Live Fire programs. This fiscal year should see the completion of the fourth phase of testing for helicopters and initiate tests of foreign system acquired for exploitation. Testing of F-14 aircraft will continue, and F-117 and C-130H aircraft component and/or subsystem tests are expected to begin.

Crew Casualty Assessment (\$.250M): Complete the effort toward investigating the issues and potential user casualty risks associated with the operational impact of acceleration-induced incapacitation caused by highly dynamic aircraft flight.

Exploring New Technologies/Advanced Concepts and Survivability Initiative (\$.600M): Continue to sponsor testing of contractor-supplied passive ullage protective systems.

Assuring Modeling & Simulation Adequacy (\$.800M): Continue strong emphasis on understanding the application of physics-based modeling and simulations to test programs and the evaluation of their adequacy. Generate resources for continuing SSAI and provide seed funding for other efforts stemming from the LFT&E physics-based modeling workshops. Assure that programmatic focus is maintained in the development and application of M&S tools and that training capabilities are continuously improved to reflect more credible models. Push for a more consistent infrastructure for managing the M&S that supports T&E specifically and the acquisition process in general. In an environment of shrinking resources it is essential to understand the marginal return on M&S investment. Complete an update to and release of the Target Interaction, Lethality, and Vulnerability (TILV) Master Plan to support Directed Energy Weapons.

Live Fire Testing and Training (no FY01 \$ identified): Continue projects started in prior years and start new projects to the extent funding allows.

Radio Frequency (RF) Weapons Vulnerability Assessment (no FY01 \$ identified): Continue the testing of the vulnerability and survivability of U.S. military systems and commercial off-the-shelf (COTS) technologies to potential asymmetric RF devices of differing wavelengths to the extent funding permits. Expand the test and evaluation program to encompass more military weapon systems, new COTS technologies, and other directed energy threats.

Official Travel and Administrative Support (\$.712M): Perform official travel and procure administrative support to carry out oversight of Live Fire Test and Evaluation programs as well as fund efforts of common interest with the Director, Operational Test and Evaluation.

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B. (U) PROGRAM CHANGE SUMMARY

(\$ in Millions)	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
FY 2000 President's Budget	18.934	9.832	9.755
Testing and Training Initiative		7.000	
Appropriated Value	18.934	16.832	
Adjustments to Appropriated Value			
Government-wide Rescission		(0.163)	
Nonpay Purchase Inflation Adjustment			(0.043)
Current Budget Submit	18.934	16.669	9.712

C. (U) OTHER PROGRAM FUNDING NA

D. (U) ACQUISITION STRATEGY: NA

E. (U) SCHEDULE PROFILE:

Fiscal Year actual and planned events by quarter

<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4

Contract Milestones: (See activities under Part A above.)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2)							February 2000		
OPERATIONAL TEST AND EVALUATION,DEFENSE (0460) BUDGET ACTIVITY SIX			TEST AND EVALUATION (T&E) PE 0605804D						
\$'s in Millions	FY 1999*	FY 2000*	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	COST TO COMPLETE	TOTAL COST
PE 0605804D	94.253	99.840	53.275	53.273	55.220	56.446	57.679	Continuing	Continuing

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

***FY 1999 and FY 2000 funding for the Test and Evaluation program element is budgeted in the Director Test and Evaluation, Defense appropriation (TI 0450).**

On June 7, 1999, Secretary Cohen approved the disestablishment of the office of the Director, Test, Systems Engineering and Evaluation. In order to strengthen the role of the Director, Operational Test and Evaluation (D,OT&E) and consequently test and evaluation in OSD, the preponderance of the mission will be consolidated under the D,OT&E. The D,OT&E will manage the Threat Systems (TS), the Precision Guided Weapons Countermeasures (PGWCM), and the Joint Technical Coordinating Groups on Aircraft Survivability (JTTCG/AS) and Munitions Effectiveness (JTTCG/ME)), and the management and oversight activities related to DoD T&E functions and the Major Range Test Facilities and Bases (MRTFBs). Funds for these efforts are now budgeted in the DOT&E (0460) appropriation beginning in FY 2001.

The Undersecretary of Defense for Acquisition, Technology and Logistics/Director, Strategic and Tactical Systems (USD(AT&L)/S&TS), will retain the management and oversight of the Joint Test and Evaluation (JT&E) program and developmental testing of weapons systems. Accomplishments for FYs 1999 and 2000 are found in the Defensewide RDT&E (0400) appropriation, PE 0605804D. Beginning with FY 2001, the accomplishments and funds for these activities will be transferred to the Defensewide RDT&E (0400) appropriation, PE 0605804D.

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THESE PROGRAMS TRANSFER TO D,OT&E

Unique programs that remain in this appropriation and in this PE include the T&E Programs: TS, PGWCM, JTCG/AS; and JTCG/ME.

The T&E programs are continuing efforts that provide management and oversight of DoD T&E functions and T&E expertise to the DoD. TS provides OSD policy and oversight to Service Threat Simulator developments to ensure increased commonality, minimize duplications and provide consistent validation. TS funds the management and oversight functions for development of threat specifications and threat simulators, threat representative targets used for T&E, integration of T&E requirements for Foreign Material Acquisition (FMA), and DoD validation of threat simulators and digital threat models. PGWCM, a DoD Joint Service T&E Directorate, conducts analysis and T&E of Electro-Optical (EO), Infrared (IR), Radar, and Millimeterwave (MMW) weapons, countermeasures (CM) equipment and warning devices for the Services, T&E Agencies, and the Intelligence Community. The JTCG/AS supports joint research development test and evaluation programs to enhance the combat survivability of aircraft. This Tri-Service organization serves as the DoD focal point for aircraft survivability and represents the Joint Logistics Commanders (JLC) and their Joint Aeronautical Commanders Group (JACG) in dealings with OSD, industry, and other Service agencies. Under the auspices of the JLC the JTCG/ME publishes the Joint Munitions Effectiveness Manuals (JMEM) which contain weapons effectiveness estimates for all fielded non-nuclear weapons for the DoD. Weapons effectiveness data is available in both paper and electronic media (CD-ROMs, diskettes and via classified computer networks). JMEMs are used by the Armed Forces of the United States, NATO and other allies to plan operational missions, support training and tactics development, and support force-level analyses. The JTCG/ME also develops and standardizes methodologies for evaluation of munitions effectiveness and maintains databases for target vulnerability, munitions lethality and weapon system accuracy. JTCG/AS and JTCG/ME alternately chair the Survivability/Vulnerability Information Analysis Center (SURVIAC) Technical Coordinating Group (TCG).

This Research Category 6.5 PE supports joint military testing of the Department's weapons systems to determine if they meet their detailed performance requirements for the Joint Staff and the Services and management of the DoD test and evaluation process.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1999 Accomplishments:

JT&E Programs

- **Accomplishments for the JT&E program are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

T&E Programs

- PGWCM tested, analyzed and reported 27 EO and MMW precision guided weapons systems/components in a countermeasures environment as listed below by Component:
 - Air Force:
 - Powered-Low Cost Autonomous Attack System (P-LOCAAS), Sensor Fuzed Weapon (SFW), Special Operations Command/Directed Infrared Countermeasure (SOCOM/DIRCM), Agent Defeat Weapon (ADW)
 - Army:

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- WIDGET (code name), AH-1W/Electronic Warfare Suite (EWS), HH-60/ALQ-144A/B , HH-60/MJU-49B/52B (flares), Vehicle Visible Light Receiving -1 (VVR-1), Universal Semi-active Laser Jammer (USJ)
- Navy/Marines:
 - BISTEM (code name)/Land/Sea, Electronic Warfare Advanced Technology (EWAT), Laser Warning Receiver Systems (LWRs), Naval Research Laboratory-Laser Warning Receiver (NRL-LWR), MV-22, Advanced Electro-Optical Threat Characterization and Collection System (AEOTCCS), Small Baseline Vector Scoring (SBVS)
- Foreign: Drozd Active Protection System, Foreign Active Protection System (FAPS), Foreign Laser Illumination Night Sight (FLINS)
- Modeling and Simulation (M&S):
 - Foreign Laser Beam Rider (FLBR), Operational Test-Visualization (OT-VIS) support for Pronghorn test, Missile Constructively Simulated Operational Field Tool (MCSOFT) support for MV-22
- Other:
 - The Technical Cooperation Program (TTCP) Pronghorn Test
- Priority projects and efforts initiated by DESA in prior years and transferred to the Air Force will continue. These include non-traditional T&E support to the JCS, numerous Defense and non-Defense government agencies, National Level Programs, and the Services. Greatest preponderance of effort will be centered around T&E support to DoD ACTDs and providing T&E expertise to existing and emerging Service Battle Labs.
- Threat Systems:
 - Simulators
 - Executed the DoD validation program for threat simulators and threat digital models.
 - Continued management and oversight over Service threat simulators and threat digital models.
 - Continued threat support to T&E by investigations of current scientific and technical developments for use in Service threat representation programs (e.g., IR Missile Miss Distance Correlation, and Mission Level Modeling).
 - Continued cooperative technical research and test bed projects to facilitate threat representation (e.g., Correlation of EC Test Data and Methodology Demonstration, and Threat Simulators in Support of Information Operations).
 - Updated the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for T&E.
 - Targets
 - Continued management and oversight over Service threat representative targets.
 - Maintained the framework in updating the roadmaps that captured requirements data, facilitated the development of a strategy, and depicted the target vision of the future.
 - Provided OSD seed funds to prototype solutions to highest priority deficiencies in current target systems.
 - Supported the development of new target modeling and simulation capabilities/tools that met multi-Service T&E needs within common/DoD standard architecture (e.g., target electronic countermeasures miniaturization, common digital architecture (CDA) implementation and familiarization, and JSAT technology assessment/risk reduction).
 - Provided oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
 - Continued cooperative technical research that addressed shortfalls identified within the target validation program.
- JTCG/AS
- Initiated MANPADS vulnerability assessment methodology development.

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- Initiated vectored thrust nozzle and thermal energy management technology vulnerability reduction efforts.
- Together with JTCG/ME continued development of the Advanced Joint Effectiveness Model (AJEM), a physics based vulnerability, lethality and end game simulation.
- Initiated microwave (MW) and countermeasures (CM) technique to identify and counter next generation SAM and A-A missile threats.
- Completed advanced IR signature programming and initiate composite laser vulnerability.
- Completed laser beam-rider CM development and coherent high power electronic attack pod development.
- Completed Imaging Seeker Infrared Countermeasure (IRCM) technique development and cooperative countermeasures.
- Completed tier 2 & 3 threat algorithm analysis for use in Common Missile Warning System.
- Along with JTCG/ME, completed development of component vulnerability archive incorporating methodologies, analyses and test data for components including air vehicles, lightly armored ground vehicles and fixed hardened targets covering a range of damage mechanisms from penetration to shock vibration.
- Completed quantification of survivability improvements of a more electric aircraft over a typical hydraulic system.
 - Completed engine control and weapons bay vulnerability reductions tasks.
- JTCG/ME
 - Completed conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v2.0, WinJMEM v2.1, Joint Antiair Combat Effectiveness – Air Defense (JACE-AD) v1.0, World Infantry and Tanks Systems (WITS) beta version, v1.0, Target Vulnerability Manual v3.0 on JAWS, and Special Operation v2.0);
 - Distributed products via the classified internet with the Special Operations Target Vulnerability/Weaponeering Manual increments 5/6/7, and the Joint Product and Information Access System (JPIAS) beta version.
 - Continued expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 15, and Surface-to-Surface Direct/Indirect Fire);
 - Continued execution and technical coordination efforts to address Target Vulnerability data generation and methodology improvements (i.e., bridge, building/contents, industrial components, and rock penetration);
 - Continued the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., visualization tools, delivery accuracy, building analysis, collateral damage, smart munitions and search/target acquisition);
 - Conducted Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., COVART/FATEPEN, MEVA, Air Target Geometries, BEAMS, ORCA, ASAP, AJEM, SUBVEM and JSWM);
 - Together with the JTCG/AS, released Advanced Joint Effectiveness Model (AJEM) BETA version (with features including Fire Initiation, Ullage Explosion, Composite Materials, HEI Projectile Combined Effects, and Continuous Rods).

T&E Independent Activities:

- Major Range and Test Facility Base (MRTFB) Responsibilities
 - To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test

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Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
 - Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
 - Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
 - Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
 - Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.
- **Modeling and Simulation (M&S) Responsibilities**
- Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.
- Administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.
- **Defense Test and Evaluation Professional Institute (DTEPI)**
- Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges
 - Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
 - Completed training course Environmental Issues in Test and Evaluation
 - Completed training course Operational Effectiveness & Suitability and Live Fire Testing
 - Started development of WEB-based Just-in-Time Information on Simulation Test and Evaluation Process
- **Accomplishments for the assessment of developmental weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

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FY 2000 Accomplishments:

JT&E Programs

- **Accomplishments for the JT&E program are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

T & E Programs

- **PGWCM will test, analyze, and report on 20-25 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat warning systems as listed below by Component:**

Air Force:

- P-LOCAAS, SFW, Airborne Laser (ABL), Joint air-to-air surface stand off missile (JASSM), ADW

Army:

- Brilliant Anti-Tank (BAT) Pre-Planned Product Improvement (P3I), Javelin, Suite of Integrated Infrared CM (SIIRCM)/ Common Missile Warning System (CMWS), Precision Guided Mortar Munition (PGMM), Longbow P3I, WIDGET (Code Name) II

Navy/Marines:

- BISTEM, EWAT, LWRS, NRL-LWR, MV-22, Tactical Directed IRCM (TADIRCM), AAR-47 Sensor Upgrade (SU), AAR-47 SU/Laser Warning

Foreign:

- Laser Beam Rider (LBR), Precision Guided Munition (PGM), Active Protection System (APS), Night Sights

M&S:

- Review applicability of NAWCs Threat Signal Processing-in-the-loop/digital scene injection (TSPIL/DSI and TTCP anti-ship missile engagement models, MCSOFT Upgrade (ground-to-ground), MV-22

Other:

- TTCP, G-17 (NATO Panel), Special Working Group-4 (SWG-4 (NATO Panel)), additionally, insight for CM implications of evolving programs, identified by the Service Acquisition Executives Office, will be provided to the appropriate Program Executive Office/ Program Manager (PEO/PM), Roving Sands 2000

- Threat Systems:

Simulators

- Execute the DoD validation program for threat simulators and threat digital models.
- Continue management and oversight over Service threat simulators and threat digital models.
- Continue threat support to test and evaluation by investigations of current scientific and technical development for insertion in Service threat representation programs (e.g., Advanced system endgame methodologies).
- Continue cooperative technical research and test bed projects to facilitate threat representation (e.g., Air-to-Air Missile Miss Distance Correlation).
- Update the Automated Threat System Handbook to maintain inventory of threat representative assets available for T&E.

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Targets

- Continue management and oversight over Service threat representative targets.
- Provide OSD seed funds to prototype solutions to highest priority deficiencies in current target systems.
- Support the development of new target modeling and simulation capabilities/tools that meet multi-Service T&E needs within common/DoD standard architecture (e.g., BQM-34S Harpoon integration, target electronic countermeasures miniaturization, common digital architecture implementation, super MQM flight performance, decoy countermeasures, low earth orbit target control, and aerial target IR enhancement).
- Provide oversight of Service activities in support of the DoD validation program for Service threat representative targets.
- Continue cooperative technical research to address shortfalls identified within the target validation program.

JTCG/AS

- Initiate MANPADS ad hoc committee.
- Initiate MANPADS projects on vulnerability reduction in response to BAA.
- Develop MANPADS integrated long-range plan of action.
- Initiate MANPADS JT&E.
- Initiate efforts to become a Joint Program Office (JPO).
- Continue legacy model credibility assessments; develop transition strategies from legacy model to HLA and JMASS objects.
- Begin applying lessons learned to Spacecraft vulnerability.
- Develop robust mission level survivability analysis capability.
- Release the Advanced Joint Effort Model (AJEM), a physics based vulnerability, lethality and end game simulation.
- Along with JTCG/ME, continue to populate the component vulnerability archive.
- Continue development of advanced ullage and dry bay protection systems.
- Continue research into thermal energy management techniques on aircraft.
- Continue development of ways to reduce vulnerability of engine vectored thrust nozzles.
- Continue development of degradable chaff, and monobit multisignal instantaneous frequency measurement for threat missiles.
- Complete development and ground test of an engine Active Core Exhaust (ACE) modification to modify IR signature.
- Continue development of dual mode (RF and IR) seeker countermeasures.
- Transition technology development of active engine exhaust to a technology transfer program (TTP).
- Complete development of two color focal plane array readout for missile warning systems, integrated on-board and off-board infrared countermeasures.
- Use fuze investigation results to develop fuze modules that are compatible with current and future vulnerability and endgame simulations.
- Complete research into development of capability for in-flight controls reconfiguration due to battle damage.
- Complete work toward development of advanced transparent armor systems for aircraft windshields and rotorcraft fragment barriers.
- Complete phase development of model for Hydrodynamic Ram phenomenon and reduced vulnerability techniques for engine hot exhaust structures.

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- Continue development of bio- & functional-degradable chaff that can be used for training.
- Continue development of software methodologies and system hardware to evaluate monobit multisignal instantaneous frequency measurement; defining technology development to counter dual mode RF and Imaging IR seekers.
- Initiate work on evaluating steered agile laser beams for CM, network centric RF jamming and setting up for a flight test to evaluate effects of adjusting engine thrust on signature.

- JTCG/ME

- Continue conversion/updates of existing JMEMS to CD-ROM format (i.e., JMEM Air-to-Surface Weaponeering System (JAWS) v2.1, WinJMEM v3.0, Joint Antiair Combat Effectiveness – Air Superiority (JACE-AS) v2.0, Joint Antiair Combat Effectiveness – Ship Antiair Warfare (JACE-Ship AAW) Beta version, JMEM/Surface-to-Surface Weaponeering Effectiveness System (JWES) v1.0, and Target Vulnerability Manual v3.x on JAWS).
- Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) v1.0 (Books-on-line, Automated products, Models, Tri-Service Data, and Support service).
- Continue expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 16, and Surface-to-Surface Direct/Indirect Fire).
- Continue execution and technical coordination efforts to address Target Vulnerability data generation (e.g. Special Operations and small boat targets) and methodology improvements (e.g., buildings and content, rock penetration, agent release model, fragment penetration equation standardization, and ORCA extension).
- Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., Joint Antiair Model (JAAM) v2.0, delivery accuracy, building collateral damage, search/target acquisition, hardened targets, safe distances/risk to friendly troops, and Mean Area Effectiveness standardization).
- Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., Air Target Geometries, BEAMS, ORCA, PENCVR3D, ASAP, AJEM, MEVA-GF, BAS, JSWM, JAAM, ARTQUIK, SAMSITE, and NGEM).
- Together with JTCG/AS, release Advanced Joint Effectiveness Model (AJEM) v1.0 (with features including TBM Body-to-Body, Explosive Initiation, Hydrodynamic Ram, and Blast/Frag Combined Effects), and Joint Component Vulnerability Archive v1.0.

- DESA:

- Fund buyouts to bring AFOTEC back within their QDR target.

T&E Independent Activities

- DOT&E Major Range and Test Facility Base (MRTFB) Responsibilities

To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor

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personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
- Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
- Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
- Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
- Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.
- **DOT&E Modeling and Simulation (M&S) Responsibilities**

Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.
- DOT&E administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.
- **DOT&E Policy and Guidance Analysis**
 - DOT&E administers policy guidance and analysis, impact reviews of correspondence from Executive, Legislative, and DoD sources, and their impact on the DOT&E mission.
 - Provide engineering consultation support at the program manager level in the areas of business process reengineering, requirements analysis, studies, strategic and action planning, performance measures and indicators, and others.
 - Development of strategic planning concepts and approaches
 - Analysis of capabilities, requirements, processes, and partnering opportunities
 - Special study support in planning and analysis; developing basic concepts, strategies and approaches; and developing executive decision models
- **Defense Test and Evaluation Professional Institute (DTEPI)**
 - Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges

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- Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
- Complete training course Modeling and Simulation in Test and Evaluation
- Development of WEB-based Just-in-Time Information on:
 - Early Operational Assessment course
 - Design of Experiments course
 - Live Fire Testing primer
 - Effectiveness and Suitability introduction
 - Environmental Issues Overview
- **Accomplishments for the assessment of the developmental testing of weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

FY 2001 Plans:

JT&E Programs

- **Accomplishments and funds for the JT&E program are now in the Defense-wide RDT&E appropriation (0400) in PE 0605804D.**

T & E Programs

- PGWCM will test, analyze, and report on 20-25 US and foreign PGW systems/components in a countermeasure environment, as well as CM and threat warning systems as listed below by Component:
 - Air Force:
 - P-LOCAAS, SFW, ABL, JASSM, Enhanced LGB (ELGB), ADW
 - Army:
 - BAT P3I, Javelin, SIIRCM/CMWS, PGMM, Longbow P3I, Unmanned Aerial Vehicle (UAV), Multi-spectral CM (MSCM), XM-982
 - Navy/Marines:
 - BISTEM, EWAT, LWRS, NRL-LWR, MV-22, TADIRCM, Extended Range Guided Munition (ERGM), Joint Stand-Off Weapon (JSOW), F/A-18 Night Attack System (NAS), Standoff Land Attack Missile-Automatic Target Acquisition (SLAM-ATA), AAR-47/LWR, Advanced Amphibious Assault Vehicle (AAAV), Roving Sands 2000, Multi-Spectral Countermeasures (MSCM)
 - Foreign:
 - Laser Beam Rider (LBR), Precision Guided Munition (PGM), Active Protection System (APS)
 - M&S:
 - MCSOFT Upgrade(starring array models)
 - Other:

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- TTCP, G-17, SWG-4, CINC Joint training (Ulchi Focus Lens), Roving Sands, additionally, insight for CM implications of evolving programs, identified by the Service Acquisition Executives Office, will be provided to the appropriate Program Executive Office/ Program Manager (PEO/PM)
- Threat Systems
 - Simulators
 - Execute the DoD validation program for threat simulators and threat digital models.
 - Continue management and oversight over Service threat simulators and threat digital models.
 - Continue threat support to T&E by investigations of current scientific and technical developments for insertion in Service threat representation programs (e.g., broadband tactical laser illuminator, differential SAMs and external target coordinates, and Upgrade to Advanced RF SAM).
 - Continue cooperative technical research and test bed projects to facilitate threat representation (e.g., air-to-air missile on a mountain, threat modeling and simulation test bed, intelligent threat entity development, MATLAB/simulink air-to-air missile modeling, and re-engineered software for tactical RF SAM).
 - Update the Automated Threat Systems Handbook to maintain inventory of threat representative assets available for the T&E community.
 - Targets
 - Continue management and oversight over Service threat representative targets.
 - Provide OSD seed funds to prototype solution to highest priority deficiencies in current target systems.
 - Support the development of new target modeling and simulation capabilities /tools that meet multi-Service T&E needs within common/DoD standard architectures (e.g., radar variations, conformal array antennas for targets, aerial target IR enhancement, aerial target modeling, common digital architecture implementation, and low earth orbit target control system).
 - Provide oversight of the Service activities in support of the DoD validation program for Service threat representative targets.
- JTCG/AS
 - Initiate MANPADS coordinated database development.
 - Initiate MANPADS coordinated methodology prediction and assessment efforts.
 - Initiate MANPADS coordinated vulnerability and susceptibility reduction technique development.
 - Begin RF & High Power Microwave (HPM) weapons vulnerability reduction efforts.
 - Transition to full JPO status.
 - Begin unmanned air vehicle vulnerability determination/reduction.
 - Analyze aircraft armor attachment qualification techniques and advance armor concepts.
 - Analyze improvements to advanced composite materials manufacturing techniques including thermoplastic, thermosets and bonding of joints.
 - Analyze rotorcraft reconfigurable flight control systems and integrated flight/propulsion control.
 - Continue development and integration of physics-based damage algorithms into AJEM.
 - Conduct dry bay parameter sensitivity study.
 - Continue development of countermeasure techniques for new modes of seeker technology.

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- Continue transition to JMASS objects, mission effectiveness modeling, links to cost model and model credibility enhancements.
 - Complete development of advanced ullage and dry bay protection systems.
 - Complete development of degradable chaff, and monobit multisignal instantaneous frequency measurement.
 - Complete development of imaging missile IR countermeasures, dual mode (RF and IR) seeker countermeasures.
 - Complete research into thermal energy management techniques on aircraft.
 - Complete development of ways to reduce vulnerability of engine vectored thrust nozzles.
- JTCG/ME
- Continue conversion/updates of existing JMEMs to CD-ROM format (i.e., JMEM Air-to-Surface Weaponing System (JAWS) v3.0, WinJMEM v4.0, Joint Antiair Combat Effectiveness – Air Defense (JACE-AD) v1.x, JMEM/Surface-to-Surface Weaponing Effectiveness System (JWES) v1.x, and Target Vulnerability Manual v4.0 on JAWS).
 - Distribute products via the classified internet with the Joint Product and Information Access System (JPIAS) v2.0 (Books-on-line, Automated products, Models, Tri-Service Data, and Support service).
 - Continue expansion of existing databases to incorporate data for newly fielded weapons (i.e., Air-to-Surface Basic Manual – change 17, and Surface-to-Surface Direct/Indirect Fire).
 - Continue execution and technical coordination efforts to address Target Vulnerability data generation (e.g., Special Operations) and methodology improvements (e.g., counter proliferation, fragment penetration, ORCA extension, and target model generation).
 - Continue the development of standardized models and methodology for Air-to-Surface, Surface-to-Surface and Antiair effectiveness calculations (i.e., collateral damage, hardened targets, and dual stage warheads).
 - Conduct Configuration Management/VV&A efforts on specific JTCG/ME models (i.e., AJEM, MEVA, MUVES, and ASAP).
 - Together with the JTCG/AS, release Advanced Joint Effectiveness Model (AJEM) v2.x (Generalized Body-to-Body and Internal Blast), and Joint Component Vulnerability Archive v1.x.

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T&E Independent Activities

- DOT&E Major Range and Test Facility Base (MRTFB) Responsibilities

To support its T&E functions, including: research; weapon system development; survivability enhancements; production and modification testing; depot maintenance testing; operational training and exercises; aging and surveillance testing; foreign military sales; and commercial use, DoD creates, operates, and maintains, complex, technically sophisticated, facilities. Collectively, these facilities are known as the Major Range and Test Facilities Bases (MRTFB). The MRTFB encompasses 21,000 square miles of land, 243,000 square miles of water surface, and 221,000 square miles of air space and represents a capital investment of close to \$30 billion while employing close to 55,000 military, government civilian, and contractor personnel. These facilities are supported by a current annual institutional funding of approximately \$1.2 billion and customer reimbursements of about \$1.5 billion. The Department invests about \$500 million each year in their re-capitalization and modernization.

- Establish policy for the MRTFB, including composition, use, and test program assignment;
- Monitor and evaluate the MRTFB to ensure adequacy to meet requirements and to prevent unnecessary duplication of capabilities;
- Alter the composition of the MRTFB, if necessary, in coordination with the applicable DoD Component;
- Develop and issue a summary and database of MRTFB capabilities in coordination with the Military Departments; and,
- Plan, program, and budget for the Central Test and Evaluation Investment Program to fund high priority and critical multi-service test and evaluation investment programs.

- DOT&E Modeling and Simulation (M&S) Responsibilities

Models and simulations are tools that can be used to support the program manager in each phase of the acquisition process. M&S is the application of those tools to early program support decisions. It is an efficient and effective source of valuable information to be used in the development and evaluation of new defense systems. M&S can aid in minimizing risks to cost, schedule, performance and supportability. In an accredited and integrated manner, M&S can reduce the expenditure of resources, accelerate understanding through early insight, and shorten overall cycle time. At the same time, M&S improves the decision making quality of the system under development. Implementing state-of-the-art M&S for planning, design, analysis, management, and testing can significantly improve the effectiveness of the Integrated Product and Process Development (IPPD) management technique. It is DoD and OT&E policy that models and simulations shall be used early in the T&E process whenever feasible so as to reduce the time, resources, and risks of the acquisition process and to increase the quality of the systems being acquired. Representations of proposed systems (virtual prototypes) shall be embedded in realistic, synthetic environments to support the various phases of the acquisition process, from requirements determination and initial concept exploration to the manufacturing and testing of new systems, and related training.

- DOT&E administers all program matters pertaining to M&S and provides oversight of the development and use of models and simulations.

- DOT&E Policy and Guidance Analysis

- DOT&E administers policy guidance and analysis, impact reviews of correspondence from Executive, Legislative, and DoD sources, and their impact on the DOT&E mission.
- Provide engineering consultation support at the program manager level in the areas of business process reengineering, requirements analysis, studies, strategic and action planning, performance measures and indicators, and others.
 - Development of strategic planning concepts and approaches
 - Analysis of capabilities, requirements, processes, and partnering opportunities

R-1 Shopping List – Item No 4 - 13 of 15

Exhibit R-2, RDT&E Budget item Justification

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- Special study support in planning and analysis; developing basic concepts, strategies and approaches; and developing executive decision models
- Defense Test and Evaluation Professional Institute (DTEPI)
 - Chartered by DOT&E to operate as an arm of the U.S. Army, Navy, Air Force for training and study of T&E as applied to weapons systems, subsystems, and related devices
 - Provide career development, training, and recognition for DoD T&E professionals
 - Serve as a forum for enhancement of the T&E process to meet future challenges
 - Primary site for the conduct of seminars, conferences, and symposia for all aspects of T&E including weapon system unique requirements, as well as ranges, facilities, and related subjects
 - Develop training course on following proposed topics:
 - International Test & Evaluation
 - Interoperability Test & Evaluation
 - Environmental Issues for Executives
 -
- **Funds for these activities are in the D,OT&E (0460) appropriation, PE 0605804D.**
- **Accomplishments and funds for the assessment of the developmental testing of weapons systems are now in the Defense-wide RDT&E (0400) appropriation in PE 0605804D.**

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B. (U) PROGRAM CHANGE SUMMARY

(\$ in Millions)	<u>FY 1999*</u>	<u>FY 2000*</u>	<u>FY 2001</u>
FY 2000 President's Budget	94.253	99.840	99.633
Appropriated Value	94.253		
Adjustments to Appropriated Value			
Joint Test and Evaluation Realigned to Defense-wide RDT&E (0400) Appropriation			(46.120)
Nonpay Purchase Inflation Adjustment			(238)
Current Budget Submit	94.253	99.840	53.275

C. (U) OTHER PROGRAM FUNDING SUMMARY: NA