Fiscal Year (FY) 2005 Budget Estimates RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE FEBRUARY 2004	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense Wide/BA 3 R-1 ITEM NOMENCLATURE			**Quick Reaction Special Projects (QRSP) PE 0603826D8Z**					
COST *(In Millions)*	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	
Total Program Element (PE) Cost	24.076	46.566	64.389	89.927	90.408	92.111	94.143	
Quick Reaction Fund Project P826	6.019	15.522	21.463	29.975	30.136	30.703	31.381	
Defense Acquisition Challenge Program Project P827	12.038	17.793	21.463	29.976	30.136	30.704	31.381	
Technology Transition Initiative Project P829	6.019	13.251	21.463	29.976	30.136	30.704	31.381	

(U) A. Mission Description and Budget Item Justification

(U)The Quick Reaction Special Projects Program (Program Element 0603826) QRSP supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter: Quick Reaction Funding (QRF), Technology Transition Initiative (TTI), and Defense Acquisition Challenge (DAC). The Quick Reaction Special Projects (QRSP) program was a new start beginning in FY 2003 and is used to initiate high-priority science and technology projects in the execution year. QRSP provides the flexibility to respond to emergent DoD issues and address technology surprises and needs within the year of execution outside the two-year budget cycle. The DAC and TTI are mandated by Congress and receive high congressional interest. These programs have been very successful in finding projects to solve real time problems.

(U)The Quick Reaction Fund (QRF) program is focused on responding to emergent needs within the budget execution year cycle as well as taking advantage of technology breakthroughs in rapidly evolving technologies. Examples of the types of projects that are envisioned include: accelerating promising research that will enable transformation; or will fill critical gaps in DoD acquisition programs and will last no longer than 12 months; or maturation of technologies is critically needed by combatant commanders for operations. Typically these projects are on the technology maturity scale where an idea or technology opportunity is proved out and demonstrated. In FY 2003, 130 proposals were reviewed and six projects were funded, three of which are in use, or has been used in Iraq.

(U) The Defense Acquisition Challenge Program was authorized by Title 10, Section 216 of the Defense Authorization Act and provides increased opportunities to insert innovative and cost-saving technologies into formal acquisition programs of the Department of Defense. The program funds the test and evaluation of technologies and products that have the potential to improve performance, affordability, manufacturability, or operational capability of current acquisition programs. In FY 2003, the DAC selected twenty-two projects for funding from over 300 proposals submitted by industry and DoD program mangers.

(U)The Technology Transition Initiative addresses the funding gaps that exist between the time a technology is demonstrated and the time it is procured for use in an intended weapons system. The Technology Transition Initiative was authorized under Title 10, Section 215 of the Defense Authorization Act to facilitiate the rapid transition of new technologies from S&T into acquisition programs. The initiative's objectives are to accelerate the introduction of new technologies into operational capabilities for the armed forces. In FY 2003, TTI selected thirteen projects from the Services based on recommendations from the AT&L Technology Transition Council, made up of members from the Joint Requirements Oversight Council, and Acquisition Executives and Science and Technology Executives from each military department and each Defense Agency.

B. Program Change Summary:

	FY 2003	FY 2004	FY 2005
Previous President's Budget	24.572	74.383	99.513
Current FY 2005 President's Budget	24.076	46.566	64.389
Total Adjustments	-.496	-27.817	-35.124
Congressional program reductions		-18.000	
Congressional rescissions			
Congressional increases			
Reprogrammings			
SBIR/STTR Transfer			
Other	-.496	-9.817	-35.124

Fiscal Year (FY) 2005 Budget Estimates Exhibit R-2a, RDT&E Project Justification							Date: FEBRUARY 2004	
Appropriation/Budget Activity Defense Wide RDT&E (0400) Budget Activity 3				**R-1 ITEM NOMENCLATURE** PE 0603826D8Z Quick Reaction Special Projects **Project P826 Quick Reaction Fund (QRF)**				
Cost ($ in millions)	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	
Total Program Element	24.076	46.566	64.389	89.927	90.408	92.111	94.143	
Quick Reaction Fund Project P826	**6.019**	**15.522**	**21.463**	**29.975**	**30.136**	**30.703**	**31.381**	
Defense Acquisition Challenge Program P827	12.038	17.793	21.463	29.976	30.136	30.704	31.381	
Transition Initiative P829	6.019	13.251	21.463	29.976	30.136	30.704	31.381	

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Quick Reaction Special Projects (QRSP) program supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter: Quick Reaction Funding (QRF), Technology Transition Initiative (TTI), and Defense Acquisition Challenge (DACP). The fiscal controls above represent an approximate investment of the Quick Reaction Funding.

The Quick Reaction Fund (QRF) provides flexibility to respond to emergent warfighter needs within the budget cycle. It takes advantage of technology breakthroughs in rapidly evolving technologies with completion within a 6-12 month period.

B. (U) Accomplishments/Planned Program

(U) FY 2003 Accomplishments: Quick Reaction Fund

FY 2003 was the first year for the Quick Reaction Fund. A limited data call was released on January 23, 2003 requesting proposals in response to emergent operational needs and to capitalize on emerging technologies. The call was limited due to the small dollar value

in FY 2003. Candidate proposals were focused in the areas of technology required to reduce the unanticipated risk in acquisition programs, technology opportunities in rapidly evolving disciplines or technology maturation opportunities to support realtime operational needs. Each proposal addressed the description of the technology/concept, description of any demonstration testing required, description of technical, funding, schedule and risk, proposed executing Service/Agency and User. The proposals were reviewed for technical and warfighter relevance review. Projects awarded with FY 2003 funding were the Thermobaric Hellfire munitions, and the Dragon Eye chemical and biological sensor UAV, both of which were successfully used in Iraq and Afghanistan. Other projects were the Guidance Integrated Fuze, the Low-Cost Guided Imaging Rocket and MANPADs Part 2. Below is more in-depth discussion of each of the projects.

	Service/Agency	FY 2003	FY 2004	FY 2005
Gryphon	Army	1.5	0	0

The Gryphon is an unmanned aerial vehicle made from special materials which make it resistant to destruction. Details are at the secret level.

FY 2003 Accomplishments: The Gryphon project completed flight testing at Yuma on December 4, 2003. The project was successfully tested and met all objectives.

FY 2004 Plans: A briefing to the PD(USD)AT&L is scheduled for January 20, 2004. Future plans, including funding needs, will be discussed at that time. There are currently no plans from the QRF to fund this project in FY 2004.

	Service/Agency	FY 2003	FY 2004	FY 2005
Dragon Eye Sensor Integration	Navy	.800	0	0

The Dragon Eye is a small unmanned aerial vehicle. QRF funding was used to expedite technology development, scale-up the technology and complete prototyping of integrating chemical and biological sensors into the existing Dragon Eye UAV.

FY 2003 Accomplishments: Four Dragon Eye UAV systems with the associated Ground Station and computers were used by Special Forces in Operation Iraqi Freedom. All prototyping including integration of the chemical-biological nose cones into twelve UAV systems was completed with field testing in July 2003. Live agents were used which fully tested the sensor/collection system. After action reports from the Marine Corps and other users validated the utility of this capability for providing reconnaissance for force protection and intelligence

FY 2004 Plans: There are currently no plans to fund this project from the QRF in FY 2004.

	Service/Agency	FY 2003	FY 2004	FY 2005
Guidance Integrated Fuze	Navy	1.0	0	0

The Guidance Integrated Fuze (GIF) is a low cost fuze that replaces a NATO standard fuze on existing stockpiles and reduces the number of rounds need to defeat targets by a ratio of 20 to 1. The system is uses COTS based power, telemetry, sensor, flight processor, actuator and nose roll bearing systems.

FY 2003 Accomplishments: Completed initial fuze design. Completed 4 roll bearing test fuze gun firings. This verification testing was important to prove that the COTS based components could survive gun launch. Static wind tunnel testing was completed in September 2003.

FY 2004 Plans: Seven flight tests are planned. Based on the success of that test, a contract award is planned for the development of miniature M-code GPS receivers, which is funded outside the QRF work. The Army and Navy have both planed to procure these

fuzes beginning in FY 2006. There are currently no plans to fund this project in FY 2004 from the FY 2004 QRF.

	Service/Agency	FY 2003	FY 2004	FY 2005
Low Cost Guided Imaging Rocket	Navy	1.0	0	0

The Low Cost Guided Imaging Rocket (LOGIR) is a prototyping effort to provide a low cost guidance technology to existing weapon systems including the 2.75" rocket. The LOGIR integrates an image based accuracy enhancement kit onto the existing Hydra 70 rocket with a helicopter. The helicopter targeting systems locks onto the target and sends that information to the rocket. The helicopter does not have to point to the target or be exposed during weapon fly-out. This same concept will work for UAVs, and other weapons and platforms.

FY 2003 Accomplishments: The majority of the program was funded by the Navy. QRF was used to fund testing. Testing of round 1 demonstrated that the Hydra 70could be controlled by adding a control actuator system and an auto flight computer and was completed successfully in November 2003. Round 2 testing is scheduled for early FY 2004 and will demonstrate the ability to acquire a target during terminal flight.

FY 2004 Plans: Flight testing is continuing of this project thought FY 2004 with one more flight test. Based on the success of the guided flight test, the Navy will make a decision on whether to include this procurement in POM 2006. There are currently no plans to fund this project from QRF in FY 2004.

	Service/Agency	FY 2003	FY 2004	FY 2005
WMD Intelligence Processing – Rapid Targeting System	DITRA	1.0	0	0

The WMD Intelligence Processing – Rapid Targeting System (RTS) is a web portal implementation of various intelligence information to allow theater-planning for the Combatant Commanders. Currently, Theater planners, component analysts and national agencies use multiple web portals, many stove-piped with limited interoperability, to monitor, exploit and interdict mobile missile launchers and associated deployments. Integrating multiple portals into a single system decreases analyst workload while

improving WMD target analysis.

FY 2003 Accomplishments: Key participants from the Joint staff, Combatant Commanders, DTRA, DIA and DOE refined the requirements in December 2002 and designed the architecture in January 2003. The interface, con-ops and User Interface were developed by April 2003 with final Beta testing in May. The initial design was delivered in July 2003

FY 2004 Plans: There are currently no plans to fund this project from QRF funds in FY 2004.

	Service/Agency	FY 2003	FY 2004	FY 2005
Thermobaric Warhead Integration	Army	.479	0	0

The thermobaric area clearing munition was developed under an ACTD. The munition consists of casing, sensors for detecting enemy presence, two-way communication and specially designed thermo baric material. The system neutralizes the enemy traffic inside cave complexes without harming the cave structure. Integration of this warhead with the hellfire was completed with QRF funding in FY 2003.

FY 2003 Accomplishments: Integration of the thermobaric warhead with the Hellfire missile was completed and the system was deployed for use in Iraq.

FY 2004 Plans: There are currently no plans to fund this project in FY 2004 from the QRF funds. The hellfire thermobaric system is undergoing a formal test program for deployment to the Army and Marine Corps.

	Service/Agency	FY 2003	FY 2004	FY 2005
MANPADs Part 2	Navy	.240	0	0

(U) FY 2003 Accomplishments: During the period of August to December 2003, completion of support to OSD AR&L on efforts resulting from the MANPADS study in preparation for the FY 2004 start of PLATO ACTD. This included a continued analysis and coordination of

MANPADS defense issues across the service program offices and S&T community which developed a coherent IRCM strategy. Work with transition sponsors was conducted for the Implementation Directive and Management Plan for the PLATO ACTD. This addressed planning for several efforts included in the ACTD; development and intergration of laser IRCM into a pod. Detailed planning for IR signature measurement and engagement modeling and common IRCM interface was development.

FY 2004 Plans: There are currently no plans to fund this project in FY 2004.

	Service/Agency	FY 2003	FY 2004	FY 2005
Quick Reaction Fund (QRF)		0	15.522	21.463

(U) FY 2003 Accomplishments listed above…

(U) FY 2004 Plans: Quick Reaction Fund
Beginning in FY 2004 the data call was expanded to the Combatant Commanders, Service Acquisition Executives and Defense Agencies with a request for top ten projects to be submitted. The evaluation and technical/warfighter relevance reviews will remain the same. While proposals will be accepted at any time during the year with a goal of reviewing them within 45 days, the first call for proposals was in late November for the 2004 candidates. Over 100 proposals were received and are under review by technical experts and the Joint staff. In addition, projects found critical enough during the FY 2003 evaluation process may be considered to be candidates for FY 2004 funding. DDR&E will be the final decision authority and notify the USD (AT&L) of each proposal selected.

(U) FY 2005 Plans: Quick Reaction Fund
The project will operate similar to FY 2004 with incorporation of any lessons learned. Many of the projects selected in the FY 2004 support force protection initiatives in response to countering the Improvised Explosive Devices threat in Iraq, which may not be required in FY 2005.

(U) Other Program Funding Summary: N/A

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2a Exhibit)								DATE February 2004	
APPROPRIATION/BUDGET ACTIVITY Defense Wide RDT&E (0400) Budget Activity Three					R-1 ITEM NOMENCLATURE Quick Reaction Special Projects/**Defense Acquisition Challenge Program** **PE 0603826D8Z P827**				
COST *(In Millions)*	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	Cost to Complete	Total Cost
Total Program Element	24.076	46.566	64.389	89.927	90.408	92.111	94.143		
(DACP P827)	**12.038**	**15.522**	**21.463**	**29.976**	**30.136**	**30.704**	**31.381**	Continue	Continue

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Quick Reaction Special Projects Program (Program Element 0603826) has three sub-elements: Defense Acquisition Challenge Program (DACP), Technology Transition Initiative (TTI) and Quick Reaction Special Projects (QRSP).

Authorized by Title 10, Section 2395b, the Defense Acquisition Challenge Program (DACP) provides increased opportunities to insert innovative and cost-saving technologies into acquisition programs of the Department of Defense. DACP funds the test and evaluation of technologies and products that have the potential to improve performance, affordability, manufacturability, or operational capability of current acquisition programs at the component, subcomponent, or system level.

As a result of the Defense Acquisition Challenge Program's rapid establishment in mid-FY 2003, the Comparative Testing Office and its Foreign Comparative Testing (FCT) Program were selected by AT&L as the infrastructure to support the DACP pilot business model. Currently, U.S. Special Forces Command, U.S. Army, U.S. Marine Corp, and the Navy's Naval Sea Systems Command, Naval Air Systems Command, and Naval Space and Naval Warfare Systems Command are supporting DACP with the current FCT service infrastructure. The U.S. Air Force and the remainder of the U.S. Navy have not decided how to support DACP.

The DACP pilot business model leverages off the successful FCT personnel and business processes where possible except OSD DACP will issue a Broad Agency Announcement (BAA) annually inviting interested parties to submit summary proposals. As a result of DACP's

rapid establishment in 2nd Quarter FY 2003, the FY 2003 BAA served as the only call for proposals in FY 2003 and FY 2004. The FY 2005 cycle will begin with a BAA in early CY 2004.

More than 300 summary proposals were submitted during Phase I by industry and government representatives in response to the March 2003 BAA. Approximately one third of the proposals were rejected during an administrative review for lack of proper documentation. The remaining proposals were prioritized for potential benefit to Program of Records (POR). Nearly 125 Program Managers were contacted during Phase II and asked to consider proposed technologies for use within their program. Program managers from all Services and USSOCOM submitted more than 80 final proposals, covering a broad range of technologies, to compete for FY 2003 and FY 2004 new start funding. Twenty proposals were selected for FY 2003 new start funding. An additional eight proposals were selected for FY 2004 new start funding.

The DACP process is a two-phased annual process. During Phase I, interested parties, within and outside the DoD, are invited through a BAA to submit summary proposals. Summary proposals are evaluated and prioritized based on merit and their potential to benefit a DoD POR. In Phase II, candidate summary proposals are matched to the PORs that have the potential to benefit from the proposed technology. POR Program managers, in collaboration with the weapon prime where applicable, evaluate and either "accept" or "reject" the proposed technology. A "reject" is defined as the POR has determined that the technology can not benefit the POR. An "accepts" is defined as the POR determines the technology has potential benefit and wishes to compete for funding. The POR then develops a final proposal to compete for DACP funding to test and evaluate the proposed technology. The final proposal contains a brief description of the issue and how the proposed technology resolves the issue, test and evaluation strategy, and procurement and transition strategy if the technology meets the PORs requirements. Final proposals are submitted into OSD DACP by the POR where the proposals are evaluated and prioritized, and selected for funding by the OSD DACP Program Manager.

The fiscal controls above represent an approximate investment of the Quick Reaction Special Projects Program funding for the Defense Acquisition Challenge Program effort.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

	Service	FY 2003	FY 2004	FY 2005
Portable Continuity of Operations Communication Appliance	Army	0.549	0.765	0

This project will evaluate the capability of Web Assured Response Protocol (WARP) to provide disaster recovery and continuity of operations (COOP) solutions to the U.S. government. WARP, if successful, will provide a solution to enable users to continue to perform vital IP-based functions over damaged or overloaded networks. This capability is vital in Continuity of Operations environments. This is extremely critical during periods of emergencies, such as terrorist attack, severe weather, etc.

Vendor: Circadence Corporation, Boulder, CO
Program Office of Record: Army Chief Information Officer/DoD COOP Integrated Network (DCIN)

FY 2003 Accomplishments: Project approval. Initiate: management/measurement design; network configuration/automation; WARP configuration/automation.
FY 2004 Plans: Complete the above. Conduct training. Conduct testing and evaluation. Prepare/finalize final report.

	Service	FY 2003	FY 2004	FY 2005
Transcritical CO2 Environmental Control System	Army	0.154	0.366	0.300

This project will evaluate CO_2 technologies (refrigerant, compressors, and condensers) for insertion into the Up-Armored HMMWV program as logistics improvements, and provide cooling and heating. If successful, CO_2 technologies will replace current environmentally-harmful synthetic refrigerants and systems with smaller size, weight and improved efficiency systems which are vital to the legacy fleet, the Future Tactical Truck System (FTTS), and the Future Combat System (FCS). This is extremely critical for the US Army to meet international environmental protocols, in order to allow it to operate worldwide in several different countries.

Vendor: Modine Manufacturing, Harrodsburg, Kentucky
Program Office of Record: Army PM-Light Tactical Vehicles (LTV), PEO Combat Support & Combat Service Support (CS/CSS)

FY 2003 Accomplishments: Project approval. System integration.
FY 2004 Plans: Conduct/complete/report Phases I and II testing/evaluation.
FY 2005 Plans: Conduct/complete/report Phase III testing/evaluation. IPR decision.

	Service	FY 2003	FY 2004	FY 2005
Mini Combat Trauma Patient Simulation System	Army	0.195	0.368	0

This project will evaluate a newly developed low cost, physiologically modeled Emergency Care Simulator (ECS™) that can provide a military medical simulation system for training, test and evaluation. The ECS in a Mini CTPS configuration will enhance portability, affordability and ease of deployment with active forces. It is hoped that training on this system will lead to more quick and realistic assessments of battlefield casualties, thus greatly increasing Soldier survivability.

Vendor: Medical Education Technologies, Inc. (METI), Sarasota, FL
Program Office of Record: Army PEO Simulation, Training and Instrumentation (PEO STRI)

FY 2003 Accomplishments: Project approval. Contract preparation and award.
FY 2004 Plans: Conduct/complete/report technical/operational testing/evaluation. IPR decision. Production buys.

	Service	FY 2003	FY 2004	FY 2005
Dismounted Infantry Virtual Simulation for Military Operations in Urban Terrain	Army	0.478	0.651	0.150

This project will evaluate a virtual training system that if successful will lay the foundation for rapid technology insertion into three major acquisition programs: (1) Integrated MOU Training System (I-MTS); (2) Virtual Emergency Response Training System (VERTS); and (3) Soldier Combined Arms Tactical Trainer (Soldier CATT). This dual use technology can be used to immerse a war fighter or emergency responder into a networked simulation, providing a training capability for homeland security, urban operations, and Weapons of Mass Destruction (WMD) detection. This capability is critical due to the ever increasing scarcity of real-life training resources, such as time, space (terrain), and funding.

Vendor: Advanced Integrated Systems, Reality By Design, Orlando, FL
Program Office of Record: Army PEO Simulation, Training and Instrumentation (PEO STRI)

FY 2003 Accomplishments: Project approval. Complete contract preparation and award.
FY 2004 Plans: MOUT site acquisition. System modifications/integration. Conduct and complete technical testing and limited user testing and evaluation.
FY 2005 Plans: Complete final evaluation reports. IPR decision to support production buys. Production buys.

	Service	FY 2003	FY 2004	FY 2005
New Secure Version of Army Wireless Intercommunication System	Army	0.820	0.863	0

This project will evaluate a secure wireless intercom system for close range communications capability for aviation operations. Current unencrypted communication systems can compromise security. This technology has the potential to decrease risk of mission compromise, increase mission effectiveness and soldier safety, and achieves ORD objectives by eliminating interception of communication between aircrews and ground stations. This technology is an excellent candidate for horizontal technology insertion with joint service application.

Vendor: Telephonics Corporation, Communication Systems Division, Farmingdale, NY
Program Office of Record: Army PEO Soldier/PM Air Warrior

FY 2003 Accomplishments: Project approval.
FY 2004 Plans: Contract prep/award. Conduct software incorporation into communication devices and platform installation. Test and evaluation, reporting conducted and completed. Training/tech data packages delivered. Production decision/buys.

	Service	FY 2003	FY 2004	FY 2005
Spray Cool ™ Counter Targeting System (CTS)	Army	1.447	0.105	0.208

This project will evaluate a new technology insertion to enable spiral development of the Counter Targeting System (CTS). CTS utilizes an infra-red (IR) sensor at high frame rates to detect sniper, mortar, RPG, and large caliber weapons fires. This system will assist in near real-time targeting and situational awareness for direct support of combat troops in operations such as Iraq and Afghanistan. If successful, the Spraycool technology will reduce CTS weight of 400+ pounds to less than 100 pounds. First test articles will be field tested in Iraq.

Vendor: Isothermal Systems Research (ISR), Inc., Clarkston, WA
Program Office of Record: Army Intelligence and Security Command

FY 2003 Accomplishments: Project approval.
FY 2004 Plans: Contract prep/award. System development/integration. Conduct/complete qualification testing/evaluation.
FY 2005 Plans: Tactical assessment. Safety release. Final evaluation report. Procurement Decision. Transition plan.

	Service	FY 2003	FY 2004	FY 2005
Enhanced Optical System – Rolling Airframe Missile (RAM)	Navy	1.149	0.322	0

This project will evaluate an alternative optical system to an existing production design that will improve performance, manufacturability, and operational capability while providing several million dollars in cost savings.

Vendor(s): Exotic Materials, Murrieta, CA; Crystal Systems, Salem, MA; Precise Surface Finishing, Murrieta, CA; Dexter Magnetic Technologies, Fremont, CA; Janos Technology, Townshend, VT; Optical Coating Corporation, Natick, MA; Optimum Optical Systems, Inc, Camarillo, CA; Scarrott Metallurgical, Los Angeles, CA; Schmitt Measurements Systems, Inc., Portland, OR; Telic Optics, Inc., North Billerica, MA
Program Office of Record: PEO (IWS3) RAM/CIWS project office

FY 2003 Accomplishments: Subcontracts have been issued to the above vendors for design and fabrication work for a new optical system.

FY 2004 Plans: Deliveries of the new optical components will commence in mid FY 2004. The components will be forwarded to the RAM Prime contractor, for design evaluation, missile incorporation and eventual flight-testing in early FY 2005/2006.

	Service	FY 2003	FY 2004	FY 2005
Ship Hull Inspection and Harbor Security Autonomous Underwater Vehicle	Navy	1.795	0.905	0

This project will evaluate a Ship Hull Inspection and Harbor Security Unmanned Underwater Vehicle (UUV) System, which inspects ship berthing, piers, and ship hulls for explosives or weapons of mass destruction. The system comprises a portable un-tethered UUV with unique inspection sensors and navigation capabilities and support hardware and software, which reduce manpower requirements and risks. If successful, UUVs will result in a 450% increased in search rate and reduce risk to both divers and shipboard platforms.

Vendor: Lockheed Martin Perry Technologies, Riviera Beach, FL
Program Office of Record: PEO Littoral and Mine Warfare (PMS EOD)

FY 2003 Accomplishments: Held initial IPT project meeting. IPT attendees included representatives from Lockheed Martin (vendor), Office of Naval Research, Explosive Ordnance Disposal Technology Division, Space and Naval Warfare, System Center, EOD Mobile Unit Seven (fleet user) and PEO-LMW (PMS-EOD). Agenda items included drafting of contract, development of program exit criteria, operational environment definition and refined plan of action and milestones. Contract was refined and initial submission of contract to SSCSD contracts office.

FY 2004 Plans: Major program FY 2004 milestones included, but are not limited to: 1) Finalize DACP POA&M, 2) Draft and publish project plan, 3) Finalize and gain approval of IPT charter, 4) Hold quarterly IPT meetings, 4) Award contract with Lockheed Martin, 5) Conduct initial User Operational Evaluation with prototype system, 6) DACP UUV system delivery, and 7) Test IAW defined exit criteria.

	Service	FY 2003	FY 2004	FY 2005
Low Cost Aerogel Insulation for Shipboard Fire and Thermal Protection	Navy	0.308	1.265	0

This project will evaluate a flexible aerogel thermal insulating blanket for use on the DD(X). The proposed nano-porous material has the potential to provide a fire barrier protection layer with large weight and volume savings compared with compatible composite and steel structures. The Aerogel Insulation has the potential to provide a thermal barrier, reduced signature and blast mitigation.

Vendor: Aspen Aerogel, Marlborough Massachusetts
Program Office of Record: PM for Auxiliaries, Recoverability and Materials

FY 2003 Accomplishments: Program was initiated in late FY 2003, with program work focused on development of integration strategy for the DD(X) program, including development of FY 2004 test plans and schedules. Additionally, test requirements necessary for shipboard implementation were discussed and identified for the program test plan.

FY 2004 Plans: Design the insulation material to meet the DDX program performance requirements; such as thermal, toxicity and fire protection; Initiate a tiered test and evaluation process of the Aerogel insulation material consisting of both laboratory & prototype testing, including full-scale fire tests.

	Service	FY 2003	FY 2004	FY 2005
WDM Fiber Optic Global Position System Anti-Jam Antenna	Navy	0.451	0.173	0.750

This project will evaluate Wave Division Multiplexing (WDM) technology with shipboard GPS Anti-Jam antenna assembly to determine if it can provide for transmission of multiple RF signals through a single optic fiber. If successful, this project will enable relocation of the GPS antenna electronics from high on the mast to below decks where it is protected and readily accessible for maintenance.

Vendor(s): Gould Fiber Optics, Millersville, MD; Optiwork, Freemont, CA; JDS Uniphase Corp., San Jose, CA; Tempo Research, Camarillo, CA; Fiber-Span LCC, Piscataway, NJ

Program Office of Record: SPAWAR PEO Command, Control, Communications, Computers, and Intelligence and Space (PMW/A-156)

FY 2003 Accomplishments: WDM GAS-1 assembly specification is being conducted to purchase COTS WDM hardware components. The phase one WDM test plan has been developed and is out for technical review. The WDM components list has been sent to the Reliability Assessment Center for a Quick-Look assessment on interoperability.

FY 2004 Plans: An Industry survey of integration vendors will be conducted. A production representative hardware module from each vendor containing the WDM and laser components will be produced and integrated into the GPS anti-jam antenna assembly. A reliability analysis of the production representative antenna assemblies will be conducted. The key performance parameters to be evaluated are GPS system jamming performance use WDM technology, environmental qualification for

high risk area, and shipboard operational test to certify readiness for fleet implementation.

	Service	FY 2003	FY 2004	FY 2005
Mortar Plating System using Vacuum Arc Vapor Deposition (VAVD)Technology	Marine Corps	0.821	0.581	0.275

This project will evaluate this process for plating the interiors of worn 60mm and 81mm mortar tubes that are wearing faster than expected. Specifically this project examines the use of Vacuum Arc Vapor Deposition (VAVD) technology. If this process is successful, the USMC will be able to plate material in worn areas and economically restore the infantry mortar tubes to a serviceable condition, providing a more cost-effective method in restoring the mortars to combat ready status.

Vendor: Alpen Technology Group, Inc., Brownsboro, AL
Program Office of Record: USMC Warfighting Laboratory, Quantico, VA 22134

FY 2003 Accomplishments: Contract prep and award.
FY 2004 Plans: Perform test planning and receive test items (mortar tubes); Mortar tubes plated with *Vacuum Arc Vapor* deposition technology; Initiate technical and operational tests (destructive and non-destructive tests)
FY 2005 Plans: Complete technical and operational tests. Procurement Decision

	Service	FY 2003	FY 2004	FY 2005
Miniature – Controlled Receive Pattern Antenna (MCRPA)	Navy	0.410	1.392	0.384

This project will provide anti-jamming GPS capability to Navy platforms that have size and weight restrictions for antennas, such as the UH-1Y and AH-1Z helicopters and submarines.

Vendor: Titan Corporations, Greenbelt, Maryland
Program Office of Record: PEO C4I, PMW/PMA-169 Navy

FY 2003 Accomplishments: Conducted initial assessment of MCRPA utilization in a submarine mast.
FY 2004 Plans: Finalization of the aperture, feed card and nulling card designs. Prototype fabrication, mechanical ruggedization and systems testing.
FY 2005 Plans: Pre-production fabrication and testing of antenna system.

	Service	FY 2003	FY 2004	FY 2005
Enhanced Gunfire Detection System	USSOCOM	0.513	0.805	

This project will evaluate system enhancements (i.e., addition of sensors and processors) which have the potential to significantly improve the accuracy of the Gunfire Detection System (GDS) and locate a sniper prior to the sniper's first shot. This improved technology will be brought about through the integration of selected sensors (e.g., hyperspectral imagers, unattended ground sensors, visible microsensors, infrared sensors, etc.) in the GDS and through the inclusion of automatic processing software.

Vendor(s): Multiple U.S. Vendors
Program Office of Record: US Army, Close Combat Systems Program Office

FY 2003 Accomplishments: Obtained project approval.
FY 2004 Plans: Award contract for system modification. Complete integration of sensors into the gunfire detection system. Initiate technical testing.
FY 2005 Plans: Complete technical testing. Conduct operational testing and user evaluation. Compile test results and prepare documentation in support of a milestone decision. Award contract for production buys.

	Service	FY 2003	FY 2004	FY 2005
Embedded Integrated Broadcast Service (IBS) Receiver (EIR)	USSOCOM	0.821	1.323	0

This project will evaluate the next generation IBS receiver which is smaller, lighter, and less costly than current equipment. EIR will provide timely receipt of intelligence data required by the tactical war fighter. The tactical war fighter, especially aircraft, relies heavily on near real-time intelligence information for threat avoidance, detection, targeting, blue force tracking and personnel recovery.

Vendor: L-3 Communications, Telemetry-West, San Diego, CA
Program Office of Record: USSOCOM PEO, Intelligence and Information Systems (IIS/SP)

FY 2003 Accomplishments: Obtained project approval. Drafted contract documentation for design modification.
FY 2004 Plans: Award contract for design modifications and production-representative systems. Conduct technical, operational, and interoperability testing.
FY 2005 Plans: Compile test results and prepare project close out documentation. Incorporate results into production configuration.

	Service	FY 2003	FY 2004	FY 2005
Enhancements for Fly Away SATCOM (FASC)	USSOCOM	0.436	0.937	0

This project will evaluate operational enhancements to SOF's Fly Away Satellite Communications (FASC) Terminals. This project, if successful, will provide critical operational enhancements to the FASC terminals enabling faster world wide deployments, higher transmit and receive high bandwidth/performance, ease-of-use, and Ka Band communication satellite integration.

Vendor:SWE-DISH Satellite Systems, Inc., Washington, DC
Program Office of Record: USSOCOM PEO, Intelligence and Information Systems/Special Projects (IIS/SP)

FY 2003 Accomplishments: Obtained project approval in late FY 2003.
FY 2004 Plans: Complete system modification and receive test hardware. Complete technical evaluation to determine area of coverage, quality of service, and data rates. Complete operational suitability and effectiveness testing. Compile test data and prepare documentation in support of a milestone decision.

	Service	FY 2003	FY 2004	FY 2005
Usage Based Small Arms MX: SOPMOD Host Weapons Shock Profile Database	USSOCOM	0.368	0	0

This project will record shock profiles digitally for each weapon using an assortment of Special Forces munitions and accessories to establish a complete inventory of profiles. These profiles will then be replicated using an electro-magnetic exciter to reproduce the effects of firing those weapons when testing accessories (e.g. night vision scopes, thermal sights, etc.). This method of testing will eliminate the expenditure of ammunition and destruction of weapons, and save of thousands of man-hours during future testing.

Vendor: Bruel and Kjaer Testing Support, Norcross, Georgia.
Program Office of Record:Special Operations Peculiar Modification (SOPMOD) Program Office, NWSC Crane

FY 2003 Accomplishments: Obtained project approval in late FY 2003.
FY 2004 Plans: Acquire ammunition, procure weapons for testing, and develop test fixtures. Conduct technical and operational testing to develop shock profile data. Compile results and prepare the database.

	Service	FY 2003	FY 2004	FY 2005
Second Generation Rail Interface System (RIS II) for M4 Carbines	USSOCOM	0.153	0	0

This project will evaluate a ruggedized M4 Rifle interface with the current grenade launcher. The current interface can lose alignment during normal operations. This project will implement an improved design that is more rugged than the current interface and is easier for the field operator to maintain.

Vendor:Multiple U.S. Vendors
Program Office of Record:Special Operations Peculiar Modification (SOPMOD) Program Office, NWSC Crane

FY 2003 Accomplishments: Project approval in late FY 2003.
FY 2004 Plans: Award contract for prototype systems. Prepare developmental and operational test plans. Conduct testing and obtain safety certification. Compile test results and prepare documentation in support of a procurement decision.

	Service	FY 2003	FY 2004	FY 2005
Integrated Schedule/Process for Global Hawk Spiral Development	Air Force	0	0.319	0

To date neither industry nor Government program offices have developed an effective means of implementing existing integrated scheduling techniques into the spiral development process. This project seeks to provide the Global Hawk program with an integrated schedule to be used daily with schedule risk tools and at all reviews, to optimize program management and reduce future program risk. If successful, this project will provide defense organizations a more robust and disciplined process to use in scheduling spiral development (multiple spirals) programs.

Vendor: Dayton Aerospace, Inc., Dayton, OH
Program Office of Record: Global Hawk Program Office

FY 2004 Plans: Develop test plan, execute test, procurement decision.

	Service	FY 2003	FY 2004	FY 2005
Integrated Defensive Countermeasures Alternative	Air Force	0.677	0.345	0.360

This project will evaluate a fiber optic (FO) alternative to a towed decoy presently deployed to the warfighters. This proven technology has shown superior performance in the laboratory and requires engineering efforts to establish a qualified commodity for Air Force platforms integration and testing.

Vendor: Raytheon Space & Airborne Systems, Goleta, CA
Program Office of Record: Air Force Towed Decoy

FY 2003 Accomplishments: Identified thermal hardening and wrap solution of the fiber optic towline to allow deployment envelope expansion testing on the F-15 through the engine plume. Resulting design changes being built into 12 decoy mass models for flight test in FY 2004. Also upgrading integrated multi-platform launcher controllers to accelerate future F-15 flight testing.

FY 2004 Plans: Complete flight test of 12 decoy mass models with refined thermally hardened FO towline and improved towline wrap while expanding deployment envelope and FO continuity duration. Analyze flight test results, identify needed fixes, and incorporate those fixes into FY 2005 flight test Mass Models (MM) for final flight envelope expansion. Build 2 electronic decoys with improved design changes for effectiveness testing in FY 2005.

	Service	FY 2003	FY 2004	FY 2005
Speech Recognition Technology for AWACS	Air Force	0.492	0	0

This project will evaluate a speech recognition technology that will allow the operator to control and configure the Primary AWACS Display, rapidly access necessary workstation functions and information, and will allow multiple manual functions to be performed all with voice command.

Vendor: Syntronics, Dayton, Ohio
Program Office of Record: E-3 Airborne Warning and Control System (AWACS)

FY 2003 Accomplishments: Contract award with Syntronics. Conduct initial planning and requirements definition. Conduct test and evaluation of speech recognition technology and develop prototype system for operational use in a 40/45 AWACS.

FY 2004 NEW START PROJECTS:

	Service	FY 2003	FY 2004	FY 2005
Collapsible Stocks for Special Operations Machine Gun	USSOCOM	0	0.100	0

This project will evaluate an enhanced collapsible stock for the MK46 and MK48 machine guns. Incorporating a collapsible stock will make the weapons more effective for operations in an urban environment, Close Quarters Combat and in vehicles. One stock design will interface with both MK46 and MK48, thereby, reducing the logistics burden.

FY 2004 Accomplishments: Project approval. Award contract for design modifications and prototype systems. Conduct technical, operational and interoperability testing. Compile test results and prepare project close out documentation to support procurement decision.

	Service	FY 2003	FY 2004	FY2005
Restore Effective Survival in Shock (RESUS)	Air Force	0	1.380	1.500

This is a trial of bovine polymerized hemoglobin for the prehospital resuscitation of casualties in hemorrhagic shock. The item is a low volume and weight, room temperature stable substitute for blood transfusions. It is expected to significantly decrease combat casualty morbidity and mortality. Hemorrhage accounts for 60% of potentially salvageable combat casualties. Because 90% of these deaths occur prior to evacuation to a forward surgical theater, decreasing combat morbidity and mortality must focus on optimizing pre-evacuation resuscitation. Unlike older WWII and Vietnam resuscitation fluids, such as plasma, new products are effective as oxygen carriers and are highly likely to decrease hemorrhagic shock casualties, which remain at 30-100% depending on severity. The benefit of this program is that it will save lives of combat troops. Hemopure circulates directly in plasma when infused, increasing oxygen diffusion to the body's tissues and is compatible with all blood types, can be stored for 3 years without refrigeration, and is pathogen free.

Vendor: BIOPURE Corporation, Cambridge, Massachusetts
Program Office of Record: 311 HSW, Human Systems Program Office, Brooks Air Force\ Base, Texas

FY 2004 Plans: RESUS is a two-stage phase IIb/pivotal clinical trial project to compare the relative efficacy and safety of Hemopure with standard care products. Complete institutional review boards approvals for test protocols. Secure FDA

allowance for project investigational new drug. Complete phase IIb trial (Stage I of program) testing. Initiate pivotal trial testing (Phase II) program.
FY 2005 Plans: Complete pivotal trial testing (Phase II protocol).
FY 2006 Plans: Compile pivotal trial data to support FDA approval for prehospital resuscitation of hemorrhagic shock casualties.

	Service	FY 2003	FY 2004	FY2005
X-Cor as a Replacement for Conventional Honeycomb	Army	0	0.920	1.005

X-Cor is a lightweight, damage tolerant core material that replaces conventional honeycomb in aerospace structures. A 10% weight reduction over the baseline honeycomb on Comanche (RAH-66) is estimated. This is critical because weight reduction is quite significant to the Comanche program in two respects. First, it greatly increases helicopter performance, particularly in vertical lift/rise capability, which greatly increases aircraft survivability and capacity; and, second, this 10% reduction could amount to a 25% RDT&E cost avoidance over other weight reducing alternatives.

Vendor: Aztex, Inc, Waltham, MA
Program Office of Record: PM-Comanche

FY 2004 Plans: Project approval. Contract prep/award. Conduct coupon level and element level testing to support manufacturing scale-up.
FY 2005 Plans: Conduct core design and qualification testing to support manufacturing implementation and program insertion decision for Aircraft 7 flight test.
FY 2006 Plans: Final evaluation report. Continue flight testing. Conduct production review for insertion into the Comanche.

	Service	FY 2003	FY 2004	FY2005
"On Aircraft" Laser Additive Repair of Titanium Components	Air Force	0	0.827	1.710

This project will implement the process of Laser Additive (on Aircraft) repair of damaged titanium B-2 airframe surfaces. This technology will improve mission readiness,

currently compromised by cracks which develop on the aft deck. The proposed technology insertion program will improve the maintenance of mission readiness which is currently compromised by cracks which develop on the Aft Deck. The program will be enabled by the integration of a laser head and titanium feeding mechanism with a portable, adaptive, multifunctional machine tool pod incorporating a conformal inert gas shielding shroud and the development of a comprehensive process to fill cracks with micro-welded titanium alloy to restore the stealth integrity of the damaged surfaces.

Vendor: Triton Systems, Inc., Chelmsford, MA
Program Office of Record: B-2 Systems Program Office

FY 2004 Plans: Initiate Laser Additive Repair (LAR) process validation and qualification testing.
FY 2005 Plans: Continue and complete validation and qualification testing to support Certification decision for use on B-2.
FY 2006 Plans: Develop technical data packages and close out report.

	Service	FY 2003	FY 2004	FY2005
Automated EPLRS Planner	Marine Corps	0	0.507	0

The Automated Enhanced Position Location Reporting System (EPLRS) Planner is a "technology insertion" into the Systems, Planning, Engineering, and Evaluation Device (SPEED) software application that assists and automates. The product fills a critical USMC need to automate planning for communications supporting the tactical data network at Regiment and below; including the more efficient use of reduced manpower to plan and manage an EPLRS network, and the potentially life saving ability to step through planning processes of a military operation.

Vendor: Northrop Grumman Information Technology, Winter Park, FL
Program Office of Record: PM Communications, Marine Corps Systems Command, 2200 Lester Street, Quantico, VA 22134

FY 2004 Plans: Perform Software Requirements Analysis and determine Software Design. Perform code and unit test of software. Execute integration testing and conduct Functional Qualification Testing to support procurement and field decision.

	Service	FY 2003	FY 2004	FY2005
Speed QoS Planner	Marine Corps	0	0.406	0

The Systems, Planning, Engineering, and Evaluation Device (SPEED) Quality of Service (QoS) Planner is a "technology insertion" into the SPEED software application. The project proposes to enhance the capability of radio frequency (RF) path engineering tool to ensure quality performance for networks such as the Enhanced Position Location Reporting System (EPLRS) with applicability to the Joint Tactical Radio System (JTRS). A SPEED QoS will enable the communications planner to dynamically engineer and plan networks as needed to ensure that the flow and data priority are supportable.

Vendor: Northrop Grumman Information Technology, Winter Park, FL
Program Office of Record: PM Communications, Marine Corps Systems Command, 2200 Lester Street, Quantico, VA 22134

FY 2004 Plans: Perform Software Requirements Analysis. Determine software design and perform code and unit test of software. Execute testing to include Integration Testing, Functional Qualification Testing, and final Acceptance Test and Evaluation to support procurement and field decision.

	Service	FY 2003	FY 2004	FY2005
Common Tactical Picture Ground Mobile and Air Based Command and Control Systems	Marine Corps	0	1.761	0

The EFV(C) C4I suite integrates multiple coordinated Army Fire Zone and USMC blue and red force databases to provide a ground mobile Common Tactical Picture (CTP). The C4I suite is on the move capable, hardened for harsh environments, and can be readily integrated with satellite communications as with Sea Viking. EFV and Sea Viking will be conducting two limited technical assessments (LTAs) for wheeled vehicle use in preparation for OIF implementation in June/July 2004. With additional testing and further maturation of the spray cooling technology on which this system is based, the Ground Mobile CTP can be transitioned to airborne command elements.

Vendor: Isothermal Systems Inc., Clarkston, WA
Program Office of Record: DRPM AAA, Worth Avenue Technology Annex, 14041 Worth Ave, Woodbridge, VA 22192

FY 2004 Plans: Conduct System Development and Integration; Receive test articles (6 systems); Conduct qualification testing; Conduct Quarterly Integrated Product Team (IPT) Meetings; Conduct Wheeled Vehicle Demonstration (Sea Viking); Conduct Rotary Wing Demonstration (USMC AH1 or Army H60); Procurement Decision.

	Service	FY 2003	FY 2004	FY2005
Friction Stir Processing for Virginia Class Submarines	Navy	0	0.288	0.600

Friction Stir Processing (FSP) allows rapid repair of surface and subsurface casting defects, improves the surface layer mechanical properties, and may substitute for conventional welding. FSP will greatly improve current weld and weld repair techniques for naval propellers and has the potential to cut manufacturing and repair time from 12 months to 3 months.

Vendor: General Tool Company, Cincinnati, OH; MTS Corporation, Eden Prairie, MN 55344
Program Office of Record: PMS450 VIRGINIA Class Submarine Acquisition Office, Naval Sea Systems Command, 614 Sicard Street SE Stop 7022, Washington Navy Yard, DC 20376-7022

FY 2004 Plans: Design and procure friction stir machinery, compatible with the Naval Foundry and Propeller Center infrastructure, using the Friction Stir Processing technology as a cost and time effective alternative for metal repair and surface enhancement for US Navy Ni Al bronze (NAB) propulsors/propellers

FY 2005 Plans: Install and support startup operation of the friction stir machinery at the Naval Foundry and Propeller Center, Philadelphia, PA. Friction Stir Processing allows rapid repair of surface and subsurface casting defects, improves the surface layer mechanical properties, and may substitute for conventional welding.

FSP will greatly improve current weld and weld repair techniques for naval propellers and has the potential to cut manufacturing and repair time from 12 months to 3 months.

FY 2005 DACP Program Plans:

For FY 2005, the DACP program will continue to fund testing activities on 11 projects executing $8.739 million in FY 2005 funding. Services and USSOCOM will begin the FY 2005 DACP

Proposal selection process beginning in March 2004 with submission of their recommended propsoals. The FY 2005 DACP New Start selections will be made by the Deputy Assistant Secretary of Defense (Advanced Systems & Concepts) (DUSD(AS&C)) in September 2004.

C. **(U) OTHER PROGRAM FUNDING** NA

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2a Exhibit)								DATE February 2004	
APPROPRIATION/BUDGET ACTIVITY Defense Wide RDT&E (0400) Budget Activity Three					R-1 ITEM NOMENCLATURE Quick Reaction Special Projects/**Technology Transition Initiative (TTI) Program** **PE 0603826D8Z P829**				
COST *(In Millions)*	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	Cost to Complete	Total Cost
Total Program Element	24.076	46.566	64.389	89.927	90.408	92.111	94.143		
TTI P829	**6.019**	**13.251**	**21.463**	**29.976**	**30.136**	**30.704**	**31.381**	**Continue**	**Continue**

A.(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Quick Reaction Special Projects Program (Program Element 0603826D8Z) has three sub-elements: the Defense Challenge Program, the Technology Transition Initiative and Quick Reaction Special Projects (QRSP). The fiscal controls above represent an approximate investment of the Quick Reaction Special Projects Program funding for the Technology Transition Initiative (TTI) Program.

Authorized by Title 10, Section 215 of the FY 2003 Defense Authorization Act, the Technology Transition Initiative (TTI) Program addresses the funding gaps that exist between the time a mature technology is demonstrated and the time it can be procured for use in an intended weapons system or operational capability for the warfighter. The TTI Program facilitates the rapid transition of mature technologies from the S&T base into procurement or acquisition programs. The initiative's objectives are to accelerate the introduction of new technologies into operational capabilities for the armed forces and to successfully demonstrate new technologies in relevant environments.

Technology Transition projects are selected by the Technology Manager in consultation with representatives of the Technology Transition Council (TTC). (The TTC is comprised of the Acquisition and S&T executives from each service and Defense Agency and representatives from the JROC.) The call for Technology Transition Proposals goes to the DoD Services and Agencies through the Technology Transition Working Group (TTWG) members, designated by the TTC. The TTWG gather the proposals from the service/agency S&T base and then prioritize them based on Joint, Service or Agency capabilities needed and submit

them to the Technology Manager. The Technology Manager's senior staff merges the lists and evaluates the Service/Agency recommendations and prepare a recommended list to the Technology Manager for funding. The Transition Manager in coordination with the TTC select the highest priority proposals for funding.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 2003 New Start Projects

	Service/Agency	FY 2003	FY 2004	FY 2005
Missile Health Monitoring	Army	1.417	1.595	0

The Army has no capability to remotely monitor and assess the long-term storage health of its missile systems. Missiles not fired during recent deployments cannot be retrograded and returned to storage without inspection and in some cases re-certification because of unknown serviceability and potential safety issues. This has resulted in a number of critical missile assets being condition coded for demilitarization, repair, and/or training-use-only from Operation Iraqi Freedom, Desert Storm and other recent deployments. Additionally, extensive operating and support costs have been expended in attempts to determine the condition of retrograded missiles. Devices are needed throughout the military to monitor the missile stockpile in long term storage in order to ensure only serviceable assets are deployed for combat use. This program will transition prototype health monitoring technology to the Army Patriot Advanced Capability-3 and Theater Area Air Defense System missiles.

FY 2003 Accomplishments: A program was initiated to transition missile health monitoring technology developed under the Remote Readiness Asset Prognostics/ Diagnostics System (RRAPDS) Science and Technology Objective program. This effort is focused on application and transition of missile health monitoring technology to the PATRIOT Advanced Capability – 3 (PAC-3) missile system. This PAC-3 effort will be the first spin-off of RRAPDS technology to address issues of missile degradation noted for PAC-3 in Operation Iraqi Freedom, as well as other serious missile degradation concerns noted for other Army systems in recent deployments. In FY 2003, a final design study for PAC-3 missile monitoring was completed, a requirements specification was generated, and preliminary design efforts were begun.

FY 2004 Plans: Final design efforts will result in a complete prototype system to be built in FY 2004 with full functionality to monitor the health of the PAC-3 four-pack canister and missiles. Testing of these prototypes will be initiated in FY 2004, as well as the installation and preliminary demonstration of prototype devices in fielded PAC-3 assets. Efforts will also begin in FY 2004 to modify the PAC-3 design for application to the Theater Area Air Defense (THAAD) missile.

	Service/Agency	FY 2003	FY 2004	FY 2005
Terminal Attack Control (TAC) Earplugs	Air Force	0.680	0	0

The TAC Earplug system is a custom-molded device integrated with tactical radios and an external microphone. The TAC Earplug TTI project will: (1) convert the analog TAC Earplug System to digital one-box design; (2) Convert compression technology to digital circuitry; (3) Increase connectability with USB/computer access; (4) Reduce the weight with Injection Molded design; (5) Convert the power source from 9-volt to AA; and (6) Harden internal circuitry for operational use. It provides blast protection while increasing communications in high noise environments, and allows for enhanced natural hearing in quiet, clandestine environs. The potential exists for additional procurement by all Services.

FY 2003 Accomplishments: Contract award and delivery of 200 units to field operators; field test evaluation with operator feedback on design and functionality; field test evaluation revealed four major areas of improved capability needs: modularize the box to fit with field armor equipment; improve power (i.e., battery life too short); make earpieces independent of the processing box; and create interface connector for Armored Personnel Carrier (APC). Overall field evaluation feedback, "system fulfills 85% of communication needs. . .this is a product that will make a difference". Transition plan – AFSOC preparing to purchase additional units (approx. 200) for their personnel. Army and Navy are interested/waiting to see results of the digital modifications and operational testing.

	Service/Agency	FY 2003	FY 2004	FY 2005
Battlespace Terrain Reasoning Awareness (BTRA)	Army/NIMA	1.020	0.990	0

Battlespace Terrain Reasoning Awareness (BTRA) is a software product constructed on the stability of a premier Commercial-Off-the-Shelf (COTS) Geographic Information System. BTRA tactical decision aids (TDAs) integrate terrain and weather (current and forecasted) data and provide actionable, integratable, predictive information regarding their effects on platforms, sensors, systems, small units, large forces and their associated tactics and behaviors. BTRA provides specific analysis tools addressing positions of advantage, mobility and maneuver and effects on sensors (imaging, seismic and acoustic). BTRA also provides predictive terrain and weather decision tools addressing maneuver, situation and threat analysis and Intelligence, Surveillance and Recognizance (ISR) management within Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) processes. BTRA capability addresses several joint systems requirements for terrain and weather tactical decision aids (TDAs) from Army (Digital Topographic Support System (DTSS) and All-Source Analysis System-Light (ASAS-L)), Air Force (Time Critical Targeting Facility (TCTF)of their Theater Battle Management Core System (TBMCS) C4ISR), and DISA/NIMA's Commercial Joint Mapping Toolkit (CJMTK) Software Requirement.

FY 2003 Accomplishments: (1) BTRA technology has been officially identified by NIMA as a capability for inclusion in the 2 FY 2004 releases (V2.0 and 3.0)of Commercial Joint Mapping Toolkit (CJMTK). *Note: CJMTK is the enterprise terrain and weather application for Joint C4ISR.* 2) Initiated design of embedded applications, information services and database constructs consistent with CJMTK requirements. 3) Transitioned technology to USAF Time Critical Target Facility (TCTF). Two prototypes fielded with 32AOG Ramstein AFB and HQ 12thAF at Davis Monthan AFB. 4) Provided test support to TCTF developmental and operational testing. 5) BTRA was used in Iraq through engineering soldiers using DTSS version 8.0.

FY 2004 Plans: (1) Two transition(s) of BTRA to CJMTK; (2) CJMTK transition is the basis for transition and system specific transitions to the Army Digital Topographic Support System (DTSS) and Digital Common Ground Station – Army (DCGS-A); USAF's Theater Battle Management Core Systems (TBMCS and the USMC's Topographic Production Capability (TPC).
Specific mission and system tailoring for DTSS, DCGS-A, TBMCS, TCTF and TPB.

	Service/Agency	FY 2003	FY 2004	FY 2005
Unmanned Vehicle Spiral Upgrade (IROS3 Spartan)	Navy	0.623	0.605	0

IROS3 is a network centric overarching Anti-Terrorism/Force Protection (AT/FP) system which integrates sensor information while combining semi-automated engagement capability to provide shipboard protection, pierside, at anchorage and transiting restricted waterways.

Spartan is a modular, reconfigurable, multi-mission, high-speed, semi-autonomous unmanned sensor and weapon system against asymmetric threats.

This project will conduct a spiral upgrade of the IROS3 system to accommodate the integration of an unmanned vehicle. Concept will be proven using the Spartan USV ISR/FP module as a sensor inputs to IROS3.

FY 2003 Accomplishments: Long lead items have been procured, research and design approach for open system-to-system communication completed, operational and design requirements have been evaluated, and action plan, test schedule and statements of work have also been completed.
FY 2004 Plans: Complete interface development and system integration to perform a full-scale demonstration of SPARTAN sensor control via the shipboard IROS3 systems console. Demonstration will be*- used to develop concept of operations for SPARTAN to be used with IROS3 to perform future AT/FP shipboard mission.

	Service/Agency	FY 2003	FY 2004	FY 2005
Lightweight Steel Track	Marine Corps	0.170	0.193	0

The U.S. Marine Corps is seeking a lightweight steel track for the Advanced Amphibious Assault Vehicle (AAAV). The German track manufactured by Diehl has a candidate ultra-light steel prototype track, which has the potential to meet or exceed AAAV's track performance criteria. This track weighs approximately 40% less than typical steel track (at comparable cost) and is expected to have a minimum life of 3,000 miles. This ultra light steel track is significantly more robust than the current aluminum now being used on AAAV, is less expensive, and weighs the same. The goal of this TTI project is to

procure and test the Diehl Ultra-light Steel Track on an AAV with the intent to purchase additional track sets if performance meets expectations. Test will demonstrate and validate the track integrity and robustness suitable for a harsh Marine field environment.

FY 2003 Accomplishments: Procure and install German track into prototype AAAV test vehicle. Conduct initial track testing.
FY 2004 Plans: Complete track testing, conduct data analysis and complete final report.

	Service/Agency	FY 2003	FY 2004	FY 2005
Low-Cost Flame Resistant Coveralls	Army	0.227	0.341	0

There is a critical need to address the high cost of flame resistant material used to protect our warfighters. Currently aviators and tankers wear protective clothing made from woven Nomex and Kevlar fiber. However, these fabrics are too expensive to issue to every infantry soldier. A study was undertaken to evaluate and develop new materials that provide a 30%-50% cost savings over existing flame resistant materials as well as camouflage protection, comfort and durability. This new fabric is a lightweight, open, air-permeable construction, spun-laced and non-woven fabric that is enhanced to military specifications. It is estimated to save more than 40% in costs from the current materials, potentially increasing the number of warfighters protected by 40%.

FY 2003 Accomplishments: Material development including functional finishes; test and evaluation and fabric manufacturing; Garment enhancements to include design, sizing and garment manufacturing
FY 2004 Plans: Conduct wear trials; questionnaire development, wear trial support, data analysis and report preparation.

	Service/Agency	FY 2003	FY 2004	FY 2005
Joint Theater Logistics	DARPA/DISA	0.408	0	0

There are twenty-eight (28) applications that comprise the Joint Theater Logistics (JTL) Advanced Concept Technology Demonstration (ACTD). The Military Utility Assessment was

inconclusive for the entire package but there are two applications that could be transitioned with minimal modification that could satisfy immediate requirements for the Global Combat Support System (GCSS) user community. The two JTL applications ready for immediate transition are: Watchboard and Forces Library.

Watchboard is designed to convey summary status information to the commander and his staff in an easy to comprehend manner to quickly identify the areas that require attention. Each commander and each situation will require variations of the items that should be tracked in this status visibility tool, therefore, the local user will be able to tailor his/her display to the organizations and the subordinate units and/or scheduled queries executed from available data sources. This tool will save many hours of staff work preparing reports for the commander and will provide more accurate and timely information.

Forces Library allows the user to define the organizational relationships of a task force. Current Forces Database (CFDB) contains the administrative hierarchy of units. JOPES contains information about the organizational hierarchy of units designated for an Operations Plan. An authorized individual within the J3/Assistant Chief of Staff for Operations and J4/Assistant Chief of Staff for Logistics will be able to define and refine over time the task force unit relationships. This data will be used in many GCSS applications, such as tracking deployments and redeployments, asset queries associated with a task force.

FY 2003 Accomplishments: Complete transition of the Watchboard and Forces Library applications into the Global Combat Support System (GCSS).

	Service/Agency	FY 2003	FY 2004	FY 2005
Overwatch	Army	0.510	0.495	0

Overwatch helps the warfighter detect, locate, and classify hostile firings. It also conducts area surveillance in real time to assess, neutralize, and mitigate the enemy by providing counterfire targeting data. Overwatch is focused on developing and testing an on the move tactical Overwatch Weapon Recognition Equipment tactical, which is mountable on ground vehicles.

FY 2003 Accomplishments: Components and initiated of Field of View Trades to increase area of regard
FY 2004 Plans: Complete the build and testing of the STARE; deliver to PACOM/ONR Gunslinger Project.

	Service/Agency	FY 2003	FY 2004	FY 2005
Special Operations Forces (SOF) Demolition Kit	SOCOM	0.227	0.385	0

The Special Operations Forces (SOF) Demolition Kit provide the front-line warfighter with a replacement kit for the Army's 1950 vintage demolition kit. The kit contains Explosively Formed Penetrator (EFP) warheads, linear cavity charges, conical cavity charges, and a variety of attachment devices. The charges provide the user the ability to attack targets at close range or at standoff distances up to 100 meters against a variety of targets, including rolled homogeneous armor and reinforced concrete columns.

FY 2003 Accomplishments: Accelerate existing development effort being managed by the Army, Office of the Project Manager for Close Combat Systems, Picatinny, NJ to add pre-loaded EFPs for increased demolition capabilities.
FY 2004 Plans: Develop and demonstrate other demolition kit enhancements. Options under evaluation to be applied real-time based on evolving SOF priorities that satisfy a capabilities-based operational requirement, include: (1) Rapid Wall Breaching Blanket; (2) Mechanical Breaching System; (3) Rapid Re-bar cutting device; and (4) Prefabricated Explosive Carriers for Tactical Explosive Entry.

	Service/Agency	FY 2003	FY 2004	FY 2005
Special Operations Forces (SOF) Alternative Power Sources	USSOCOM	0*	1.562	0

This effort transitions advanced alternative power sources (e.g., cell, solar panels, and mini diesel engines) to various DoD Science and Technology efforts products that an SOF Team can field test to reduce the weight of the SOF operator rucksack. This project will

evaluate six (6) different alternative power sources: (1) Ball Direct Methanol Fuel Cell (DMFC); (2) MTI Fuel Cell - SISA; (3) MTI Fuel Cell - PDA; (4) Jadoo SuRE II Fuel Cell; (5) AET Generator; and (6) Uni-Solar Uni-Pac.

(NOTE: The Commercial Operations and Support Savings Initiative (COSSI) Program (Program Element 0604804D8Z) supported the FY 2003 purchase ($100K) and demonstrate the Jadoo SuRE II Fuel Cells and the 20-watt Ball Direct Methanol Fuel Cell (DMFC).)

FY 2004 Plans: Purchase and demonstrate the MTI Fuel Cell - SISA; MTI Fuel Cell - PDA; AET Generator and Uni-Solar Uni-Pac alternative power sources.

	Service/Agency	FY 2003	FY 2004	FY 2005
Titanium Nitride (TiN) Coating for T-58 Engine Compressor Blades	Marine Corps	0.482	0.468	0

The U.S. Marine Corps H-46 helicopter is experiencing a high rate of premature engine removals while operating in Afghanistan and Iraq. Substantial engine performance loss results from compressor airfoil erosion due to particle ingestion during routine operation in desert environments. TiN coating for the T-58 engine will double compressor life in a sand environment and is projected to save about $56 million in Life Cycle Costs through FY 2012 and will increase compressor life in a sand environment by a minimum factor of two. The airfoils will be installed in nearly 300 new T-58-16A ERIP compressor cores procured for USMC CH-46 helicopters beginning in FY 2005 through FY 2007.

FY 2003 Accomplishments: Proof of concept coating completed; initial Fatigue Testing completed; laboratory Erosion Testing completed; first set of manufacturing tooling designed and fabricated; and initial coating airfoil distortion evaluation completed

FY 2004 Plans: Complete fatigue testing of coated airfoils; fully coat (2) sets of T58 compressor airfoils; build a Lead the Fleet engine with coated airfoils to be evaluated in South West Asia; build (2) sand ingestion test engines, one coated – one uncoated, for final qualification of coating; complete the design change and approve the ECP; perform all coating vendor substantiation engineering; and modify the ERIP contract to include coated airfoils in module production

	Service/Agency	FY 2003	FY 2004	FY 2005
Water Purification System/ Water Pen	DARPA	0.255	0.413	0

For tactical situations in which deployed troops do not have quick and easy access to potable water, the water purification pen will allow soldiers to treat up to 300 liters of any available, non-brackish water source, eliminating the risk of their exposure to diseases and bio-chemical pollutants.

Mixed oxidants electrochemically generated from common table salt via several small lithium camera batteries kill a wider range of resistant microorganisms (e.g., Cryptosporidium, Giardia, and E.Coli) present in contaminated, non-brackish water than more traditional means of disinfection (e.g., chlorine and iodine).

FY 2003 Accomplishments: Through a GSA Schedule contract, procured 2,494 water purification pens and distributed them throughout the Services and U.S. Special Operations Command (SOCOM).
FY 2004 Plans: Through the same GSA Schedule contract, procure 4,157 additional water purification pens and distribute them throughout the Services and U.S. Special Operations Command. After all water purification pens (total 6,650) are procured and distributed, each Service (Army, Air Force, Navy and Marine Corps) and U.S. SOCOM will receive 1,200 pens each with remaining pens distributed to stock testing units who will evaluate item.

FY 2004 New Start Projects:

The selection process for the FY 2004 TTI Projects is in the final stages with recommendations being made to the Technology Manager and the Technology Transition Council (TTC) for consideration. The FY 2004 budget plans for $13.251 million. Prior FY 2003 continuing TTI project funding requirements will leave $6.068 million for FY 2004 TTI New Start Projects. Projections indicate we may have 4-6 FY 2004 new start projects serving the DOD community with project leads in the Air Force, Army, Navy, MDA, SOCOM, DISA and NGA.