OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**

	Cost ($ in Millions)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
	Total Program Element (PE) Cost	127.268	108.942	107.782	112.343	116.315	117.817	112.266
P826	Quick Reaction Fund	35.255	29.241	28.728	30.145	31.913	32.660	31.044
P828	Rapid Reaction Fund *Reprogramming Actions	71.697	50.460	50.326	52.053	52.489	52.495	50.180
P829	Technology Transition Initiative (TTI)	20.316	29.241	28.728	30.145	31.913	32.662	31.042

A. Mission Description and Budget Item Justification: Quick Reaction Special Projects Program supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter. The projects that are part of the QRSP are the Quick Reaction Funding (QRF), Technology Transition Initiative (TTI), and the Rapid Reaction Fund (RRF). QRSP provides the flexibility to respond to emergent DoD issues and address technology surprises and needs within the years of execution outside the two-year budget cycle. The TTI program is mandated by Congress and receive high congressional interest. The DACP program transferred in FY2005 and outyears to PE 0604051D8Z to comply with congressional direction.

(U) The Quick Reaction Fund (QRF) program is focused on responding to emergent needs during the execution years that take 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 critically needed by combatant commanders for operations. Typically these projects are on the technology maturity scale where an idea or technology opportunity is proven and demonstrated. In FY 2005, over 100 proposals were reviewed and 13 projects were funded.

(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 facilitate 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.

(U) RRF is fully executed through the Combating Terrorism Technology Task Force (CTTTF). The FY 2005 funding in RRF is the result of internal Reprogramming Actions to allow a rapid response to operations in Iraq and other theaters in support of the Global War on Terrorism (GWOT) and is used to accelerate the transition of high-potential science and technology projects into operationally useful products in the execution years.

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006)	40.929	110.717	111.026
Current BES/President's Budget (FY 2007)	127.268	108.942	107.782
Total Adjustments	86.339	-1.775	-3.244
Congressional Program Reductions		-1.775	

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Congressional Rescissions			
Congressional Increases			
Reprogrammings	82.608		
SBIR/STTR Transfer	3.674		
Other	0.057		-3.244

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics:

FY	Strategic Goals Supported	Existing Baseline	Planned Performance Improvement / Requirement Goal	Actual Performance Improvement	Planned Performance Metric / Methods of Measurement	Actual Performance Metric / Methods of Measurement
07						

Comment: QRF/RRF: Program completion and success will be monitored against program schedule and deliverable stated in the proposals.

TTI: In FY 2005, initiate the new start of 13 projects and conclude activities on many continuing projects with the result of at least 10 technologies transitioning to the warfighter.
In FY 2006, initiate the new start of 18 projects and conclude the activities on many continuing projects with the result of at least 12 technologies transitioning to the warfighter.
In FY 2007, initiate the new start of 19 projects and conclude the activities on many continuing projects with the result of at least 14 technologies transitioning to the warfighter.

RRF: In FY 2005, develop high-risk/high-payoff technologies to improve IED threat detection, beyond the short-term focus of the Joint IED Defeat Task Force.

In FY 2006/FY 2007, RRF investment decisions are made during the execution years in response to combatant commander requirements and new threats/new opportunities.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P826**

Cost ($ in Millions)		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
P826	Quick Reaction Fund	35.255	29.241	28.728	30.145	31.913	32.660	31.044

A. Mission Description and Project Justification: The Quick Reaction Fund (QRF) provides flexibility to respond to emergent warfighter needs in the execution years. It takes advantage of technology breakthroughs in rapidly evolving technologies with expected completion within 6 to 12 months.
(U) Quick Reaction Fund - A data call was released on December 1, 2004 requesting proposals in response to emergent operational needs and to capitalize on technologies. To assist in prioritizing the proposals, the call letter requested the Service and Agency Science and Technology Executives and the DDR&E principles submit their top ten proposals. A notification on the DDR&E website was also posted so there was another avenue to submit proposals. 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 real-time operational needs. Each proposal addressed the description of the technology/concept, description of any demonstration testing required, description of technical, funding, and schedule risk, proposed executing Service/Agency and User. The proposals were reviewed for technical and warfighter relevance review. Projects awarded with FY 2005 funding include NAVEODTECH DIV Support of CTTTF Yuma Proving Ground Project, MK-82 Phase II Precision Lethality Munition Demo, Enhanced Target Acquisition and Location System (ETALS), Enhanced Capability for Remote Detection of Suspicious Activity, Rapid Response to Part Acquisition Repair and Deployment, et.al. Below is more in-depth discussion of the projects funded. Because these programs are one time efforts, there are currently no plans to fund them in other years. However, for the overall QRF program, FY 2006 and 2007 plans are to continue to respond to critical operational needs and technology opportunities.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Yuma Proving Grounds (YPG):	0.500	0.000	0.000
Provide threat devices, tactics, techniques and procedures for use in testing of all systems developed under Quick Reaction Capability for Force Protection Needs in Support of OIF Military Forces. NAVEODTECHDIV will provide engineering services and test and evaluation support to ensure testing of all prototype equipment is performed against operational significant targets.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Enhanced Target Acquisition and Location System (ETALS):	0.600	0.000	0.000
The ETALS program is an ongoing technology effort to eliminate the dependence on the Digital Magnetic Compass (DMC). ETALS has developed a gyro based north finding azimuth sensor that is nearly ready for production. This system is known as the Miniature Azimuth Gyro compassing Unit (MAGU). The use of DMC compass, under ideal circumstances, yields target location errors on the order of 30 meters at a standoff range of 5 kilometers. Unfortunately, urban environments and operations near vehicles are not ideal circumstances, and these situations adversely affect the compass without warning to the operator.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007

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APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P826**

	FY 2005	FY 2006	FY 2007
Phase II Precision Lethality Munition Full-Scale Demonstration:	2.500	0.000	0.000

This project will demonstrate full-scale Precision Lethality Munition (PLM) variants of the Mk-82 and Miniature Munitions Technology Demonstrator (MMTD) in ground-based static detonation tests to characterize their lethal blast footprint range and predict lethality against personnel and urban buildings. The PLM MMTD will also be demonstrated in normal and oblique concrete penetration tests with an inert payload.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Remote Detection of Suspicious Activity:	2.500	0.000	0.000

To develop and field demonstrate a prototype of an advanced UGS (Unattended Ground Sensor) surveillance system designed for remote detection and reporting of suspicious activities critical to urban warfare and border security. This system will greatly enhance the military's ability to obtain real-time alerts to suspicious activity relating to IED emplacement, crossing of borders at remote locations, personnel movement within urban areas, and firing of weapons, through novel, low-cost, easily deployed, miniature sensor technology.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
M1A1 Tank Commander's 50 Cal Thermal Sight:	0.795	0.000	0.000

The objective of this effort is to integrate a remote thermal sight onto the Commander's Weapon Station (CWS) of the M1A1 Main Battle Tank. The CWS on the M1A1 currently has a day sight that enables the commander to engage targets with the station's machine gun. Because the CWS only has a day sight it limits the effectiveness of the Tank Commander to engage targets during night operations and adverse battlefield conditions. PM Tanks has received and continues to receive user feedback from Operational Iraqi Freedom I and Operational Iraqi Freedom II about this limitation and the need to have a thermal sight capability for the CWS. Under this effort PM Tanks will integrate a remote thermal sight onto the CWS.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Flexible Aerogel Thermal Protection for the HUMMWV:	0.750	0.000	0.000

TACOM is responsible for overseeing the operations of the existing HMMWVs as well as other military vehicles deployed around the world. Up armoring these vehicles results in a tremendous increase in internal vehicle temperatures in which the soldiers must operate (sometime as high as 130 F in the occupant space). The internal temperature rise is from sources such as the engine bay (additional armor weight increases load on the engine) and solar radiation from the sun heating the exterior shell of the vehicle. With the engine heating from within the vehicle and the sun heating from the outside, heat load far exceeds the air conditioning capacity. Troop health, safety and efficiency are significantly impacted under the existing conditions. TACOM is eager to develop and implement solutions to reduce the interior temperature of the HMMWVs currently operating in hostile environments. The objective of this project is to design, analyze, test and qualify an insulation package based on the superior thermal insulation properties of the flexible aerogel blanket material, in order to reduce the HMMWVs internal temperature as described earlier.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Army Tactical Missile - Penetrator (TACMS-P):	3.000	0.000	0.000

The objectives of the TACMS-P ACTD are to develop, integrate, and transition to the warfighter an integrated, military-ready capability to deny, disrupt, or destroy "high value" hard and deeply buried targets.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Tactical RPG Airbag Protection System (TRAPS):	3.500	0.000	0.000

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APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P826**

Develop,integrate and conduct stationary and on the move testing of an airbag system that will detect and defeat RPGs.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Passive Millimeter Wave Imaging System:	1.151	0.000	0.000

Field test prototype passive millimeter wave imaging system to detect and identify suicide bombers. The imaging system detects millimeter waves emitted and reflected from subjects. Clothing is transparent in this wavelength, but weapons (plastics and metals) are not. Device would be used at entry portals, checkpoints or around crowds to detect suicide bombers at a safe range from friendly personnel or critical sites.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Boomerang Power Source:	1.200	0.000	0.000

Design, fabricate, ruggedize and demo a fuel cell generator that would meet power requirements of Generation II Boomerang.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Thermally Adaptive Small Arms Protective Insert Vests (TA-SAPI):	0.100	0.000	0.000

Developmental Testing and Evaluation of The Army Medical Surveillance Agency reported that there were 1,816 heat related injuries to active duty soldiers. The incidence rate was 3.8 per 1000. OIF has added reserve and guard components to the mix, creating the possibility that higher totals will result. The number presented also does not account for the fact that virtually all 135,000 troops serving in OIF are facing these temperature/humidity levels on a daily basis. This project provides a combined capability of armored vest with thermally adaptive vest.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Aircraft Propulsion Risk Reduction:	3.000	0.000	0.000

This Interagency Agreement describes the delineation of responsibility between the Department of Defense (DOD) and the Central Intelligence Agency (CIA) for reducing risk in the development of propulsion systems for air vehicles. This technology will advance the interest of both agencies in accomplishing their respective missions.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Complementary Comb Filters for Night Vision Goggles:	0.250	0.000	0.000

Night vision goggles (NVG) are a key enabling technology allowing our highly-trained personnel enhanced ability to perform tactical operations under the cover of darkness. However, due to their extreme light sensitivity and amplification ability, night vision devices are highly susceptible to negative effects from bright sources of light such as lasers. This project provides complementary protection to each ocular of the NVG while preserving image contrast and scene acuity.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Crossed Dipersion Prism Sensor for Battlespace Threats:	1.250	0.000	0.000

The system utilizes a optical element called the crossed-dispersion prism (CDP), which will simultaneously project the visible, SWIR and MWIR spectra of point targets onto a common focal plane array

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(FPA). By designing the system to have the visible and MWIR spectra displayed orthogonally on the FPA, the system will be spectrally self-calibrating and provide sub-pixel accuracy in the location of point target events.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Suitability Composite for Future LIghtweight Air Platform:	0.250	0.000	0.000
Accomplish a fuselage simulated granite rock impact without airflow or load and with rosette oriented strain gauges.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Component Buy, Long Range Identification (LRID):	0.425	0.000	0.000
The LRID effort has implemented Short Wave InfraRed (SWIR) technology into the current Lightweight Laser Designator Rangefinder (LLDR) production system to provide a man portable extended range target indentification/engagement capability. The LRID system provides either precise far target location coordinates or laser designation of the target for engagement by precision munitions.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Joint Automated Deep Operations Coordination System:	5.200	0.000	0.000
Funds will be used to provide support for the Joint Automated Deep Operations Coordination System (JADOCS). Funds support JADOCS Field Engineers supporting the AOR with OIF and one OEF.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Expendable Unmanned Aerial Vehicle (x-UAV) Payloads:	5.958	0.000	0.000
Provides funds to implement the Joint Staff DEPORD for continued MAKO combat experimentation, and integration, repackaging and in-theater demonstration of payloads upgraded based on "lessons learned" from Phase I of the counter IED "Blitz."			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Wide Area Combustion Detection Systems (WACDS):	1.575	0.000	0.000
These funds will be used to provide improved Fire Reporting in support of USCENTCOM, EUCOM, USPACOM and the United States Army. Funding will provide tools and database development to baseline indications of terrorists activities versus normal activities in support of OIF, Homeland Defense, and GWOT.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Program Support:	0.200	0.000	0.000
Program management support.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007

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Pending QRF Awards:	0.551	0.000	0.000
FY 2005 QRF Proposals under consideration.			
Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
FY 2006/2007 Plans:	0.000	29.241	28.728
The FY 2006 QRF Program Proposal selection process for new start candidates are being finalized and FY 2007 Program data call for new start projects will be fielded in fourth quarter FY 2006.			

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.

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APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P828**

Cost ($ in Millions)		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
P828	Rapid Reaction Fund *Reprogramming Actions	71.697	50.460	50.326	52.053	52.489	52.495	50.180

A. Mission Description and Project Justification: The Quick Reaction Special Projects Program (Program Element 0603826D8Z) QRSP supports three separate projects that provide rapid funding to expedite new development and transition of new technologies to the warfighter: The projects that are part of the QRSP are the Quick Reaction Funding (QRF), Technology Transition Initiative (TTI), and Rapid Reaction Fund. The Defense Acquisition Challenge Program (DACP) transferred in FY 2005 and outyears to PE0604051D8Z.

RRF is fully executed through the Combating Terrorism Technology Task Force (CTTTF). The FY 2005 funding in RRF is the result of internal Reprogramming Actions to allow a rapid response to operations in Iraq and other theaters in support of the Global War on Terrorism (GWOT) and is used to accelerate the transition of high-potential science and technology projects into operationally useful products in the execution years. Beginning in FY 2006, CTTTF seeks to leverage the DoD science and technology base and those of the other Federal Departments; stimulate interagency coordination and cooperation; and accelerate the fielding of capabilities and concepts to counter emerging threats. The task force works to anticipate adversaries' exploitation of technology, including available and advanced capabilities. Additionally, the task force works to exploit technology developed outside of DoD in the commercial sector, in academia and internationally; as well as anticipate adversaries application of available and advanced technology. The average length of a Combating Terrorism Technology Task Force program falls within an 8-12 month range in order to more effectively aid the warfighter.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
IED Detection:	20.759	0.000	0.000
Develop high-risk/high-payoff technologies to improve IED threat detection, beyond the short-term focus of the Joint IED Defeat Task Force. Technologies include: investigation of the interactions between RF signals and common devices used by terrorists; follow-on enhancement of JSTARS technology & initial CONOPS development to support tasking, collection, processing, exploitation and dissemination (TCPED) of Improvised Explosive Device (IED) data and information in the centcom Theater of Operations; enable technology for standoff detection of VBIEDs through analysis of trace/residue explosives on vehicle surfaces using Laser Induced Breakdown Spectroscopy and Raman Spectroscopy; test and assess the operational feasibility of new and emerging sensors against buried weapons caches; Accelerate delivery of capability to detect and develop actionable intelligence on GWOT targets hidden under representative foliage in the SOUTHCOM AOR in near-real time; Develop a taggant easily detectable by canines without being easily detectable by humans; and develop and demonstrate combined 3D ladar and video surveillance in support of counter-insurgency operations to provide continuous wide-area surveillance with airborne video, cueing of high resolution 3D ladar and video, and algorithms to identify and track potentially threatening activities. Projects deployed as an operational capability include acceleration of the Foliage Penetrating (FOPEN) Radar integration into aircraft and the GMTI-Centric Counterinsurgency Operational Demonstration.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
IED Defeat:	2.657	0.000	0.000
Develop high-risk/high-payoff technologies to improve IED threat defeat/pre-detonation capability. Projects that are deployed as an operational capability include Supernova technique development and enhancements to Compass Call aircraft.			

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Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Behavior Analysis:	3.209	0.000	0.000
Develop intelligence capability enhancements, including the operational deployment of the Counter Insurgent Pattern Assessment Program (CIPA) and operationalizing a Predictive Analysis Collaboration Capability (PACC)which provides US Forces the ability to predict and preempt enemy attacks and optimally task ISR forces to focus on areas where activity will likely occur.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Information Fusion & Analysis:	8.055	0.000	0.000
Improve information analysis and fusion capabilities. Includes voice authentication technologies and real-time automated detection of deception and hostile intent. Projects deployed as an operational capability include SKOPE and Mobile Biometrics.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Surveillance and Recon:	16.476	0.000	0.000
Enhance surveillance and reconnaissance capabilities, including broad area MOVINT for backtracking; sensor nodes to enable target, tracking, and locating in denied and potentially hostile areas; and tools and technology to enhance open source data exploitation for CBRN indications and warnings and MASINT collections. Projects deployed as an operational capability include SIGINT collection using digital video recording systems with VSAT communications; and high resolution imagery systems and sensors for UAV applications which provide detection, tracking, and targeting capabilities in denied areas.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Communications / Information:	3.515	0.000	0.000
Communications/information dissemination improvements. Technologies include advanced wireless technologies to make nearly ubiquitous wideband communications possible over a wide area; and antennas which can operate in the extremely low, very low and high frequency bands to interrogating underground facilities, other denied sites, utilities, etc. Projects deployed as an operational capability include a means to harvest data using a compact, low power, lightweight laser communications system; and an Asymmetric Data Retrieval project.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Test Site:	3.442	0.000	0.000
Fielding and CONOPS support for range time and enhancements to the Joint Experimental Range Complex at Yuma Proving Ground.			

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Mission Enhancements:	13.584	0.000	0.000
Other mission enhancement technologies such as a study of the future electronics market (as it relates to IED actuating devices); short wave infrared digital fusion goggles; analysis of U.S. and international law enforcement organizations, the DOJ, and DHS for technologies that are either currently available or sufficiently "mature" (i.e., ready for insertion) and applicable to combating terrorism/countering IEDs; implementation of ADEPT tags to worldwide data processing algorithms, enable meta-data, multi-level information sharing to achieve global maritime domain awareness; development of a low cost, simple-			

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to-operate system that is capable of detecting trace amounts of explosives on human hands; enhancement of NQR explosives detection sensitivity by 1 - 2 orders of magnitude using an RF atomic magnetometer for signal detection; development of multi-nodal unattended ground sensors deployed in a portable, quick to set up system to provide intrusions alerts and images via satellite communications link and to integrate with the Critical Area Protection System (CAPS) for visual assessment to allow timely C2 decisions and response from a central location; development of a wireless WMD vessel boarding/inspection system which provides two way communications, streaming video and sensor data to be transmitted back to host vessel in real time; integration of technologies to protect ships in harbors, port facilities, and restricted waterways from boat or swimmer delivered IEDs; and development of a "removable" undercarriage and door field installable explosive resistant coating protection package.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
FY 2006 Plans:	0.000	48.960	0.000

(U) RRF investment decisions are made during the execution years in response to combatant commander requirements and new threats/new opportunities. To support force protection, investments will likely be made in support of wide area counter-insurgency surveillance of low signal to noise ratio targets, persons and vehicles, perimeters/borders, maritime locations, and denied areas; information exploitation in the areas of biometrics, information operations, open source exploitation, and data mining and correlation; sensors for MASINT and counter sniper capabilities; detection of facilities supporting chemical, biological, radiological and/or nuclear development; detection of CBRN organizational control and persons involved; toxic industrial chemical and material detection; and counter IED initiatives in coordination with the JIEDD TF. In addition to these emphasized areas of concern, other topics will be considered on a case by case basis.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Test Site:	0.000	1.500	0.000

Fielding and CONOPS support for range time and enhancements to the Joint Experimental Range Complex at Yuma Proving Ground.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
FY 2007 Plans:	0.000	0.000	50.326

(U) RRF investment decisions are made during the execution years in response to combatant commander requirements and new threats/new opportunities. research and coordination with organizations and agencies throughout DoD have identified areas as those critical to developing future counterterrorism/counterinsurgency capabilities. These Include: Intelligence capability enhancements; Surveillance and reconnaissance; Training and Education; Tagging, tracking and locating; Communications and information sharing; "Access denial" of insurgents to critical capabilities and needs; Deterrence, Dissuasion and Information Operations; Identification, including Indications and Warnings of threats; Detection of threats, both close in and standoff; Defeat and consequence management; Crisis response capabilities; and Multi-level information sharing. Future programs will focus on developing capability enhancements for these areas

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

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E. Major Performers Not Applicable.

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RDT&E/ Defense Wide BA# 3	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P829**

Cost ($ in Millions)		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
P829	Technology Transition Initiative (TTI)	20.316	29.241	28.728	30.145	31.913	32.662	31.042

A. Mission Description and Project Justification: The Quick Reaction Special Projects Program (Program Element 0603826D8Z) has three sub-elements: the Technology Transition Initiative (TTI), the Quick Reaction Fund (QRF) and the Rapid Reaction Fund (RRF). The fiscal controls above represent the investment of the QRSP Program funding for the TTI Program.

Authorized by Title 10 and Section 215 of the FY2003 Defense Authorization Act, the TTI Program addresses the funding gaps that exist between the time a mature technology is demonstrated and the time it can be funded and procured for use in an intended weapons system or operational capability for the warfighter. Typically, these technologies are completed in the laboratories and shelved until procurement funding is made available by the respective Service to transition the item from S&T base into the acquisition community. The TTI Program facilitates the rapid transition of mature technologies from the S&T base into acquisition programs or directly to procurement. The TTI 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.

TTI projects are selected by the Technology Transition 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 TTI proposals is distributed to the DoD Services and Agencies through the Technology Transition Working Group (TTWG) members, designated by the TTC. The TTWG receives proposals from their Service/Defense Agency S&T base, prioritize them based on Joint, Service or Agency capabilities needed and submits them to the OSD TTI Program Manager. The Technology Manager's senior staff consolidates the proposal submissions, evaluates the Service/Agency recommendations, compares with available resources, and prepares a recommended list to the Technology Transition Manager for funding. The Technology Transition Manager in coordination with the TTC select the highest priority proposals for funding.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
High Altitude Performance Improvements for Global Hawk: (Air Force)	2.682	0.000	0.000

The technology to be transitioned is expected to increase high altitude electrical power generation capability that will provide the Global Hawk with 75 Kilowatt of payload power at high altitude (65,000 feet). This is triple the current onboard power capability and allows the Global Hawk to support planned payloads that cannot be supported with the existing power system. The improved electrical power generation provides the additional power for the Global Hawk system to meet Mission Area Needs for expanded data fusion, ground/airborne target ID, and EO/IR countermeasures. The proposed concept extracts power from the AE3007 engine's low pressure (LP) turbine instead of the high pressure (HP) turbine. LP spool power extraction versus HP spool power extraction enables the Global Hawk to achieve U-2 sensor parity. The system benefits to Global Hawk of LP spool power extraction relative to HP spool power extraction are: 5.1% increase in endurance, 6.7% increase in maximum altitude, and 4.2% increase in range. The TTI initiative accelerates the transition of this technology by 24 months. FY 2005 Accomplishments: Installed LP Generator on AE 3007H and performed calibration runs at Allison Advanced Development Company (AADC); shipped engine-generator set to Arnold Advanced Development Center (AEDC) and performed altitude tests. Pretest engine calibration runs began at AADC on 13 June 2005. Conducted altitude test in July 2005 at AEDC. Post test assessment and then begin planned integration on Global Hawk.

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Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Automated Change Detection: (Army)	1.665	1.800	0.000

This effort accelerates transition of an automated change detection capability from the Joint Area Clearance (JAC) ACTD into the U.S. Army, Airborne Standoff Minefield Detection (ASTAMIDS) and Ground Standoff Minefield Detection (GSTAMIDS) programs. This new capability will be used by the warfighter to address a critical need to rapidly identify and locate landmines and improvised explosive devices (IEDs) along routes. The CERDEC-NVESD Change Detection Workstation (CDWS) has been demonstrated under the JAC ACTD and consists of a field-portable workstation with user-friendly interface that supports the detection of recently buried mines by means of change detection. The system can accept a wide variety of imagery from various sensors. The current configuration is dependent upon an operator to analyze, process, and identify possible landmine and IED signatures in the imagery. This effort will automate the change detection process by adding an algorithm designed to detect landmines and IEDs which will significantly increase the detection rate. TTI project accelerated a capability into current operations 12-24 months faster and accelerated a capability from the JAC ACTD into acquisition 18-24 months sooner. Based on CTTTF results and TTI progress, the USMC requested five (5) Change Detection systems for use with their UH-1N helicopters and F/A-18 fixed wing aircraft. FY 2005 Accomplishments: Acceleration into Current Operations- Transitioned automated image ingest and registration change detection products from this TTI program into the Marine Corps F/A18D Advanced Airborne Tactical Reconnaissance system which is currently at Al Asad Airbase in Iraq since February 2005. Completed automated ingest and registration products for Army Helicopter sensor POD system being developed for OIF IED detection capability. Acceleration into ASTAMIDS Program - Conducted significant data collections of IED targets to facilitate refinement of image registration and automated target cueing algorithms for ASTAMIDS program. FY 2006 Plans: Transition continuously improving TTI automated change detection products into systems that are deployed to OIF and into Marine Corps squadrons that are on deck to deploy into OIF. Possibly field Army helicopter sensor pod for IED detection capability into current operations. Continue data collection (real-world) to enhance database of target geometries, essential for refinement of registration and cueing algorithms for detection of roadside threats. Continue efforts to mature automated target cueing algorithms and complete automated ingest and registration capability for the ASTAMIDS program. Capability will transition to Project Manager for Close Combat Systems (PM-CCS) into ASTAMIDS program.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Seal Delivery Vehicle (SDV) Advanced Reconnaissance System (ARS): (USSOCOM)	0.430	0.000	0.000

The SDV ARS project is developing a stabilized low light color video camera and thermal imager configured in a MK 8 MOD 1 SDV-compatible mast-mounted device. The system will provide SDV operators the ability to clandestinely maintain situational awareness, while tracking, recording and storing target data in the SDV. The project is being executed under a US/UK Cooperative R&D agreement established in FY 2002. The reconnaissance and surveillance Modular Mast Device will be configured as a Mission Kit that will include: (1) the periscope controller, which provides required computer processing, interface and controller boards, recording media, and a monitor for viewing imagery, (2) interfaces, connectivity and cabling between the camera control unit and the camera unit, as well as ports or plugs for interface to future transmission or storage devices, and (3) a camera, which provides a mast-mounted image capture device. The SDV ARS project's advances include camera stabilization in Sea State 3 conditions and use of uncooled IR microbolometer technology. FY 2005 Accomplishments: Fabricated periscope controller with engineering enhancements. Obtained camera (EO Sensor) from contractor. Completing testing and expecting handoff to SDV Teams imminently. Obtain updated Statement of Need from NSW G-3. Achieve Milestone B Approval. Transition SDV ARS Kits under SDV Program.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Wide Field of View Goggles (WFOV): (USSOCOM)	0.655	0.000	0.000

The goal of the Night Vision Electro-Optics (NVEO) project is to improve operator night vision devices with respect to increased range, magnification, field of view (FOV), sensitivity, and resolution, during periods of both good and limited visibility. Project technologies that can be applied to existing night vision goggles (NVG) through modifications or retrofit. Initial efforts focused on increasing the FOV and anti-blooming technologies. The NVEO project will create a Wide Field of View (WFOV) goggle with a 2.5X increase in field-of-view over current 40° NVGs, utilize improved image intensifier tubes with increased sensitivity and reduced blooming and halos effects. The goggle incorporates innovative features such as a universal helmet mounting scheme, hard carrying case, and eyepiece bumpers to protect the

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lens of protective eyewear. These WFOV goggles, which have been developed in two phases, have the potential to replace all current SOF ground operator NVGs. Funding support from the TTI Program accelerated the WFOV NVG capability by three to four years.

FY 2005 Accomplishments: Redesign of the WFOV NVG goggle was completed, production tooling was developed and fabricated, and material was ordered to deliver Low Rate Initial Production units. Final design met all the user goals to include a 66 foot submersion capability, two helmet mount adapters, hard carrying case, and removable eyepiece bumpers. Efforts achieved a design that addresses human factors considerations like neck fatigue, leveraging standard image intensifier tubes, and interoperability with existing soldier systems.

The requirement for a wider field-of-view NVG, specifically the WFOV NVG, was incorporated into SOCOM's Monocular/Binocular Capability Development Document (CDD). This document serves as the basis for start of an acquisition program. The Life Cycle Cost Estimate (LCCE) for the WFOV NVG program was developed. The Single Acquisition Management Plan (SAMP) was initiated.

FY2005 Accomplishments: The delivery of the LRIP goggles to support Operational Testing and User evaluations. Evaluations to be completed within three months of receipt of the systems. Results of the tests and evaluations will be provided to SOCOM PEO-SP for their decision to purchase the new goggle system.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Accelerate Transition of Area Security Operations Command & Control (ASOCC): (DISA)	0.225	0.000	0.000

The Coalition Rear Area Security Operations Command and Control (CRASOC2)/ASOCC system integrates information technology (IT) tools critical to Anti-Terrorism/Force Protection (AT/FP) missions. The system provides assured Command and Control (C2) to forward bases around the world and ties together information and data from DoD, the Intelligence Community (IC), Federal Agencies, and Force Commanders. The ASOCC system integrates numerous COTS and GOTS components including: (a) Deployment Visualization Toolkit (DVT), (b) Java Imagery Video Exploitation (JIVE), (c) Defense Collaboration Tool Suite (DCTS), (d) Knowledge Board (KB), (e) eX-Panel, (f) eXtensible Information System (XIS) and Adaptive Battlespace Awareness Common Operational Picture (COP), (g) Baseline Microsoft Suite, and (h) Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF) documentation. FY 2005 Accomplishments: Conducted ASOCC System Hardening. Distributed ASOCC system to Combatant Commanders/ Services. Conducted Joint Military Utility Assessment (JMUA). Transition system to Global Command and Control System (GCCS) and Joint Command and Control.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Semantic Web Network: (Joint w/NGA and USMC):	0.710	0.000	0.000

An XML-based content routing system technology that enhances Command and Control (C2) by delivering more relevant and complete information from across Intel Community (IC) databases in real-time matured faster than expected and is now ready for transition to the Marine Corp System Command (MARCORSYSCOM), Marine Expeditionary Force-Intelligence Analysis System (MEF-IAS). The USMC wants to deploy this technology as part of current combat operations. Extensive functional testing of the capability was accomplished during the Joint Warrior Interoperability Demonstration (JWID) in June 2003. The TTI funding will support two phases (Phase II and III) of the Semantic MEF IAS Integration, Testing and Transition to Operational Forces program by enabling combat readiness testing and support of the deployed system. Phase Two will integrate the Tactical/National Integrated Environment (CPX) with the Semantic Web capability across the SIPRNet at the Marine Corp Intelligence Activity (MCIA). In addition, it will evaluate integrated data access to MCIA and other IC databases for Rapid Response Planning Process (R2P2) requirements. Finally, Phase Two will combine tactical, operational, and national IC resources with critical command and control information results for unprecedented level of streamlined intelligence support to operations. Phase III will deliver two Equipment Suites and Software Licenses to the MEF-IAS. The resulting system will reduce search times and allow the warfighter more time for collaborative planning and course of action analysis and deployment. FY 2005 Accomplishments: Completed transition of Phase III of the Semantic MEF IAS Integration, Testing and Transition of the technology to 3rd MEF by enabling combat readiness testing in support of the deployed system to Okinawa, Japan.

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Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Ultra Long End Power Generation for Battlefield Air Operations (BAO) Special Ops Warfighter: (Air Force)	0.710	0.000	0.000

During a typical deployment, the BAO Special Tactics Warfighter will often need to jump into a forward position carrying more than their body weight in equipment and support ancillaries. The batteries required to support these devices represent a hefty and expensive component of the BAO kit. In an example 72 hour mission, total power consumption of the BAO kit is expected to be approximately 2200 watts/hour. If this power were to be supplied conventionally via BA-5590s then 13 separate batteries would be required, translating into more than 29 lbs. The TTI project will incorporate inexpensive, injection-molded fuel cell technology into a common BA-5590 form factor which can easily be included in to the PRC-117 field radio, which is an essential part of the BAO kit. If this technology were adopted, then the power weight required to complete the example 72 hour mission would drop by more than 13 lbs. FY 2005 Accomplishments: Multiple integrated fuel cell portable power systems were delivered in February 2005 employing chemical hydride energy storage. Detailed testing is underway at AFRL, however, cursory Navy (Crain) tests indicate that energy densities of 2X BA-5590s were achieved. Some early prototypes demonstrated some refill cartridge engineering issues, but a solution was identified and will be incorporated into next generation units. Generation 2 units are under construction. Both the Army (ARL) and the USAF will evaluate Generation 2 prototypes. The objectives of this deliverable will be to demonstrate a 40% reduction in system weight, a 50% reduction in cost with an increase in operator capability. Device will be transitioned to the Battlefield Air Operations kit as part of the Battlefield Renewable Integrated Tactical Energy System (BRITES).

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Advanced Lightweight Ceramic-Based Armor: (Air Force)	1.685	0.576	1.120

The availability of lightweight modern Small Arms Protective Insert (SAPI) body armor has been a critical issue in the Iraqi battle theater. The Air Force and Navy in-house R&D programs working in collaboration with Excera Materials Group of Columbus, Ohio (via Phase I and II SBIR's) have developed a novel ceramic strike face material for use in armor systems. The material has been used in conjunction with traditional polymer-based backing and has passed first article testing by the Army PM. Furthermore, the Army has issued purchase orders for ceramic strike faces that contain the first generation of these materials. Excera has developed a robust manufacturing process concurrently with the material. As a result they have a lightweight, high ballistic performance system that has several manufacturing advantages over traditional armor ceramics. Specifically, the material has a lower manufacturing cost and is easily shaped to meet complex human or vehicle contours. The work proposed in this TTI project will allow for wider availability of this material across the various Agencies and increase its range of capability (i.e., increased ballistic threats) and application (i.e., advanced personnel, vehicle, etc.). Through funding provided under this TTI project, it is estimated to accelerate transition 24 months sooner than originally planned. FY 2005 Accomplishments: Designed new Side of Body Armor (Side of Body Protective Inserts - SOBPI) plates for specific Air Force requirements of the 20th Air Support Operations Squadron (ASOS) attached to the Army's 10th Mountain Division. Delivered 10 sets of SOBPI plates to the 20th ASOS - system currently fielded in Iraq - TRANSITION. Delivered 26 sets of SOBPI to the 88th Security Forces Squadron deploying to Mosul, Iraq 10 July 2005. - TRANSITION. Designed extra damage tolerant SAPI plates - aka "Super SAPI" or sSAPI. Delivered 54 sets of sSAPI plates to AFRL Det 1 to cover all of their mobility personnel. Plates are currently fielded on AEF deployments - TRANSITION. Designed Enhanced SAPI (eSAPI) system to defeat BZ API round and M2AP 0.30 cal AP round. Designed lightweight armor plate system (lighter than SAPI) for Air Force Special Operations Command - prototypes delivered mid Aug 2005. Designed appendage armor SAPI system for a Marine Corps requirement - prototypes delivered mid Aug 2005. Developed new manufacturing processes to increase throughput to 2500 SAPI plates/month. Developed 100% inspection criteria to increase quality assurance of all delivered armor products. FY 2006 Plans: Continue the development of SAPI materials to meet new and emerging threats as outlined by the Army PM shop and the Marine Corps lead for personal protection. Continue work with SOCOM to outline Special Operations specific armor requirements. Deliver appendage armor solutions to Marine Corps. Qualify another industrial source of eSAPI plates for delivery of eSAPI to both the Army and Marine Corps. Increase production of SAPI plates (SAPI, iSAPI, eSAPI and sSAPI) to 5,000 plates per month. Develop lightweight tactical vehicle armor based on the SAPI material and design as per emerging DoD requirements. FY 2007 Plans: Increase production of SAPI plates (SAPI, iSAPI, eSAPI and sSAPI) to 10,000 plates per month. Develop capacity to deliver 20,000 sets of appendage armor per month to Army, Marine Corps and Air Force. Continue to work with lightweight vehicle manufacturers to develop platform specific packages responding to the current threat levels. The current TTI program ends May 2007.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Countermeasures Protection System (CMPS): (Army)	2.220	0.000	0.000

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The CMPS is a field-programmable Electronic Countermeasures (ECM) system designed to provide force protection against Remote Controlled Improvised Explosive Devices (RCIEDs). The CMPS utilizes a new architecture optimized to defeat both categories of threats, includes multiple upgrades, and is field-programmable. The programming feature provides the crucial capability for gaining units to tailor countermeasures as required during the mission. The CMPS is a vehicle mounted system, thus meeting all elements of the ONS requirement. The prototype system used components currently not mechanically or electronically ruggedized or in a form factor and function for the harsh environment of the intended theater of operation. Further technique development and resource expansion are required to increase the system's capability to meet full Operational Needs Statement (ONS) requirements. It is estimated that TTI Program funding will accelerate these efforts by 6 months. FY 2005 Accomplishments: The CMPS system has transitioned to Program Manager-Signal Warfare (PM-SW) and is being procured in a slightly modified form under the CREW-2 program. Completed ruggedization, the refinement of techniques, and resource expansion, while maintaining and potentially reducing size, weight, and power of the system. TTI funding, in part, supported and accelerated this transition. TTI funding supported engineering research and development in direct support of the CREW-2 program in the areas of threat analysis and device development and evaluation. System transitioned to PM Signal Warfare end of FY 2005.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Command Post of Future (CPOF) and Army Battle Command System (ABCS) Server Software Integration: (Joint w/Army/USMC)	1.665	1.200	1.345

The Command Post of the Future (CPoF) is a high priority DARPA-sponsored technology program that will provide a suite of collaboration tools used as an executive decision support system from Corps down through Battalion. CPoF successfully supported the 1st Cavalry Division in GWOT operations during OIF with a 50 user network. This network expanded to a 200 user network with the 3rd Infantry Division for OIF 3 and the 4th Infantry Division for OIF 4. CPoF is scheduled to transition directly to the Army Acquisition community in 2006 based on a formal agreement between Army G-3 and DARPA. The current CPoF system consists of both clients and servers. In the near/mid-term OIF rotations, CPoF hardware will be fielded side-by-side with ABCS hardware. CPoF is currently scheduled to transition to Project Manager Ground Combat C2 (PM GCC2) under PEO C3T in 2006. The TTI Program will bridge this three year gap in funding. TTI Program funding will accelerate the merger and integration of CPoF server software and ABCS Information Server (AIS) software by at least one year, driving an initial battle command server consolidation focused-activity that will expedite the elimination of additional hardware in the field. FY 2005 Accomplishments: Documented CPOF Server software development environment, server configuration guide, client-server interface design and APIs, and internal (CSCI) interfaces. Initiated comparative analysis of evolving CPOF and AIS server functionality, processes, and data threads in terms of overall battle command server consolidation review. FY 2006 Plans: Continue comparative analysis against final CPOF and AIS V6.4 Server software builds. Define and document target system architecture operating environment. Define and document unified battle command server target software and hardware environments. Initiate and examine software coexistence and integration approaches. Develop initial CPOF-federated and battle command server software prototype builds. Test, evaluate, and analyze CPOF-federated and battle command server prototype performance and identify critical-path technical risk areas. FY 2007 Plans: Develop courses of action and conduct ongoing analysis of technical alternatives to simplify initial CPOF-federated and battle command server software code, processes, and interfaces. Generate subsequent unified battle command server software builds and test/evaluate/analyze via the spiral software development process.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Digital Planning Tools for Joint Ground Warfare: (Army)	1.120	0.720	0.000

The Agile Commander ATD has successfully built digital planning solutions for the Army that are being used throughout the Service. The primary product, CAPES, was identified as one of the non-ABCS "good enough" systems and was selected as one of the "10 greatest AMC achievements" for 2002. The focus of this TTI project is to use proven planning and decision support solutions from Agile Commander and CAPES to transition a planning capability for Joint Forces via the Joint Common Tactical Workstation (JCTW). A number of units are using CAPES today. Units that have taken CAPES to Iraq have generated a list of desired features to support SASO and MOUT operations. USFK has generated a list of joint capabilities that would facilitate Ground Component planning in theater. These requests clearly indicate a warfighter need, and are an indication that CAPES provides value in many types of operations. CAPES is currently scheduled for integration with the Joint Common Tactical Workstation during FY 2005. TTI Program funding will allow a full and complete integration of CAPES, including Joint planning tools requested by USFK, and SASO/MOUT features requested by 18 ABC, 101st, III Corps, and 4 ID into JCTW by FY 2006. TTI Program funding will accelerate the fielding of digital planning solutions for Joint Ground Warfare by at least one year. FY 2005 Accomplishments: Conducted analysis of CAPES infrastructure and applications to complete modifications allowing for integration of CAPES into JCTW. FY 2006 Plans: Incorporate requested SASO and MOUT features into

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JCTW. Transition JCTW to the Program Manager for the Army's Maneuver Control System (PM-MCS) and the U.S. Marine Corps Command and Control Personal Computer (C2PC) Programs.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Integrated Precision Underwater Mapping (I-PUMA) Sonar for Small UUVs: (Navy)	1.110	1.200	0.000

This project will provide area search, mapping, and target identification capabilities in very shallow water, harbor, port, and ship berthing environments. This will be accomplished by engineering the submarine precision underwater mapping (PUMA) and 21" UUV Littoral-PUMA (L-PUMA) sensing technologies into a miniaturized integrated-PUMA (i-PUMA) that is capable of operating in these shallow areas on a 12" UUV. The engineering effort will develop an integrated sensor/processing design that minimizes the overall power requirements and unit cost, while providing an upgrade path for additional capabilities. In addition to integrating i-PUMA with a small UUV, this project will also develop object detection processing and vehicle processing suites to enable wide area search with change detection and target identification. The i-PUMA sensor suite will provide a substantial advance over currently available candidate technologies, breaking the current narrow-width, single-target aspect, sensing paradigm and permitting wide field of view, multi-aspect bottom mapping and object detection at high resolution. The sensor will enable a small easily deployable UUV to efficiently search large areas to a specified level of confidence. FY 2005 Accomplishments: Project was a mid-year start (May 2005). Began ahead-look sonar (ALS) system design optimization. FY 2006 Plans: Begin array/processing development, object detection and discrimination processing, and mission path planner development. Complete ALS system design optimization. Add UUV integration planning task to be completed in FY 2006. Complete sonar/array processing development, integration, and testing in Lake Travis. Complete object detection and discrimination processing. Complete mission path planner development. Complete UUV hardware/software integration and in-water testing/evaluation.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Swimmer Defense: (Navy)	0.666	1.440	0.000

Terrorist attacks have heightened the level of interest in enhancing maritime military force protection. An easily deployable system is needed to provide ships with the real time capability to detect and engage swimmers or divers that pose a threat to high value assets while in port or at anchor. Both the Navy and the Coast Guard have identified swimmer detection (SD) and swimmer engagement (SE) as critical, high priority capability gaps. Swimmer Defense is designed to provide an integrated capability for swimmer detection and engagement, which does not exist today. Swimmer Defense has been identified as a potential spiral development system to be integrated into the Navy Shipboard Protection System (SPS). The current SPS configuration, scheduled to be fielded in FY2005, contains only the Integrated Radar Optical Surveillance and Sighting System (IROS3) which is only intended for use as a detection system for potentially hostile small craft. The TTI initiative will transition SD and SE system technology to acquisition and support the procurement of an additional test article allowing for multiple sonar head interface development, thus reducing the time to field the end item by one to two years. Multiple sonar heads are required to protect large ships in foreign ports and anchorages. TTI funding for SE will allow for testing of two acoustic impulse systems. FY 2005 Accomplishments: Project was a late start (Fourth quarter FY 2005). Defined swimmer defense requirements and develop CONOPS. Initiated system characterization tests. FY 2006 Plans: Complete system characterization tests and conduct design update. Begin fabrication of full scale prototype. Conduct prototype testing. If successful, transition SD and SE technology to Shipboard Protection System.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Special Ops Forces (SOF) Virtual Interpreter: (USSOCOM)	0.555	0.720	0.000

The SOF Virtual Intrepreter (SVI) involves four different technologies: the Phraselator, the Foreign Language tutorial software, the voice to voice translator and the NIPRNET Connectivity. The Phraselator is a ruggedized, one-way, voice-to-voice, handheld translation device designed specifically for the US Military. Since the Phraselator's prototype launched in 2001, it has been used by American Soldiers worldwide more than any other translation device. The Phraselator is a field-proven force multiplier capable of gaining intelligence, providing life-saving direction and enabling civilian outreach efforts. A substantial new capability (not currently available in the Phraselator) is the ability for the software to record and translate a foreign language response back into English. A two-way capability allowing for the gathering of invaluable time sensitive intelligence information or in a medical emergency scenario it would assist in the assessment of a non-English speaking patient's severity of wounds or ailment. Additional capabilities such as communications and language tutorial software would enhance the user's abilities to reach back through the World-Wide-Web to obtain system upgrades and conduct language

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training from abroad. The goal of this effort is to enhance and transition twenty (20) SOF Virtual Interpreters (SVI) Systems with the following technology modifications for evaluation by USSOCOM forces and others to effect a rapid transition into acquisition. FY 2005 Accomplishments: One Way Translator -- Communications "Plug" hardware and software design completed. Completed user communications interface software design. Evaluating Onboard training and web based E-Learn tools. SOCOM PEO assessing production capability. Two Way Translator -- Successful demonstration of platform independence. Successful user interface improvement. Ongoing comparative evaluation by ARL and NAVAIR. Participating in JFCOM effort. FY 2006 Plans: Down select two-way hardware and software. Integrate selected technologies into platform. Anticipate Operational Testing in first quarter FY 2006 by USASOC. Anticipate combined Developmental Testing/Operational Testing first quarter FY 2006 by ATEC. Field test deliverables. The SOF VI will transition to the Machine Basled Language Translator Program (MBLT) Program of Record. The SOF VI is expected to be inserted into the joint service (S-FLTS) increment 1 transition plan.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Rugged ENTR Device (RED): (USSOCOM)	2.442	0.000	0.000

The Embedded National Tactical Receiver (ENTR) provides the tactical warfighter with a small, low cost, low power, near-real-time, intelligence data reception capability. It will simultaneously receive, demodulate, and decrypt four independent, Integrated Broadcast Service (IBS) broadcast channels. The IBS architecture disseminates strategic, operational, and tactical intelligence and information to the warfighter. The ENTR form factor allows it to be embedded directly into a variety of host systems (e.g., workstation, laptop, tactical radio). The objective of this TTI is to integrate the ENTR circuit card and IBS message processing software into a rugged, tactical, IBS receiver system, referred to as the Rugged ENTR Device (RED). RED will be the next generation, technological advancement to fulfill an approaching gap in capability by replacing obsolete and aging legacy IBS receiver systems throughout the Department of Defense (DOD). Unlike most legacy IBS receiver systems, RED also supports the IBS migration to the Common Interactive Broadcast (CIB) and mandated DOD Cryptographic Modernization directives. RED will support air-, ground-, and maritime-based missions in a single, rugged, lightweight package. Supporting multiple platforms and environments in a single design will significantly reduce life cycle management costs and redundant development efforts. FY 2005 Accomplishments: Performed environmental analyses to complete the non-recurring engineering (NRE) of the RED prototypes. Began the NRE development to productize the design and meet the RED performance specification.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Lightweight and Conformal Photovoltaic Solutions for the SOF Warrior: (USSOCOM)	0.555	0.745	0.000

The photovoltaic (PV) technologies, being offered through the U. S. Army's Natick Soldier Center (NSC), will provide our SOF operators with unique power generating PV textile systems that are lightweight, conformable, versatile and stealthy for renewable power and potential electronics integration into C4ISR systems and mobile/fixed site systems currently used by SOF forces. Lightweight and conformal PV systems can be integrated into SOF Warrior Systems where many surfaces could be utilized as areas for power generation. These SOF PV systems could include, but are not limited to; unattended ground sensors, tags, command and control equipment (handheld radios), weapons sights, unmanned ground and aerial vehicles, shelter overheads, portable mats, manned ground and maritime platforms, etc. As such, flexible PV technology offers the SOF operator an unsurpassed versatility for use as a direct energy source and/or battery recharging (hybrid systems) to complement legacy generator and battery systems. The FY 2005 TTI project is focusing on three prototype / initial production PV devices for lightweight and renewable power generation using two different PV technologies (developed under Phase I and II SBIR Projects with Iowa Thin Film - Amorphous Silicon and Konarka Technologies - Dye Nanocomposites). The three PV units include: a) AA battery rechargers -- mini-pocket size and rollable portable solar panels; b) PV's for remote sensing - support 5, 10, and 25 Amp/Hour power loads for sensors and remote sensor workstations, c) Determine surface area requirements and moldability/conformal nature of PV technologies to meet operational uses. FY 2005 Accomplishments: PV AA Battery Recharger: Procured and delivered one thousand (1000) PV powered AA battery recharger prototypes for testing under a tight 12 week delivery schedule. Conducted operational test and evaluation of PV powered AA battery recharger prototypes utilizing Operational Forces Interface Group (OFIG) expertise. Determined utility for continued SOF use. Camouflage-Pattern/Dye Sensitization Initiatives: Conducted research on development of new dyes and ink jet printing to fabricate camo-patterned photovoltaics for minimal visible signature and stealthy power generation using dye sensitized nanocomposite PV technology. PV Conformability: Conducted tests to determine moldability/conformability of PV to surface area requirements and shapes needed for operational use. FY 2006 Plans: PV Conformability and Camouflage-Pattern/Dye Sensitization Initiatives: Develop and refine prototype systems for use and evaluation by Program Executive Office - Intelligence and Information Systems (PEO-IIS) representatives based on FY2005 conformability findings. Conduct operational test and evaluation of prototype

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PV using operational user energy system. Analyze, test and evaluate data. Develop final report and recommend way ahead strategy on all PV items evaluated. System transition is planned for USSOCOM PEO-IIS.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Tapecast Production of Thermal Battery Electrodes for Missiles: (MDA)	0.555	0.000	0.000

Thermal batteries are used for in-flight power by almost all weapon systems. Tactical applications include smart bombs, smart munitions, cruise missiles, air-to-air missiles, ground launched tactical missiles, and intercontinental ballistic missiles. All of these thermal batteries incorporate cell component pellets: anodes, cathodes, separators and heat pellets. Thermal batteries only produce electrical current when the electrolyte is in the molten state. Traditionally, thermal batteries are made by cold-pressing various powders into thin electrode disks that form electrochemical cells. This process is time consuming and the fragility of the pellets results in defects that sometimes cannot be detected by screening tests. This results in low production yields and the potential for reduced reliability in some battery designs. Tapecasting applies the powder materials in a slurry to sheets that can be easily cut into electrodes. This simplified production method has been demonstrated at the laboratory level, and is projected to achieve both cost savings and improved performance. This technique would be used to improve the performance of all thermal battery designs. Several emerging military applications are signaling the need for thermal batteries that are capable of providing high power and longer duration power than are currently available. These state-of-the-art requirements dictate the need for thin cell components that optimize high power performance and increase the duration that power will be provided. Thermal batteries are up to ten times less expensive to manufacture compared to the large size lithium liquid reserve batteries. The new thermal battery that will be produced and tested under this Technology Transition Initiative will be procured under the Capabilities Enhancement II procurement beginning in January 2006. The new thermal battery will undergo rigorous qualification testing and then be flown on Integrated Flight Tests and installed on production interceptors to be placed on operational status. Successful development of this technique of thermal battery production can be implemented on thermal batteries for other systems. FY 2005 Accomplishments: Project was a mid-year start (May 2005). Began fabrication of production quality batteries by enabling the demonstration-level process to begin transition to production. Initiated qualification testing to be performed concurrently. FY 2005 Plans: Complete qualification testing and thermal battery production. Thermal batteries produced under this TTI effort will transition to the Ground Based Interceptor (GBI) Project Management Office

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Accelerated Transition of Shelf Stable Sandwich: (Army)	0.666	0.000	0.000

Advanced development prototype shelf-stable sandwiches pioneered by Natick Soldier Center (NSC) incorporate novel processing, packaging, stabilization and preservation technologies. These prototype sandwiches will form the cornerstone of new items for the Meal-Ready-to-Eat (MRE) and future operational rations such as First Strike Ration (FSR). These sandwiches include barbecue chicken, barbecue beef, Italian pocket (pepperoni & sausage in tomato sauce), pepperoni, peanut butter & jelly, and nacho cheese flavored beef varieties. These sandwiches are developed using hurdle technologies that utilize a series of processing barriers to inhibit the growth of organisms (bacteria, yeast and mold). This concept for eat-out-of-hand items directly supports Army doctrine and implementation of the Army's Future Force designed to be strategically responsive and agile for rapid mission tailoring, crisis response, stability and support operations, and extended regional engagement. Individual soldier survivability, sustainability and combat effectiveness is the centerpiece for transforming the Army of the 21st Century to ensure a soldier centric Future Force. The insertion of TTI Program funding will accelerate transition to production by an estimated 8-12 months. FY2005 Accomplishments: Project was a mid-year start (May 2005). Performed large-scale production trials to optimize production capability of advanced prototype pocket sandwiches. This optimization and scale-up will thoroughly analyze critical hazard analyses and critical control points such as temperature, time, and water activity during various stages of mixing, baking, processing, and subsequent assembly and packaging of individual components. Expanded production base capability and investigated alternative processing methods and technologies to ensure a viable production capability exists to satisfy MRE surge requirements as was required during FY2003 in support of SWA operations. Transition technology/process to DLA supported by Military Personnel Army Subsistence in Kind program funding.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Husky Mounted IED and Anti-Tank Mine Detection System: (Army)	0.000	4.200	1.575

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APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
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This two year TTI project will insert the NIITEK GPR onto the commercial-off-the-shelf Husky vehicle to upgrade its threat detection capabilities. The transitioning technology is the NIITEK mine detection ground penetrating radar (GPR). This GPR is a breakthrough in mine detection that achieves very high detection against all types of anti-tank (AT) mines while maintaining an extremely low false alarm rate. This technology affords the opportunity to get out in front of the evolving threat by providing the capability to detect plastic low metal mines as well as large buried explosive charges, explosively formed penetrators (EFPs), or IED's that do not contain metal. FY 2006 Plans: Design overall detection architecture; Produce one set of mounting, stowage and height control hardware; Produce two 1.2-meter prototype NIITEK GPR arrays (one unit); Produce one marking sub-system; Integrate computers and operator interface; Begin integration of system components on Husky. FY 2007 Plans: Complete integration of system components on Husky; Improve mine detection algorithm suite with algorithms for detecting ordnance based IEDs; Produce manuals, training package, and selected spare parts; Conduct data collections, demonstrations, tests and evaluations; Transition to Project Manager-Close Combat Systems.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Red Blood Cell Extended Life (RBCXL) : (Army)	0.000	1.200	1.050

The objective of this project is to complete development and fielding of a new blood collection and storage system that is approved by the Food and Drug Administration (FDA) and that provides the capability to store and maintain human red blood cells (RBCs) at an FDA-defined level of functionality and safety for at least 8 weeks and potentially for up to 12 weeks. With TTI funding, transition of this blood collection and storage system can be completed in four years or less.
FY 2006 Plans: Prepare Cooperative Agreement between Hemerus Medical, LLC and Government; Finalize blood bag set design with the leukoreduction filter; Produce blood bag set for preclinical and clinical trials; Finalize trial protocols and enroll site for the studies; Initiate preclinical studies; Submit and obtain IND approval for clinical studies.
FY 2007 Plans: Initiate and complete clinical studies; Prepare final report. Submit Biological License Application to the FDA; Obtain Biological License for the extended red blood cell storage (>= 8 weeks).

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Unmanned Surface Vehicles for Littoral Combat Ship Missions: (Navy)	0.000	1.200	2.100

The Unmanned Sea Surface Vehicle (USSV) is a prototype vessel. This prototype vessel was purpose-built to carry Littoral Combat Ship (LCS) mission payloads and demonstrate enhanced capabilities relative to existing USV technology. These enhanced capabilities will be a key enabler of LCS's ability to perform its three primary missions of Mine Countermeasures (MCM), Anti-Submarine Warfare (ASW) and Surface Warfare (SuW), as well as other LCS missions such as Expanded Maritime Interception Operations (EMIO) and Electronic Warfare (EW). TTI Program funding will provide the final level of maturity to transition the USSV to PMS420 and acquisition for deployment on the LCS. This TTI program will accelerate development of the USSV so that it can be incorporated into LCS Flight 0 in 2007, which represents a two-year acceleration compared to the current PMS420 plan.
FY 2006 Plans: Initiate Preliminary Integration and Test of USSV Mine Influence System; identify Payload Definition, determine USSV Design/Build or Modify to accept the ASW payload.
FY 2007 Plans Conduct USSV performance testing; perform Payload Integration; conduct Mine Influence/USSV At-Sea Test:; conduct ASW Payload/USSV At-Sea Test; Deliver to LCS.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Operational Gliders for Battlespace Reconnaissance and USV Surveillance: (Navy)	0.000	2.280	1.995

The basic CONOPS for ASW is for networks of gliders to obtain data to reduce the uncertainty in the performance prediction of the acoustic sensors by providing near real-time 3-D acoustic properties of the ocean, including sonic layer depth, ducting conditions and sound channel characteristics. Networks of gliders together with distributed networked bottom sensors reduce the occurrence of false contacts. Optical sensors facilitate non-acoustic Anti-Submarine Warfare (ASW) measurements. Groups of 5-10 gliders can establish a real-time (reporting) environmental sensing network in the operational area of interest and provide the Anti-Submarine Warfare (ASW), Undersea Warfare (USW) and Naval Special Warfare (NSW) communities with the data to support their mission planning and tactical decision aids (TDAs). The evolving CONOPS for NSW is to acquire the environmental data to provide mission planning modules with the initial and evolving shallow water environment. Data on optical clarity, location of rip currents, accurate bathymetry and the 3-D temperature field are important mission constraints for special operations. The gliders together with other autonomous vehicles (such as SAHRV) can provide

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the water temperature, currents, and depth to the embedded environmental reconnaissance teams for mission planning. Operational fleet commands are the immediate beneficiaries of the data collected by gliders. The maturation of gliders will require up to six years for building platforms and performing the engineering and development to reach operational standards. TTI Program funding will allow the glider to reach a level of readiness 36 months earlier.
FY 2006 Plans: Design common command and control software system for use with all the different variants of gliders from one terminal. Integrate adaptive sampling algorithms into the control system as an option for optimizing the piloting for ASW objectives. Standardize and test battery systems (battery packs, configurations, safety systems) to obtain extended glider flight duration and approval for use on Naval vessels. Initiate redesign of glider wings and antenna to withstand the shock of retrieval and deployment. Several designs ready to be constructed and tested. Construct prototypes to facilitate NAVSEA and at-sea testing. FY 2007 Plans: Conduct lab testing of prototypes to meet NAVSEA approvals for surface and subsurface vessels. Construct and test deployment and recovery hardware on-board several candidate naval vessels such as the HSV/LCS. Initiate plan for an approved manufacturing and design process so that all resultant glider systems will meet with NAVSEA approvals. Conduct sea testing of revised wings, antennas and deployment and recovery systems during Naval exercises as part of a build-test-build cycle that will lead to the optimized design. The adaptive sampling algorithms within the common control environment will be evaluated during the at sea exercises. Remaining prototypes will be constructed; anticipate delivery of six improved and hardened gliders available for use by the Navy.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Blazed Array Sonar for Ship Hull Inspection: (Navy)	0.000	0.495	0.430

The hull inspection task poses a challenging sensor problem for Naval EOD missions and for Coast Guard and Law enforcement agencies conducting Homeland Security and Anti-Terrorism missions. Low visibility conditions commonly encountered in harbor environments can limit optical imaging sensors. Alternatively, high resolution acoustic imaging offers a more reliable hull inspection imaging modality. However, classical low-grazing-angle two-dimensional sonar imaging techniques provide inconsistent results and cannot effectively search complex undership areas such as propellers and struts. The purpose of this technology transition is to demonstrate an underwater hull inspection sensor using three-dimensional acoustic imaging techniques to enable identification of complex structures found on the bottom of a ship. The TTI effort will refine the electronics and arrays from previous and current development efforts using their 3D blazed array technology. The objective is to increase the capability of the EOD-UUV effort by fielding second-generation Hull Unmanned Undersea Vehicle Localization System (HULS) capabilities 24 months earlier than currently scheduled. This technology will also limit the EOD Divers' time in the water searching the complex undership areas that the current 2D sonars are unable to image. FY 2006 Plans: Complete hardware and user interface performance specifications to guide the development of system architecture. Evaluate the architecture with a combination of computer simulation and controlled acoustic test tank analysis. Design and fabricate the alpha system. A prototype 3D sonar display software package is already in development and being tested with the 3D side looking sonar system. This software foundation will provide a strong starting point for the real time 3D forward looking sonar user interface. FY 2007 Plans: Test and refine the alpha unit to feed the beta system design. Complete the beta system design, fabrication and bench testing by August 2007. Test and refine beta system on surface vessel and ROV platform to produce a solid hardware and software system.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Flameless Ration Heater (FRH) : (Army)	0.000	0.600	0.240

The product to be transitioned is an improved, non-hydrogen producing, Flameless Ration Heater designed to eliminate current issues in packaging, handling, transportation and disposal for all Services using the Meal, Ready-to-Eat (MRE). The current FRH, developed by the Army in the 1980s, is a water activated exothermic chemical heater made from magnesium which when activated emits flammable hydrogen gas that can build to measurable levels approaching lower explosive limits when stored in large quantities and confined spaces. Additionally, there are US Environmental Protection Agency restrictions pertaining to the disposal of unreacted heaters, categorized as hazardous, and Department of Transportation guidelines regarding transportation on commercial aircraft and ships. Recent technical advances made on two alternative non-hydrogen producing heaters show considerable promise for use within the current military system. Successful completion of this TTI initiative will overcome or greatly lessen these safety, environmental, transportation, storage and readiness issues.

FY 2006 Plans: Conduct advanced engineering of nonhydrogen producing heater prototypes to improve and eliminate deficiencies in several technical areas. Based upon successful technical testing

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conducted by personnel at Natick Soldier Center (NSC), two improved alternative heaters will be procured for a FY 2006 operational field test conducted with warfighters. Improved ration heater prototypes will simultaneously undergo a battery of rough handling evaluations simulating military transport and handling as well as environmental evaluation to include high humidity and temperature extremes in Combat Feeding Directorate environmental test storage chambers. Address ramp-up and associated producibility issues with manufacturers and the ration vendor industry.

FY 2007 Plans: Develop strategies specific to manufacturing and producibility issues associated with product design, packaging, system integration, and industrial capacity to ramp up to large volume production. Conduct and complete data analysis of FY2006 evaluations. A presentation of operational field test results will be made to the Joint Services Operational Ration Forum and a decision will be rendered to adopt the item as a replacement and/or alternative to the present FRH configuration. By fourth quarter FY 2007, all procurement documentation for the alternative technology ration heaters will be developed, coordinated and transitioned to DSCP for insertion into in-place MRE contracts.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Modular Crowd Control Munition-Vehicle Mount System (MCCM-VMS): (Army)	0.000	0.805	0.000

The MCCM VMS is a combination of electronic controls, junction boxes, igniters, and mounting brackets that allows Soldiers or Marines to mount and fire the M5, MCCM from a variety of vehicles including the HMMWV, cargo trucks or other tactical vehicles. The first generation of MCCM-VMS allowed for control of up to four MCCMs with a hard wired switch activated control box. This second generation, or Gen2, will use a digital controller and a modular design, potentially with a Personal Digital Assistant (PDA) or Toughbook interface, to allow control of up to 24 individually fired MCCMs. It will be field adaptable to specific vehicles and there is also potential application to ground emplaced units for check point, crossroads or perimeter defense of bases or installations. The TTI effort would accelerate technology/product transition by at least three years. FY 2006 Plans: Complete software development; complete junction and master control box development; complete test hardware sets fabrication; conduct safety/performance testing, and conduct urgent material release for OIF. Complete training package; conduct initial fielding and operational standup (vehicle type/qty to be determined). Transition to occur early in FYDP.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Shipboard Composite Combat Identification (SCCID): (Navy)	0.000	0.600	0.970

The Navy, through the joint support and efforts of PMA-290 and the Office of Naval Research (ONR), has developed a multi-source fusion and Combat Identification (CID) engine called STORY MAKER for the EP-3E Intelligence Surveillance and Reconnaissance (ISR) aircraft. SCCID is presently a RDT&E effort being supported by ONR Knowledge Superiority and Awareness (KSA) Future Navy Capabilities (FNC) and PEO C4I and Space, PMW 180. The purpose of the SCCID TTI effort is to adapt STORY MAKER's CID capabilities to provide Ship's Signal Exploitation Space (SSES) equipped ships with a multi-source fusion capability and a CID engine that can process both GENSER and Sensitive Compartmented Information (SCI) evidence to derive CID for Link-16 and CEC-based radar tracks. SCCID will provide the warfighter with rapid recommendations based on the fusing and correlation of organic and national SIGINT data. This will improve battlespace awareness and provide a means that will help prevent fratricide, engagement on friendly or neutral tracks, and reduce the operator manual efforts in analyzing the numerous track data inputs. This proposed TTI project would accelerate technology/product transition by 18 months.

FY 2006 Plans: Integration and testing of SCCID at the Systems Integration Laboratory (SIL) located at Space and Naval Warfare Systems Center (SPAWAR SYSCEN), San Diego (SSC SD) in FY 2006. Activities to include: Radiant Mercury template development for a two way communications interface between CEC and SCCID; SCCID Open Architecture Computer Environment (OACE) and Net Centric Enterprise Solution for Interoperability (NESI) compliance; SCCID Defense Information Infrastructure (DII) Common Operating Environment (COE) compliance; SCCID Segmentation into CUB; SCCID and CEC Integration software development and test; MOA SIL Tests; Coherent scenario development.

FY 2007 Plans: SCCID software will be installed on an at sea demonstration unit for tests upon completion of the MOA SIL tests. Expectation is SCCID be a system participating in Trident Warrior 07. Crew training will occur prior to installation of the SCCID prototype either at SSC SD or onboard the at sea demonstration candidate. Post at sea demonstration report will be written and distributed to the

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appropriate commands.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Joint Land/Littoral Battle Command Warfighter Interface: (Army)	0.000	0.960	2.200

The Command Post of the Future (CPoF) is a high priority, DARPA-sponsored technology program that provides a software suite of collaboration tools accessed through a superior intuitive human-computer interface (HCI), which is rapidly becoming the defacto executive decision support system from Corps down through Battalion. The current CPoF system consists of both clients and servers. In the near/mid-term OIF rotations, CPoF will be fielded side-by-side with the Army's Acquisition Category (ACAT) I Maneuver Control System (MCS) and Marine Corps' Command and Control PC (C2PC). Current Army and Marine Corps ACAT systems have a significant initial and follow-on training requirement burden. This TTI project will significantly reduce this burden by transitioning CPOF, which has been proven to be intuitive, easier to use, and requiring significantly less initial and follow-on training, into the Joint Tactical Common Operating Picture (COP) Workstation (JTCW). JTCW is mandated by the Joint Requirements Oversight Council (JROC) as the near/mid-term tactical level single common C2 platform for land/littoral operations. JTCW represents the merger of numerous Army battle command functional area software applications onto the Marine Corps' C2PC baseline. This TTI project would accelerate the transition and application of CPOF-based HCI technology into the unified Army-Marine Corps JTCW system by approximately 18 months.
FY 2006 Plans: Conduct comprehensive usability engineering and human computer interface assessments on the latest versions of the Command Post of the Future (CPOF) system and Joint Tactical Common Operating Picture (COP) Workstation (JTCW) client. Initiate and examine the current interface between application software and human-computer interface (HCI) for the JTCW client.
FY 2007 Plans: Develop an initial core set of application program interfaces (APIs) between JTCW's Battle Command services and a single intuitive easy-to-use CPOF-based client presentation layer. Define and document a HCI design guidance package for this CPOF-based client presentation layer. Develop a corresponding client presentation layer that will serve as a guiding common interface template for other client application HCIs.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Sense and Avoid (SAA) for Small UAVs (SUAV): (Air Force)	0.000	1.130	0.630

Sense and Avoid (SAA) for Small UAVs (SUAV) (Air Force): UAVs operating in National Air Space (NAS) or foreign civil airspace must obtain special authorization and/or use either chase planes or ground-based observers. This process is cumbersome, expensive, and limits the effectiveness of DoD UAVs. Additionally, UAVs must operate in tactical environments during war alongside other DoD/friendly aircraft (helicopters, fighters, bombers, etc.). This type of high-density environment requires a capability to avoid possible collisions, one that must meet Federal Aviation Administration (FAA) regulations. The capability must be effective against all air traffic, with or without active, transponder-based collision avoidance systems. The technology to be transitioned is called Sense and Avoid for Small UAVs (Small-SAA). Small-SAA is a system composed of low cost optical sensors, processors, and proprietary software. The system is being developed for use by DoD UAVs to visually detect other aircraft in the vicinity and identify possible collisions. The product to transition for UAVs will be the hardware and software necessary to alert the ground-based pilot and/or an on-board avoidance maneuvering subsystem of any potential collision courses. Small-SAA is based on modifying/miniaturizing existing SAA technology developed by AFRL for large and mid-sized UAVs (i.e., Global Hawk and Predator) to support much smaller tactical UAVs such as Scan Eagle and Raven UAVs. TTI funding will accelerate the transition of Small-SAA by a minimum of two years
FY 2006 Plans: Select UAS platforms to be covered by this initiative (such as Shadow) and define Small-SAA system performance requirements; Design Small-SAA system architecture; Procure long-lead hardware components and subsystems. Adapt SAA software for small UAS implementation. Begin prototype Small-SAA system fabrication.
FY 2007 Plans: Complete prototype Small-SAA system fabrication; Conduct laboratory and UAS surrogate testing; Plan and conduct Small-SAA flight demonstration on Aerostar UAS.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Log Based Planning for OIF Authority Transition: (Army)	0.000	0.960	0.790

This program addresses a new requirement for logistics units resulting from OIF and the transition of authority to the Iraqi Security Forces. In order to facilitate the transition of power from US military forces

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to Iraqi forces, a number of log bases will be established. Both US and Iraq forces will receive support from these bases, creating a log base planning requirement for existing Command and Control (C2) systems. The Army's Joint Tactical COP Workstation (JTCW) is currently the joint ground C2 system for tactical and operational planning but no log base planning capability exists. In the past, the Logistics C2 Science and Technology Objective (STO) created models and reasoning capabilities to accommodate tactical and operational combat service support plans. These capabilities must be extended and transitioned to JTCW to permit the creation and maintenance of log bases in which multi-national forces will conduct transition of power training. This TTI effort will result in a log base planning capability in JTCW release 7.0. The acceleration realized in the transition plan is greater than two years.

FY 2006 Plans: Design Architecture for multi-national logistics resupply support to address the following logistics class categories: Class I (Food/Water); Class 3 (Fuel); Class 4 (Construction materials); Class 5 (Ammunition); Class 7 (End Items); Class 8 (Medical); Class 9 (Maintenance Parts). Development of consumption models for logistics class categories.

FY 2007 Plans: Development of re-supply models for Support and Service requirements; Delivery mechanism allocation; Delivery scheduler; Delivery resource loader; and Inventory manager. Final test and JTCW Integration

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Transition of Semantic Web Network to Additional Commands: (NGA)	0.000	0.720	0.630

Semantic Web Networking is an XML-based content routing system that enhances Command and Control by delivering more relevant and complete information from across Intel Community databases in real-time. Several components comprise this product, including the core content routing algorithms (available as software only, but typically deployed on COTS servers); database adaptors for new data sources; and, either a web-based or application-based user client. Developed through the National Technology Alliance (NTA), this technology matured faster than expected and has now been transitioned to the Marine Corp System Command (MARCORSYSCOM), Marine Expeditionary Force-Intelligence Analysis System (MEF-IAS), enabled by two years of support from the OSD/TTI program. Based on the success of the Marine Corps with this technology, it is now being evaluated for additional transition to US Army and Special Forces. This follow-on TTI effort will support evaluation of the "MarineLink" Semantic Web Network as part of an experimental cell at Ft. Bragg, with eventual transition paths to the SOJICC for SOCOM, and to US Army operational units in theater.

FY 2006 Plans: Leverage previous semantic routing development to provide needed capability at Predictive Analysis cell (Ft. Bragg). Specific tasks include the coordination of USASOC tactical user requirements and understanding of the relevant information model/ontology; implementation of appropriate semantic routing hardware and software at the Predictive Analysis cell; development of additional database adaptors to support USASOC operational needs; and integration with Asymmetrical Software Kit and NEXIS tools.

FY 2007 Plans: Evolve semantic routing implementation at Ft. Bragg towards insertion paths at SOCOM and US Army operational units in theater. Specific tasks include the coordination of SOCOM-wide operational user requirements and understanding of the relevant information model/ontology; implementation of appropriate semantic routing hardware and software at SOJICC (Tampa); development of additional database adaptors to support SOCOM operational needs; and integration with current and future predictive and analytic tools.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Advanced Digital Multi-Spectral Night Vision Goggles: (SOCOM)	0.000	2.090	2.835

The product to be transitioned is a new night vision goggle. This goggle will utilize digital technology to generate an image composed from multiple cameras providing a scene composed of multiple wave bands. The imagery generated from the goggle sensor modules will be digitally fused and presented to the soldier via a high-resolution display. The goggle will also allow the soldier to share this imagery via available video communication links. The goggle will also have the capability to display video from external sources to the soldier, e.g. from the soldier's thermal weapon sight. The Advanced Digital Multi-spectral Night Vision Goggle (ADM NVG) will continue to utilize the existing mounting hardware currently used by the soldier. The goggle will predominantly be worn on the soldier's helmet, but the utilization of a facemask will remain an option. The system will consist of two modules; the first module, the goggle, is composed of the sensors, the displays, the image processor, and controls, the second

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module is the battery pack, which will house two separate battery modules for operation of the device. The system will also be operational utilizing existing fielded power sources. This will be done to allow the soldier to operate the ADM NVG via vehicle power, via other larger batteries for extended periods of operation, and will allow the soldier to scavenge for power.

FY 2006 Plans: Continue development efforts to reduce overall system weight and power draw through advancements in the near infrared (NIR) and short wave infrared (SWIR) camera and custom Hardened Field Programmable Gate Array (FPGA). The Hardened FPGA will provide a refined circuit design to be implemented through the use of an Application-Specific Integrated Circuit (ASIC). The NIR camera advancements are targeting a solid state camera that will both reduce the size and weight of the camera device while providing a camera that matches the performance of the current image tube technology found in fielded night vision goggles. The SWIR camera development will target a high resolution, high sensitivity SWIR camera able to maintain performance through the full range of environmental conditions. The development of a custom ASIC will replace the current power hungry frame gate array technology. The design and development of an ASIC usually takes 18 to 36 months but will provide significant improvements in power draw and size.

FY 2007 Plans: Complete the NIR & SWIR camera development effort and continue development efforts of an ASIC.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
High Capacity Information Connectivity for Aerospace Platforms: (HICAP): (Air Force)	0.000	3.600	2.200

The Services are migrating to airborne network centric operations and are adding new high data output sensors and multi-sensor operations into the airborne DoD inventory. This new airborne architecture presents a unique challenge for airborne communications and requires a significant increase in throughput of airborne (air-to-air and air-to-surface) communications. The DoD Common Data Link (CDL) Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) program is the planned communications backbone supporting future network centric operations and requires new technology to provide an increase in data rates and bandwidth. HICAP provides the technology and designs required to meet this communications challenge. The products to transition are HICAP hardware and software/designs to the ongoing DoD CDL program. This transition is unique as it focuses on developing high data rate technologies for transition into the ongoing CDL program vice developing a new stand-alone system. HICAP provides technology capable of doubling and quadrupling current airborne CDL return data rates from 274 Mbps (1X) to 548 Mbps (2X) and 1.1 Gbps (4X). HICAP has developed and demonstrated the 2X and 4X rates in a lab environment. The 2X capability is expected to require only card-level changes to CDL equipment while the 4X option will leverage the 2X card change and add a card-level change plus airborne antenna upgrade kit. HICAP, therefore, transitions two technologies: (1) 2X A-CDL waveform; and (2) 4X capability by transmitting two parallel 548 waveforms with orthogonal polarizations.

The higher data rates will be used to support new high-output and multi-output Intelligence, Surveillance, and Reconnaissance (ISR) sensors and the all-weather interface to the future laser-communications architecture.

FY 2006 Plans: Complete Design and Integrate 2X waveform into Hardware, Design of Adaptive Cross Polarization Canceller and Dual Polarization Antenna for 4X CDL. FY 2007 Plans: Build and Integrate 4X CDL capability into hardware and antenna; Demonstrate 2X Capability; Demonstrate 4X capability.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
FY 2007 Program Plans:	0.000	0.000	8.618

The TTI Program Proposal process begins in January 2006 with the release of the data call for FY 2007 new start nominations. The remaining FY 2007 program funds in the amount of $8.618 million will support the initiation of the new start projects selected. These selections will be made in the third quarter FY 2006.

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C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.