OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
	Total Program Element (PE) Cost	103.566	113.244	113.924	114.565	108.421	109.865	111.413
P826	Quick Reaction Fund	26.322	34.173	31.981	31.758	29.981	30.380	30.808
P828	Rapid Reaction Fund	50.537	50.073	50.960	51.046	48.461	49.107	49.799
P829	Technology Transition Initiative (TTI)	26.707	28.998	30.983	31.761	29.979	30.378	30.806
P830	UAV							

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 receives high congressional interest.

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.

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 successfully demonstrate new technologies in relevant environments and accelerate the introduction of new technologies into operational capabilities for the armed forces.

RRF is fully executed through the Combating Terrorism Technology Task Force (CTTTF), recently re-designated, as the Rapid Reaction Technology Office (RRTO). The CTTTF was stood up to provide rapid response to operations in Iraq and other theaters in support of the Global War on Terrorism (GWOT) and to accelerate the transition of high-potential science and technology projects into operationally useful products in the execution years.

In FY 2008, CTTTF/RRTO's objectives are to leverage the DoD science and technology base and those of the other Federal Departments; stimulate interagency coordination and cooperation; accelerate the fielding of capabilities and concepts to counter emerging threats; and provide feedback to the S&T community to guide long term developmental strategies. 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 adversary's application of available and advanced technology. The average length of a CTTTF program falls within an 8-12 month range in order to more effectively aid the warfighter.

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February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	108.159	109.514	114.145
Current BES/President's Budget (FY 2009)	103.566	113.244	113.924
Total Adjustments	-4.593	3.730	-0.221
Congressional Program Reductions		-0.990	
Congressional Rescissions			
Congressional Increases		4.720	
Reprogrammings			
SBIR/STTR Transfer	-3.028		
Other	-1.565		-0.221

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

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						
08						

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

TTI: In FY 2007, initiated the new start of 12 projects and conclude the activities on many continuing projects with the result of at least 13 technologies transitioning to the warfighter.

In FY 2008, initiate the new start of 12 projects and conclude the activities on many continuing projects with the result of at least 12 technologies transitioning to the warfighter.

In FY 2009, initiate the new start of projects and conclude the activities on many continuing projects with the results of several of the technologies transitioning to the warfighter.

RRF: In FY 2006/FY 2007/FY 2008, RRF investment decisions are made during the execution years in response to combatant commander requirements and new threats/new opportunities.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P826**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P826 Quick Reaction Fund	26.322	34.173	31.981	31.758	29.981	30.380	30.808

A. Mission Description and Budget Item 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 October 17, 2006 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 that have the potential to address disruptive, catastrophic and irregular technologies. 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 2007 funding include Advanced Orbit Determination for Tagging, Tracking and Locating Satellite Interference on Critical Military Communication Links, Backward Wave Oscillator, Deployable Satellite Communication System, Microclimate Cooling System for Warfighters, 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 2008 and 2009 plans are to continue to respond to critical operational needs and technology opportunities.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Advanced Gaseous Electrostatic Energy (AGEE)	1.800		

FY 2007 Accomplishments: The primary objective of this initiative is to revalidate and prove the effectiveness of inertial electrostatic confinement using the polyhedral magnetic field systems studied over the previous 19 years of R&D. The final success of the last tests in CY2005 will be reproduced and results validated by experiments on two more machines to prove that the entire concept, applicable to boron/hydrogen reactions, can and does work and can be developed for employment in DoD power systems at an early date.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Advanced Orbit Determination for Tagging, Tracking and Locating Satellite Interference on Critical Military Communication Links	0.600		

FY 2007 Accomplishments: Currently, Communication and Network Operations & Security Center (NOSC) personnel focus on unique mission aspects of ensuring that communication systems used by the DoD are protected from attack and exploitation. This effort will provide tools that can be used to present a full situational awareness of interference to operational DoD communications and networks. The developed tools will present an ability to accurately determine the location of adversarial interference on DoD communication links and allow for corrective actions to be implemented.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Backward Wave Oscillator	0.052		

FY 2007 Accomplishments: The objective is to perform further tests and analysis to determine issues preventing successful operation of a 600-700 GHz backward wave oscillator (BWO). Once the causes of the problem are determined, the BWO will be modified and retested. Successful development of the BWO will provide a THz RF source for molecular spectroscopy. These applications include high resolution imaging, detection of biological and chemical agents and explosives, and secure communications. This program, if successfully completed, will provide a RF source that significantly exceeds the capabilities of current sources.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Deployable Satellite Communication System	1.877		

FY 2007 Accomplishments: This project will evaluate the field utility and interoperability with current systems of a unique inflatable satellite antenna solution which packages in a single man-portable hardened case, and yet inflates to provide a two-meter class reflector as a stand-alone solution or to augment current small-aperture terminals and provide back-up capability in case a primary system is damaged. This antenna can reduce the logistical footprint in volume of deployable antennas by a factor of 30:1 and decrease the weight of such system by an order of magnitude. The ability to package the antennas in such small volumes enables the user to deploy a larger antenna aperture thereby reducing the satellite transponder power on-orbit and transmit power at the operation sites. These systems offer great advantages for deployed troops that require high bandwidth satellite communication in remote environments where access to delivery by trucks is limited or non-existent.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Encapsulated Perfluorocarbon Tracer Tag, Track, and Location System	0.927		

FY 2007 Accomplishments: This initiative will develop of a covert tag, track and locate (TTL) identification system using encapsulated Perfluorocarbon tracer (PFT) materials and optical long range detection. PFTs are safe, volatile, non-reactive, environmentally benign compounds. By concentrating and extending the detectable life of the PFT tag materials and incorporating these materials into operation specific forms, this program will provide a unique tagging, tracking and identification system.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Forensics Signature Sensor	0.900		

FY 2007 Accomplishments: The objective of the Forensics Signature Sensor is to provide a real-time gathering tool to assist in the analysis of energy spectrum of combustion sources. The Microlens sensor uses the signature to provide information relating to the type and location of the materials and procedures used. This enhanced capability will aid in identifying common traits of the energy spectrum of the combustion materials, providing forensics information necessary to identify the material and the environment prior to the event.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Hardened Facility Attack Camera	0.170		

FY 2007 Accomplishments: This project will design, build, and demonstrate a camera to image the interiors of hardened and deeply buried targets (HDBT). The camera would be mounted on penetrating bombs and weapons to provide an image of the interior of the structure or facility just prior to detonation of the warhead. The camera would transmit imagery through the bomb's own penetration hole to relay receivers on the attack aircraft or loitering UAVs deployed in the vicinity of the attack. This imagery would add invaluable information about target interiors for verification and re-attack planning. This is a FY06 project funded with split FY06/FY07 funds.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

Kaleidoscope Development and Technical Management	1.500		

FY 2007 Accomplishments: The joint C2ISR and UAV Battlelab KALEIDOSCOPE initiative is an algorithm-based stand-off capability for tagging, tracking and locating moving ground targets, primarily through the automated, real-time analysis of UAV video. KALEIDOSCOPE's main goal is to locate, track, and disseminate moving targets via machine-to-machine (M2M) means to expedite TST tracking and targeting. Additionally, the capability enables the automated fusion of video to other multi-INT sources, using the same concept that permits video to be indexed and subsequently searched for video segments that correspond to described behaviors (i.e. specific vehicle move-stop-move behaviors).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Long-Endurance RF Tags	1.019		

FY 2007 Accomplishments: The objective is the development of an innovative tracking and locating RF tag that significantly extends battery life time, achieves low RF signature (only emits when probed by reader) and maintains small form factor for covert operation. This tag will have a business card form factor with an expected lifetime of 3-4 months (thin-film battery), or a _Quarter-sized_ form factor that has a lifetime of 4 years (watch battery).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
M1A1 External Auxiliary Power Unit	0.815		

FY 2007 Accomplishments: This effort will replace the existing External Auxiliary Power Unit (EAPU) on the USMC M1A1 Main Battle Tank with a quieter, more reliable, and more powerful EAPU. The M1A1 currently has an EAPU that is extremely noisy, unreliable, and lacking in power generation. Under this effort a prototype EAPU will be assembled that significantly reduces the noise emissions, increases the reliability, provides more power generation, and stays within the form/fit/function of the existing EAPU. This program will enable the tank crew to use the EAPU as intended and improve the M1A1 reliability, availability, and decrease its fuel consumption.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
M1A1 Main Battle Tank Rear Sensor	0.850		

FY 2007 Accomplishments: This effort will integrate a rear thermal sensor onto USMC M1A1 Main Battle Tank. The M1A1 currently has no rear sensor. This program will increase the tank crews_ situational awareness and minimize casualties. The M1A1 rear sensor program will also greatly aid the tank crew in following battlefield conditions under adverse weather, obscurants, and night operations.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Microclimate Cooling System for Warfighters	0.845		

FY 2007 Accomplishments: The use of microclimate cooling systems/technology has been shown to mitigate the effects of heat stress on Warfighters operating in hot environments while wearing body armor. This project will leverage prior and on-going S&T work in the development of a vapor compression microclimate cooling system. The system will consist of a small refrigeration device weighing approximately 8 pounds. The device chills and pumps a fluid through a tube-lined microclimate cooling garment, worn against the skin, where body heat is exchanged with the circulating fluid, providing a cooling effect. The use of microclimate cooling has been shown to reduce body core temperature rise, improve thermal comfort, and significantly increase mission duration in the heat.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

MRAP Wiki	0.091		

FY 2007 Accomplishments: The objective of this task is to provide technical, financial, and management support in the execution of Director, Defense Research and Engineering (DDR&E) programs to include Counterterrorism Technology Task Force (CTTTF), Quick Reaction Fund (QRF), and Mine Resistant Ambush Protected (MRAP) Wiki projects.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Multi-Aperture Sparse Imager Video System (MASIVS)	1.500		

FY 2007 Accomplishments: The objective of this project is to build an end-to-end MASIVS imaging system that utilizes mosaics of CMOS devices. The MASIVS imaging system developed under this effort is intended to be the imaging subsystem of a fieldable wide area persistent surveillance system. This is a $3M project jointly funded between QRF and RRF.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Night Stare Program	1.640		

FY 2007 Accomplishments: This program will develop, test, and demonstrate an Infrared (day/night) wide area persistent surveillance system with sufficient resolution and update rate to track enemy combatants to support targeting decisions. This will provide wide area persistent surveillance consistent with Angel Fire with added day/night capability, high resolution imagery to facilitate high fidelity dismount tracking in urban environment, rapid updates to establish and accurately maintain tracks of targets, and real time monitoring and reaction Forensic backtracking of events.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Portable Airborne Interrogator Transponder System Antenna Suite	1.325		

FY 2007 Accomplishments: The current size and weight of the PAITS antenna suite restrict the air platform it can be employed on for current operations. This program will develop an antenna solution which will enhance the overall portability of the system and provide an enhanced antenna suite for PAITS to provide worldwide tracking of subminiature radar like responsive tags. The development of a suite of antennas, including one that is operational inside an aircraft, would add to the types of aircraft available for use with PAITS.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Photographic Landing Augmentation System for Helicopters (PhLASH)	1.750		

FY 2007 Accomplishments: The PhLASH system provides a high degree of situational awareness to the helicopter crew during obscured landings. This capability reduces spatial disorientation that can occur in brownout conditions and provide awareness of obstacles in the LZ, enabling the aircraft to land safely. This effort will develop a ruggedized, certified hardware representation of the developmental PhLASH system. PhLASH will mitigate the risks to aircrews and aircraft that result from rotary-wing operations in arid, dusty conditions by increasing the situational awareness of crews engulfed in dust while attempting to land.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Reality Mobile	1.450		

FY 2007 Accomplishments: The objective of this effort is to provide enhancements to the RealityVision software. The details of this project are classified.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

Single Card Solution (SCS)-based National Tactical Receiver (SNTR) Module	0.085		

FY 2007 Accomplishments: The SCS is a fully software-defined radio and can be programmed to generate the waveforms and crypto needed to receive the Integrated Broadcast System (IBS), which provides timely tactical intelligence information to warfighters. Legacy IBS receivers are not suitable for use by individuals. This project will permit completion of a Software Development Unit (SDU) for the SCS to allow proof of concept for the SNTR, and accelerate availability by a year. This will make receipt of the IBS by the individual in the battlespace practical, with major implications for mission effectiveness, fratricide prevention, and personnel recovery. This is a FY06 project funded with split FY06/FY07 funds.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Standoff Terahertz Human Threat Identification	2.115		

FY 2007 Accomplishments: The goal of this effort is the development of a THz Ladar sensor capable of detecting trace explosives on human hair, clothing, packaging and other personal effects at standoff ranges of greater than 50 meters. This sensor system would be applicable to checkpoint screening, force protection in foreign military installations, protection of consular offices and other American facilities abroad, and protection of airports and other ports of entry.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Transnational Information Sharing - Coalition (TISC) Limited Objective Experiment (LOE)	0.700		

FY 2007 Accomplishments: The experiment objective is to demonstrate a collaborative information environment highlighting the use of an unclassified situational awareness capability. The unclassified situational awareness capability will show both a land view and a maritime view taking advantage of the EUCOM sponsored Regional Maritime Awareness Capability (RMAC) Joint Capability Technology Demonstration (JCTD). This experiment will be shown in three different locations in Africa.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Transportable Network Centric Communication Equipment WDLA	2.500		

FY 2007 Accomplishments: WDLA will be self contained rugged transportable system that allows for easy integration onto multiple Tactical Air Control (TACP) vehicular systems. This system will allow for maximum utilization of USAF TACP Modernization hardware and software systems presently deployed for use in digital Close Air Support (CAS) operations. The system's hardware and software will provide the warfighter with an affordable Link-16 system outside of the traditional Link-16 systems (MIDS LVT) being fielded on major weapon system platforms today that meets the size, weight, power, and cost constraints of the USAF TACPs for Tactics, Techniques, and Procedures (TTP) development with a transition path to fielding. WDLA uses the Weapons Data Link waveform developed for enhanced communication between the shooter and the weapon.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
University of Alaska Unmanned Aircraft Systems Experimentation, Test, and Evaluation	1.000		

FY 2007 Accomplishments: This effort will test and evaluate unmanned aerial system (UAS) operations in northern latitudes and harsh environments. This testing and evaluation shall include scientific, homeland security and DOD missions. This project is funded via a congressional add.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Vehicle Power and Energy Coating Technology Demonstration	0.139		

FY 2007 Accomplishments: This effort will apply and test a Nickel Boron coating to ring and pinion gears and demonstrate the wear resistance required to enable lower viscosity oils to be used in

vehicle systems.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
WiFi Radar	0.764		

FY 2007 Accomplishments: The objective of this effort is to develop a prototype 802.11b/g wireless-client locator that is capable of isolating a target client in three-dimensional space with sufficient accuracy to support actionable intervention. This capability will be developed as a hand-held and vehicle mountable system. Additionally, this capability will be developed to specifically locate clients storing material previously _marked_ with a beacon of our choice.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Other	-0.092		

FY 2007 Accomplishments: The details of this project are classified.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Program Support			

FY 2007 Accomplishments: Provide management and analysis of highly specialized defense research and engineering technologies. Support includes technical, financial, administrative, and programmatic analysis of current and planned projects for QRF.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Program Taxes			

Mandated taxes for SBIR, STTR, FFRDC, etc.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008 and FY 2009 Plans:		34.173	31.981

The FY 2008 QRF Proposals have been received and a review panel has been designated to review and recommend proposals for funding. Selected proposals will be reported in the following QRSP Congressional Report. The FY 2009 data call for new start projects will be fielded in the fourth quarter of FY 2008.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P828**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P828 Rapid Reaction Fund	50.537	50.073	50.960	51.046	48.461	49.107	49.799

A. Mission Description and Budget Item Justification: The Quick Reaction Special Projects Program(QRSP) (Program Element 0603826D8Z) supports three separate projects that provide rapid funding to expedite the 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 (RRF). The Defense Acquisition Challenge Program (DACP), formerly part of QRSP, was transferred in FY 2005 and out years to PE0604051D8Z.

RRF is fully executed through the Combating Terrorism Technology Task Force (CTTTF), recently re-designated as the Rapid Reaction Technology Office (RRTO). The CTTTF was stood up to provide rapid response to operations in Iraq, Afghanistan and other theaters in support of the Global War on Terrorism (GWOT) and to accelerate the transition of high-potential science and technology projects into operationally useful products in the execution years. In FY 2005/2006, CTTTF/RRTO leveraged the DoD science and technology base and those of the other Federal Departments; stimulated interagency coordination and cooperation; accelerated the fielding of capabilities and concepts to counter emerging threats; and provided feedback to the S&T community to guide long term developmental strategies. The task force anticipated adversaries' exploitation of technology, including available and advanced capabilities. Additionally, the task force exploited technology developed outside of DoD in the commercial sector, in academia and internationally; as well as anticipated adversary's application of available and advanced technology. In FY 2007 RRTO built upon previous experience and pursued projects in: counter cover, concealment and deception in a counter insurgency environment; explored methods and approaches of persistent surveillance stimulation for counterinsurgency; developed alternate power sources for sensors and systems; and expanded human, social and cultural knowledge. In FY 2008 RRTO will focus its projects in the areas of small unit situation awareness, program synchronization, non-kinetic operations, strategic communications, biometrics and forensic applications, persistent surveillance infrastructure, maritime surveillance, small unit dispersed capabilities within specific geographic areas, cross organization/agency sharing , network war concept development and strategic multi-layer assessments. The average length of a CTTTF/RRTO project falls within an 8-12 month range in order to more effectively aid the warfighter.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Alternative Approaches & Platforms for Logistics and Operational Influence	0.175		
FY 2007 Accomplishments: The ability to utilize non-governmental organizations and third party logistics providers to provide commercial, logistic and social services in overseas areas of interest in support of the global war on terrorism.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Automated Credibility Assessment Training Simulation (ACATS)	0.900		
FY 2007 Accomplishments: The development, testing and transition of the computer-based training simulation to support the acquisition and sustainment of the requisite skills underlying credibility assessment. The payoff from ACATS is the increased ability of US personnel to assess credibility in real-time across their operational mission space to include access control points, interrogations,			

sweeps, etc.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Detection of Hidden Objects using Acoustic Imaging	0.250		

FY 2007 Accomplishments: This project evaluated the use of acoustic imaging for the detection of hidden objects and concealed structures, including, but not limited to IED (Improvised Explosive Devices). The acoustic imaging technique uses an acoustic excitation device and an acoustic camera.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Project AGIG	0.975		

FY 2007 Accomplishments: This project fields a ruggedized operational wireless high data rate Internet Protocol (IP)-based network for tactical edge users including small/medium sized Unmanned Aerial System(UAS), vehicles/dismounted soldiers, and unattended sensors with reach-back to infrastructure.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Biometrics Strategy Framework	0.667		

FY 2007 Accomplishments: Identify, quantify and develop a sustainable enterprise biometrics framework, investment strategy, business case and metrics.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Biometric Information Technology Evaluation	0.300		

FY 2007 Accomplishments: Comprehensive collection of available information on the deployed biometric systems, how they are currently used, how different employment concepts alter performance and development of a process oriented flow diagram of these individual deployments as an overall system. This constitutes a current baseline that can be used for systems analysis, gap analysis and prioritization of future investments.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Blue Team Assessments	1.000		

FY 2007 Accomplishments: This effort has conducted independent assessments of proposed force protection capabilities and concepts on an as tasked basis.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
GMTI/EO Vehicle Tracking Handover: Project Bluegrass	3.925		

This effort has gathered data to develop algorithms for and quantify the performance of handover of vehicle tracks between a Ground Moving Target Indicator (GMTI) radar and a passive Electro-Optical (EO) video sensor.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

Producibility and Transition Study	0.070		

FY 2007 Accomplishments: The Rapid Reaction Technology Office (RRTO) supports the development of a variety of technologies of potentially critical value to U.S. forces. Many of these technologies are under development by research and development organizations with little expertise in production for field use. The objective of the work is twofold: 1) provide transition planning for those technologies with identified transition paths and 2) support the identification and qualification of potential acquirers for those technologies that have not developed a transition path.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Counter Insurgency Pattern Assessment (CIPA) - Project Potomac	2.000		

FY 2007 Accomplishments: The CIPA program has developed a technology to identify geo-spatial and behavioral patterns associated with insurgent actions. To date the program has worked with compartmentalized data. The goal of this project was to explore the utility of this approach using open source intelligence with the goal of improving the situation understanding of the warfighter.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Application of Law Enforcement System for Human Terrain Mapping and Counter Insurgency	0.100		

FY 2007 Accomplishments: This project assessed the ability of communication architecture with a layered data base to produce actionable intelligence during Marine Corps vehicle checkpoint operations at Camp Roberts test center and Camp Dawson.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Common Operation Research Environment (CORE) Program	0.637		

FY 2007 Accomplishments: This project leveraged analytical technologies to educate the officer corps on how to apply theoretical concepts to the problems of terrorism and irregular warfare.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Enhanced Exploitation of Wide-Area Persistent Surveillance Data	0.672		

FY 2007 Accomplishments: This project applied mature technology to an existing problem in the realm of exploiting massive amounts of wide-area surveillance data.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Exploration of Commercially Innovative Technologies for Terrorist (and counter) Exploitation (EXCITTE)	0.250		

FY 2007 Accomplishments: This project's goal was to proactively seek, identify, assess, exploit and/or counter, rapidly emerging commercial technological capabilities that could be employed by friendly or enemy forces in the Global War on Terror.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Extreme Medallion - Advanced Forecasting and Correlation for Network Component Identification	0.400		

FY 2007 Accomplishments: Demonstrated an innovative approach to combine recent successes in forecasting and network mapping with the advanced functional sequencing of the adversary's business practices to help map a specific critical network function of interest.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
3D Enhanced Face Recognition	0.450		
FY 2007 Accomplishments: This effort provides analysts a state-of-the-art 3D enhanced face recognition system to be used operationally for the processing of face image data.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
OSD/SCO Facilities and Core support	0.356		
FY 2007 Accomplishments: Provided technical, administrative, and security support as well as other direct costs (ODC) associated with the Office of the Secretary of Defense (OSD) Sensitive Compartmented Information Facility (SCIF) facility in Crystal City, Virginia.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Identification of Border/Perimeter Incursions and Vehicle-Stopping Events using In-Ground Fiber-Optic Sensors	0.500		
FY2007 Accomplishments: This project worked to develop detection, classification, and tracking (DCT) algorithms to identify seismic disturbances from tactically relevant events. The DCT algorithms are used in conjunction with in-ground fiber-optic (FO) sensors for events related to border/perimeter incursions and vehicles stopping along a sensor route.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Alternative Power for Small Platforms and Devices: Phase II	0.600		
FY 2007 Accomplishments: Phase II efforts are to fully automate the operation of the fuel cell propulsion system and the overall operation of an unmanned aerial system (UAS).			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Geospatial-Intelligence Software Assessment and Prototyping (GSAP) II	1.000		
FY 2007 Accomplishments: This project is for the assessment and prototyping of new and emerging technologies in the area of on-demand geospatial intelligence (GEOINT) technologies. The software being evaluated currently provides on-demand assimilation of multiple, spatially disparate sensor data for critical analytic usage.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Halo Falcon II	0.775		
FY 2007 Accomplishments: HALO Falcon II is a joint Office of the Secretary of Defense/Special Capabilities Office (OSD/SCO), Central Command (CENTCOM) and the United States Geological Survey (USGS) sponsored test designed to collect hyperspectral data of Afghanistan. Additionally, the mission provided an engineering evaluation of a suite of technologically advanced sensors.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Halo Sol	0.700		
FY 2007 Accomplishments: HALO Sol consisted of high altitude (~60 kft) data collection operations on the NASA operated WB-57 aircraft in the Southern Command (SOUTHCOM) Area pf Responsibility (AOR). The test included both controlled and ad hoc target sites.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Technology Initiatives for Improving Non-Kinetic Capabilities for Irregular Warfare	0.300		
FY 2007 Accomplishments: To identify directions for technology initiatives that could significantly improve _non-kinetic_ capabilities for irregular warfare.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Remotely Interrogated Infrared Polymer Emitters for Individual Identify Friend or Foe (IIFF)	0.100		
FY 2007 Accomplishments: The program builds upon a successful collaboration to develop lightweight, low cost patches for individual IIFF, using the Polymer light-emitting diode (PLED) technology and remote activation via modulation of U.S. targeting lasers.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Integrated System Fusion (ISF)	0.775		
FY 2007 Accomplishments: ISF is an effort to integrate three products; an Electro-Optical/InfraRed (EO/IR) camera, commercial satellite modem, and synthetic video software. The information is transmitted and then distributed across land lines to at least two nodes for sharing of information and possible on-line collaboration.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Analysis of Science & Technology (S&T) Alignment with Joint Urgent Operational Needs (JUONS)	0.108		
FY 2007 Accomplishments: This project is a survey of all JUONs received from Combatant Commanders. The survey identifies and catalogs all key technology elements that are germane to the operational need and will afford a disciplined approach to fulfilling the needs.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
L-Tag	0.650		
FY 2007 Accomplishments: L-Tag is an effort to develop a device for Tagging, Tracking, and Locating (TTL) individuals as well as vehicles and equipment utilizing existing comms architectures.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Provincial Police Force Concept Development and Capability Build	0.877		
FY 2007 Accomplishments: The project's objective is to develop host nation police intelligence and information mechanisms, based on the United Kingdom's Special Branch and other historically effective counterinsurgency (COIN) models.			

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
MAX Link 16 Radio Terminal	1.600		
FY 2007 Accomplishments: Develop a small form factor Link 16 terminal capable of use by Special Operations in high speed watercraft, vehicles, helicopters and stand-alone configurations using			

Weapons Data Link technology under development by the Air Force Research Lab (AFRL).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Development of the Multi-Aperture Sparse Imager Video Systems (MASIVS)	1.500		

FY 2007 Accomplishments: The MASIVS camera system is a four lens system a total of 880 Million total pixels. The MASIVS system focal plane array and readout electronics can be operated at up to 7 frames per second from an airborne or waterborne platform.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Integration and Support of Meissa TacViz Software with Wolf Pack Urban Vehicle	0.484		

FY 2007 Accomplishments: This project integrates the TacViz capabilities into the Wolf Pack Urban Vehicle software and hardware systems to provide enhanced situational awareness and advanced mission recording capabilities for the vehicle operators.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Measuring Progress in Conflict Environments	1.300		

FY 2007 Accomplishments: This project provides a Conflict Transformation Measurement Tool (CTMT) that incorporates a baseline assessment methodology, a system of metrics and an illicit power structure taxonomy to enable practitioners to track progress toward stabilization and ultimately a self-sustaining peace.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
TinMan	1.000		

FY 2007 Accomplishments: The objective of this program is to demonstrate the transmission of RF waveforms via power lines over a wide area.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Combating Terrorism Technology Task Force Testing in YPG	2.484		

Rapid reaction joint services testing support is provided 2 weeks out of every 8 at YPG. These test periods are the opportunity for technologies without enough funding for testing to show their capabilities in a real world setting.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Experimentation, Concepts of Operations, and Rapid Prototyping in Support of Counterterrorism	1.450		

FY 2007 Accomplishments: The objective of this project is to review the current experimentation, concepts of operations, and rapid prototyping approaches utilized by the RRTO; identify potential barriers, both within and outside RRTO; and recommend potential improvements to RRTO approaches.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Full Spectrum Systems Analysis for Countering Insurgent Violence	0.500		

FY 2007 Accomplishments: Initial work by the Naval Postgraduate School (NPS) Defense Analysis Department collected and analyzed data on Iraq and Afghanistan threats, to develop counters to selected current and projected insurgencies.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Stand-off Optical Detection of Trace Explosives	0.939		

FY 2007 Accomplishments: This project is to begin the development of a handheld, stand-off or Remote Explosives Detector (RED). The system will use an invisible eye-safe laser to illuminate the target and selectively display any explosive particles as _glowing hotspots_ on the detector visual display.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Software Reprogrammable Payload (SRP) Aviation Platform Demonstration	0.500		

FY 2007 Accomplishments: The demo will highlight the ability to port communications and intelligence, surveillance, and reconnaissance (ISR) applications across space and terrestrial domains and deploy various hardware platforms. Enabled by Government owned intellectual properties to enable sharing of waveforms and applications.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Creative Media for Fostering Tolerance in the Philippines	0.250		

FY 2007 Accomplishments: The purpose of this effort is to help the US government better understand the role of creative media in fostering democratic values and, secondly, to collect the research necessary to enable US policy makers to support positive indigenous media trends.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Alternative Strategies Program	1.026		

FY 2007 Accomplishments: Alternative Strategies is a coordinated, integrated operational analysis program which stimulates the levers necessary to change the radical Muslim ideological environment. Alternative Strategies integrates several analyses, workshops and conferences to empower activist reformers in the Muslim world and set off an indigenous influence campaign for a liberal counter-movement to the radical ideology.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Phased Approach to Demonstration and Deployment of RealityVision for Critical Counter-Insurgency and Counter-Terrorism Applications	0.050		

FY 2007 Accomplishments: This project identifies organizations within the national security, intelligence, homeland security and law enforcement communities that have common technical and operational requirements in the areas of Force Protection, Command and Control, Intelligence, Surveillance and Reconnaissance (ISR) and operational issues in each of these application areas. Reality Vision brings a mobile networked command, control and communications capability to operational users.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)			February 2008
APPROPRIATION/ BUDGET ACTIVITY **RDTE, Defense Wide BA 03**	PE NUMBER AND TITLE **0603826D8Z - Quick Reactions Special Projects (QRSP)**		PROJECT **P828**
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Modeling Criminal Activity in Asymmetric Threat Environments	0.250		
FY 2007 Accomplishments: Utilizes the Institute for the Study of Violent Groups (ISVG) database and other data sources to model interrelationships between terrorism, gang activity, and organized crime. The ability to accurately model these interrelationships will provide a basis for improved strategies and tactics to disrupt insurgent activities earlier in the planning and execution cycle.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Demonstration of the Ground-based Sensor/Satellite System	1.500		
FY 2007 Accomplishments: This project utilizes Ground-based Sensors to measure atmospheric conditions for correlation with satellite data. The satellite imagery is then corrected to provide better resolution of collected imagery.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Continuum of Force Systems in COIN and Deep Urban Ops	0.320		
FY 2007 Accomplishments: This analysis determines the payoff of a system that can deliver a continuum of force from warning through discomfort through disabling through lethal force.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Stake-holder Asset Based Planning Environment (SHAPE) Pilot Project	0.750		
FY 2007 Accomplishments: This project will deliver a web-enabled planning assessment tool for multinational and interagency stabilization and reconstruction operations that enables the development of integrated self-sustaining solutions.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Lighter Than Air Unmanned Sub-scale Demonstration	2.500		
FY 2007 Accomplishments: The SKYBUS 80 unmanned airship will demonstrate unmanned, scaleable Lighter Than Air Vehicle(LTAV) airship capabilities, techniques, procedures, and manning requirements. Knowledge gained from this demonstration will translate directly into larger, production versions of unmanned LTAVs.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Strategic Assessment of the Sudan	2.505		
FY 2007 Accomplishments: The objective of this effort is to provide context for information resources, information on the background and current situation of the nation-state of Sudan, including the impact of its neighbors.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

TacSat-L	1.000		
FY 2007 Accomplishments: The broad objective is to make space assets more operationally accessible and relevant at the operational and tactical levels. Specific objective is to show a tangible approach and an example to achieve this.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Thermal BFT/LZ Beacon	0.605		
FY 2007 Accomplishments: Develop a SOF compatible passive Thermal Beacon that is easily observable from Forward Looking Infrared (FLIR) targeting and surveillance systems.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Infra-red Networked Awareness (TINA)	1.573		
FY 2007 Accomplishments: This project has provided a unique communications and tactical visualization capability to the operative in theater.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
10th Special Forces Group (Airborne), Technical Support Detachment	0.700		
FY 2007 Accomplishments: This is a proof of concept phase to determine the optimal training, organization and equipment necessary to conduct sensitive site exploitation and related technical operations on the battlefield.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tracking Terrorists Using New Methods of Analysis and Communication	0.200		
FY 2007 Accomplishments: This project is a short-term analysis of up to ten theaters of operation where global jihadist and criminal networks are likely to operate beyond the light of public scrutiny and where facilities to produce new weapons of mass terror can be located.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Jihadist Video Content Geolocational Technology Integration	0.330		
FY 2007 Accomplishments: To develop a functioning prototype video exploitation technology integration cell to identify physical locations from the content of terrorist and/or insurgent videos. This video exploitation cell is intended to provide timely and accurate geo-locational information to the customer and their deployed elements.			
Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Ongoing Projects and Remaining FY07 Funding	5.709		
RRTO has several projects that are awaiting FY07 funds; investment decisions are made during the execution year in response to combatant commander, service and other government organization's requirements and new threats/new opportunities.			

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P828**

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2008/2009 Plans:		50.073	50.960

RRF investment decisions are made during the execution years in response to combatant commander, service and other government organization's requirements and new threats/new opportunities. Research and coordination with organizations throughout DoD and other government agencies have identified areas critical to developing future counterterrorism/counterinsurgency capabilities. These areas include: small unit situation awareness, program synchronization, non-kinetic operations, strategic communications, biometrics and forensic applications, persistent surveillance infrastructure, maritime surveillance, small unit dispersed capabilities within specific geographic areas, cross organization / agency projects, network war concept development and strategic multi-layer assessments.

RRTOs FY08 objectives include: increased interagency funding and program integration through co-funded programs and regular information sharing, the integration of earlier fiscal year efforts into coordinated architectures with specific operational areas of focus, and transition and manufacturing strategies for programs underway or to be started.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**P829**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P829	Technology Transition Initiative (TTI)	26.707	28.998	30.983	31.761	29.979	30.378	30.806

A. Mission Description and Budget Item 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 the 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 successfully demonstrate new technologies in relevant environments and accelerate the introduction of new technologies into operational capabilities for the armed forces.

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 members receive proposals from their Service/Defense Agency S&T base, conduct a prioritization based on Joint, Service or Agency capabilities needed and submit them to the OSD TTI Program Manager. The Technology Manager's senior staff consolidates the proposal submissions, evaluates the Service/Agency recommendations, reviews new start selection options based on available resources, and prepares a recommended new start selection list to the Technology Transition Manager for funding. The Technology Transition Manager, in coordination with the TTC, selects the highest priority proposals for funding.

The FY 2008 proposal call memo was signed out by the Technology Transition Manager on February 20, 2007, requesting the Services, Agencies and CoComs provide their prioritized inputs by April 23. These proposals were to focus on projects having great impact for the warfighter, (i.e., potentially fewer projects with larger dollar values). The memo also indicated that OSD priorities were for technologies that could reduce demands on manpower, increase lethality, and/or reduce our logistics footprint. Each Service/Agency was asked to limit their submittals to OSD to a total of ten/five respectively. A total of 34 proposals were formally submitted to OSD. These proposals were evaluated against the following evaluation criteria: TTI funding must accelerate product transition, project is from DoD S&T base, cost sharing to leverage TTI funding, project duration less than 4 years, established exit criteria, potential for joint use, value to the warfighter, sufficient technology maturity, commitment to transition/acquisition. The evaluation team down selected to 17 proposals which were briefed to the selection panel. In November 2007, 12 TTI efforts were approved by the Technology Transition Manager as new start projects to be implemented in FY 2008.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009

Husky Mounted IED and Anti-Tank Mine Detection System (Army)	0.965		

This project will provide a near-term, highly effective capability to US forces in Iraq and Afghanistan to detect anti-vehicle landmines and improvised explosive devices (IED's). Additional information is For Official Use Only (FOUO).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Advanced Digital Multi-Spectral Night Vision Goggles (SOCOM)	3.008		

The USSOCOM Requirements Evaluation board approved the Special Operations Visual Augmentation System Binocular/Monocular Capability Development Document (Spiral 2) which validates the requirement for multi-spectral or hyper-spectral fusion of image intensification, colorized image intensification, thermal imaging, and other advanced imaging technologies as they reach operational maturity. The outcome of the Advanced Digital Multi-Spectral Night Vision Goggles (ADMNVG) project is the development of a goggle which will utilize digital technology to generate an image composed from multiple spectrums; I2-Image Intensification, Long Wave Infrared (LWIR), and Short Wave Infrared (SWIR) providing a scene composed of multiple wave bands. The imagery generated from the ADMNVG 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 and display video from external sources to the soldier. The ADMNVG 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 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 ADMNVG via vehicle power, via other larger batteries for extended periods of operation, and will allow the soldier to scavenge for power. The project is a two year effort starting in FY 2006 and transitioning to acquisition in FY 2008.

The primary output and efficiencies to be demonstrated are the development of a system which increases the soldier's ability to identify threats and targets with improved speed and accuracy thereby improving battlefield awareness in darkness and poor visibility while also reducing weight and power consumption beyond that of currently fielded systems.

FY 2007 Accomplished: Completed the following efforts: fusion processor and algorithms; optics design and fabrication; fabrication of battery pack and establishment of power management methods and power sources; establishment of the ADMNVG configuration; and definition of deliverables. SWIR and LWIR camera development and integration; goggle assembly and housing build; establishment of production tooling and processes; goggle delivery, test and evaluation with final report; and transition of the system to acquisition.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
F135 Refractory Metal Core (RMC) Casting (Navy)	0.866		

This initiative will demonstrate advanced manufacturing process capability for jet engine turbines and provide the catalyst for production incorporation in the Joint Strike Fighter (JSF) F135 engine. The project develops a casting process that uses a Refractory Metal Core (RMC) to manufacture advanced cooling features, known as microcircuit cooling, into turbine vanes, blades and blade outer air seals (BOAS). This technology allows the turbine airfoil designer to incorporate finer features in turbine hardware to enhance heat transfer characteristics. The TTI project would demonstrate the new production process by conducting casting trials on the F135 1st stage high turbine vane and BOAS. The casting trials would be spread over a 2-year period to maximize process learning. A sufficient quantity of mold trials will be conducted to verify learning curve assumptions and progress towards cost targets. The castings that are produced by the mold trials would be incorporated into F135 development and qualification test engines.

Primary outputs and efficiencies of this project are: 1) a fully qualified high pressure turbine (HPT) vane and blade outer air seals (BOAS) for the Joint Strike Fighter F135 engine, and the demonstration of process readiness for complex applications of RMC's to 1st stage blades. 2) The improved heat transfer in a turbine airfoil can provide an additional 150 F temperature capability or a 2X life improvement and resulting 2x cost savings over a conventionally cast airfoil. 3) By demonstrating that a viable production process exists and cost targets can be met and by successfully completing qualification testing, the RMC vane and BOAS would enter production early in the F135 program during Low Rate Initial Production (LRIP) 3.

FY2007 Output: 1) F135 1st Vane & 1st BOAS: production quality RMC tooling development; casting mold development; inspection development and validation. 2) F135 RMC 1st Blade: follow-on dem/FL1 of RMC development and casting trials, inspection development and validation.

FY 2008 Planned Output: FY 2007 funds will continue to provide the following FY 2008 planned actions: F135 1st Vane & 1st BOAS: production quality RMC tooling development; casting mold development; inspection development and validation. 2) F135 RMC 1st Blade: follow-on demonstration of RMC development and casting trials, inspection development and validation

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Flameless Ration Heater (FRH) (Army)	0.249		

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 waste in bulk issue, 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 project will overcome or greatly lessen these safety, environmental, transportation, storage and readiness issues.

The outcome of this program will be the incorporation of a safe, disposable and readily transportable heater into the Meal, Ready-to-Eat (MRE) ration.

FY 2007 Accomplished: Completed the analysis of the Fort Lewis field test data to verify soldier acceptance of candidate heaters. An additional evaluation and focus group was conducted at the Army Mountain Warfare School in Jericho, VT. Using soldier feedback, heater designs were modified where possible to improve usage and acceptance. Accelerated shelf life testing of candidate heaters was initiated - heaters must have a three year shelf life to be included as a component of the MRE. Rough handling testing of candidate heaters was completed. The outcome of this effort was an improvement in package design modification to increase heater durability at cold temperatures. The Phase II producibility assessment contract was awarded to ensure heaters with design modifications were properly designed for manufacturability. A cost-benefit analysis was conducted on candidate heaters. The results of this analysis were considered as an efficiency measure in that added benefits of a safer, non-hydrogen producing heater may justify additional cost of the item. Results of developmental efforts and soldier acceptance will be presented to Service representatives for decision on whether to continue efforts to include one or both candidate heaters in the MRE. As final output of this project, performance based specifications will be prepared for one or both candidate heaters for future procurement of the item through the Defense Logistics Agency (DLA). Final decision for the addition of alternate heaters to the MRE assembly document is scheduled to be made by a Joint Service decision board that may be held in conjunction with the annual DoD Combat Feeding Research & Engineering Board meeting in FY08.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Fires and Effects Trainer System (JFETS) (Army)	0.216		

JFETS is a collective training system that provides an immersive simulated battlefield for training Joint Fires Observers at the Institutional level, and it will use immersive training technologies to train current and future applications of joint fires. JFETS has been sustained through Congressional Plus-Up funds since FY 2003, and was funded in the service's Program Objective Memorandum (POM) submittal for FY 2008-2013.

Research, Development & Engineering Command (RDECOM) will provide the following to facilitate the transition of JFETS into Call For Fire Trainer (CFFT): JFETS Part Number, Description (baseline), System Specification Document, Software Product Specification, Software Design Document, Bill of Material, Software Installation Procedure Document, Drawings, components, connectivity (all configurations), Configuration Management System (CMS), Users manual.

FY 2007 Accomplished: Deliver of the initial technical data package in the 4th quarter of FY 2007, to include the information mentioned above. Delivery of the Close Air Support Module (CASM) and the After Action Report (AAR) application for integration into CFFT. Development of the Fires and Effects Command (FECM), the last JFETS module to be developed.

FY 2008 Planned Output: FY 2007 funds will continue to provide the following FY 2008 planned actions: Delivery of the final technical data package in 4Q of FY 2008, including information associated with the development of the FECM. Final demonstration and completion during the 4Q of FY 2008. Continue with the full production of the CFFT for deployment in support of the Warfighter. The JFETS system will be deliverable from FY 2009 through FY 2011.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Land/Littoral Battle Command Warfighter Interface (Army)	2.102		

The Command Post of the Future (CPOF) is a high priority, DARPA-developed technology program that provides a software suite of collaboration tools accessed through a superior intuitive human-computer interface (HCI), which is rapidly becoming a defacto capability of choice from Corps down through Battalion. CPOF formally transitioned to the Army Acquisition Community in mid-2006. 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) 1 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 the current near/mid-term tactical level single common C2 solution mandated by the Joint Requirements Oversight Council (JROC) 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 will accelerate the transition and application of CPOF-based HCI technology into the unified Army-Marine Corps JTCW system by approximately 18 months.

FY 2007 Accomplished: Completed comprehensive usability engineering and human computer interface assessments on the latest version of JTCW client and JTCW Tri-Service "Injectors." Completed analysis and insure detailed understanding of the interface between application software and HCI for JTCW Client. Initiated development of a common interface template prototype for this CPOF-based client presentation layer that can subsequently be used by battle command software development activities. Define and document the application program interfaces (UI Framework) for a CPOF-based single JTCW client presentation layer. Completed definition and documentation of a HCI design guidance package for this CPOF-based client presentation layer. Completed development of a common interface template prototype for this CPOF-based client presentation layer that can subsequently be used by battle command software development activities.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Logistics Base Planning for AIF Authority Transition	0.341		

This program addresses an emerging requirement for logistics units resulting from (Operation Iraqi Freedom) OIF and the transition of authority to the Iraqi Security Forces (ISF). The outcome of this program is to provide a collection of log base planning tools that will allow US logistics units to provide support for both US and ISF forces in the context of transitioning authority to the ISF. This is a two year effort with participation and field evaluation from I MEF, and III Corps. The log base planning tools developed will be transitioned into the Joint Tactical Common Operational Picture Workstation (JTCW) by the end of FY 2007.

The primary outputs and efficiencies include: (1) Percentage reduction in the time to develop combat service support plans (goal in 35% reduction), (2) Percentage reduction in transportation requirements to satisfy support requirements (goal is 10%), (3) Percentage reduction in time to configure and load equipment for re-supply missions (goal is 30%), (4) percentage reduction in size of logistics units (goal is 25%). The logistics support areas to be addressed in this effort are: Class 1 (Food/Water), Class 3 (Fuel), Class 4 (Construction materials), Class 5 (Ammunition), Class 7 (End Items), Class 8 (Medical), Class 9 (Maintenance Parts), Re-supply.

FY 2007 Accomplishments: Developed consumption models for the classes identified above. Deployment and Redeployment Interface, tools for Sea and Air planner, re-supply functions, push or

routine re-supply planner (LOGPAC Planner), Pull Re-supply, Convoy Planner, Calculate and reserve Road Space Utilization, Danger Zone Avoidance, Convoy Security, Include ability to build complex convoys (convoys of convoys), Auto CSS Task Org function, Development of re-supply models, Support and Service requirements, Delivery mechanism allocation, Delivery scheduler, Delivery resource loader, Delivery Scheduler, Inventory manager, Incorporate concepts of Priority of Support and Priority of Effort, Auto-displacement of LOG Bases (Cbt Trains, BSA, DSA, LOG BASES) based on tactical situation. (Includes expansion of smart GCMs to echeloned rear boundaries and No PEN Lines).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Monolithic Microwave Integrated Circuit (MMIC) Enhancement for DD(X) DBR/SPY-3 Radar (Navy)	0.985		

The primary objective of the Monolithic Microwave Integrated Circuit (MMIC) Yield and Efficiency Enhancement for DDG-1000 Dual Band Radar (DBR)/SPY-3 Radar project is to improve the manufacturing process of the 0.5um Gallium Arsenide (GaAs) pseudomorphic High Electron Mobility Transistor (pHEMT) based high power amplifier MMIC. This MMIC is the key power generation component used in the DDG-1000 SPY-3 phased array radar. This project will improve the efficiency of the production line and system performance for the DDG-1000 SPY-3 phased array radar.

The primary outputs of this program are: 1) 10% - 20% MMIC yield improvement resulting in significant MMIC component cost reduction; 2) 10% point increase in MMIC efficiency and associated Improvements in array transmit/receive module and array efficiency, significantly reducing ship system power generation loads and stresses.

FY 2007 Accomplished: Completed MMIC production process dramatically improving MMIC production yield, performance and stability; improved RF circuitry technology providing significant MMIC output power with same input power (power added efficiency). Task 1: Baseline MMIC - Development and exercise of the baseline production process for identification of baseline performance and process improvements, and resulting in a manufacturing process configuration freeze. Task 2: Reliability MMIC - Production and demonstration of a specially configured MMIC for reliability compliance. Task 3: Producibility MMIC - Manufacture and testing of a scaled production quantity of DDG-1000 SPY-3 high power MMICs, resulting in full production release of manufacturing process.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Red Blood Cell Extended Life (RBCXL) (Army)	1.416		

RBCXL addresses requirements validated in the Initial Capabilities Document (ICD) for Ground Contingency Medical Support System, approved by the Air Force in 2003 and documented in the Army's 2005 draft ICD for Theater Combat Casualty Care. The outcome of RBCXL is an FDA approved blood collection and storage system that provides capability to collect and store human red blood cells (RBCs) at an FDA-defined level of functionality and safety for at least eight weeks, and potentially for up to 12 weeks. The 26 month project will be managed by the US Army Medical Materiel Development Activity (USAMMDA) in collaboration with Hemerus Medical, LLC, Saint Paul, MN with completion of manufacturing development and validation and completion of product testing and evaluation by September 2008.

The primary outputs and efficiencies to be demonstrated during development include: (1) safety of system materials when tested in animals, (2) prolonged storage life of human RBCs, (3) enhanced RBC quality and function with in vitro (test tube) testing compared to current RBC storage at each time interval tested, and (4) safety and equal or enhanced RBC survival when infused into human volunteers.

FY 2007 Accomplished: Conducted and completed the following: (1) animal testing protocol development and submitted protocols for scientific and ethical review; (2) manufacturing development, testing, and validation; (3) pre-clinical animal toxicology studies; (4) clinical in vitro study; (5) clinical protocol development; clinical testing of RBCXL.

FY 2008 Planned Output: FY 2007 funds will continue to provide the following FY 2008 planned actions: Following final study reports, a formal application to US Food and Drug Administration (USFDA) to conduct clinical in vivo study; clinical protocol for local and Army human use review and an application to USFDA for licensure of RBCXL for commercial clinical will be submitted

during the Fall 2008 timeframe.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Semantic Web II -- Transition to Additional Commands (NGA)	0.649		

The Technical Support Working Group (TSWG), on behalf of the Joint IED Defeat Organization and its US Army and Special Forces customers, validated the need for extending the capabilities of the Semantic Web Network. The outcome of this effort is to seamlessly deliver National and multi-service tactical intelligence via the Semantic Web Network to an experimental predictive analysis cell at Ft. Bragg, with eventual transition paths to Special Forces and US Army operational units in theater. 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 and Operational databases in real-time. The Functional Capability Area for this technology is Net-Centric Warfare, supporting Command and Control. Specific uses of the technology by the Marine Corps have been for Rapid Planning (R2P2) and Intelligence Preparation of the Battlefield (IPB). This is a two-year project with completion of development and demonstration by end of CY 2006, and transition to support 3rd and 7th Special Forces Groups, Army 10th Mountain Battalion and a Marine Battalion by FY 2008.

The primary outputs and efficiencies to be demonstrated in this effort are significantly reduced search times for information required for operational planning (reduced from hours to seconds/minutes), and better information available for decisions - typically, information from more sources than would otherwise have been used, and fewer irrelevant documents such as sometimes returned by search engines in their results list.

FY 2007 Accomplished: Initiated integration Commended integration of the capability with the overall Army Special Operations Command. Following complete integration in late FY 2007 through early FY 2008, the program will begin transition to the Program of Record, Special Operations Advanced Technology Development.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Thermal Battery for Precision Guided Munitions (Army)	1.699		

The Army has established performance and cost goals for the Excalibur Precision Munition Thermal Batteries. While the Program of Record (POR) has met performance metrics, the manufacturing readiness within the industrial base lags technology readiness--thus impacting cost of thermal battery production. The outcome of the program is to transition a production-ready manufacturing process for Excalibur Thermal Batteries in advance of full-rate production that meets the cost metrics established by the POR. Transition will result in cost avoidance of $50/thermal battery, a 10% reduction in reject rate, and a 25% improvement in production rate. Transition is scheduled to occur in the 2nd QTR FY08. The transition manager will be the Program Management Office for Excalibur.

These manufacturing enhancements come as a direct result of a number of investments in small business innovative research programs (SBIR), manufacturing technology (ManTech) programs, and the S&T community.

FY 2007 Accomplished: Subsequent to the work completed in FY 2006, final operational demonstration was conducted to demonstrate that the manufacturing readiness meets the cost goals established by the program of record. Transition of production ready manufacturing processes to the program of record began in the 4th QTR of FY 2007.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
AIM-9X Electric Arm Fire Device (EAFD) (Navy)	2.028	0.463	

The Joint Requirements Oversight Council (JROC) validated the early transition of "In-Line" Electric Arm Fire Device (EAFD) with Exploding Foil Deflagrating Initiator (EFDI) Technology into the AIM-9X Sidewinder Missile Air-to-Air Weapon System as a FY07 new start. The outcome of early EAFD transition is enhanced US Navy aircraft carrier flight deck operations, a significant

reduction in USN/USAF logistic support costs, greater weapons system reliability and enhanced system safety. The two-year project is under the sponsorship of Naval Air Systems Command (NAVAIR) Program Executive Office for Weapons PEO(W) Program Management Activity with transition to production in CY2008. The lead service is the Navy.

The primary outputs of this early transition program are as follows: 1) Eliminates the current burden on ordnance crews to manually arm/disarm AIM-9X Sidewinder missiles after every sortie; 2) Improves cold weather flight operations; 3) Improves Nuclear, Biological, Chemical Operations; 4) Eliminates logical reprogramming operations; 5) Improves 9X Weapon System Probability of Launch by 1%-3%; 6) Lowers weapon system radar cross section planar cross section on aircraft; 6) Enhances weapon system safety; 7) Enables 9X Sidewinder canister employment (i.e., USN Sea Serpent).

FY 2007 Accomplished: Qualification testing of Exploding Foil Deflagrating Initiator (EFDI) subassembly completed. Qualification of Electronic Arm Fire Device (EAFD) component completed. Began integration and design verification testing of EAFD with the Block II Sidewinder air-to-air missile. Initiated design coordination with Safety Boards.

FY 2008 Planned Output: Completion of the following events: integration and design verification testing of EAFD with Block II 9X Sidewinder; and ground based environmental qualification testing of EAFD with Block II 9X Sidewinder. Qualification testing is scheduled for May 2008. Transition EAFD with EFDI technology into Block II 9X Sidewinder production with Engineering Change Proposal (ECP) approval. ECP approval is projected to occur in November 2008. Transition Manager is NAVAIR, PEO(W), PMA-259.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Automated ALRE Reading (AutoREAD) Sheets (Navy)	1.055	0.427	

AutoREAD is an automation and process improvement project that uses personal data assistants (PDAs) to eliminate paper logkeeping and streamline the collection, analysis, and reporting of launch and recovery equipment preventative maintenance measurement data. Its purpose is to reduce Aircraft Launch and Recovery Equipment (ALRE) maintenance workload and gain improvements in equipment readiness, safety, engineering support, and fleet metrics. It creates an infrastructure for continuous ALRE reliability improvement into the future.

The primary outputs and efficiencies of this program are as follows: 1) Improvements in quality, accuracy and legibility of measurement data by 20%; 2) Process improvement from the use of integrated Reading Sheets (1-2 hours per maintenance action); 3) Process improvement from the use of electronic signatures on arresting gear (AG) Reading Sheets (1 hour savings per maintenance action); 4) Reduce effort and cost required to track completion of Maintenance Actions with associated Reading Sheet data.

FY 2007 Accomplished: Development of software requirements specification, system design. Coding and Testing of AutoREAD including Integration testing with Aviation Data Management and Control System (ADMACS). Procurement of hardware for initial ship test. Successfully demonstrate AutoREAD application.

FY 2008 Planned Output: Land Based integration testing, ship board integration testing, and production deliveries. Complete transition of AutoREAD under ADMACS Block 2. The planned elements of AutoREAD will be demonstrated as a component of ADMACS block 2 production deliveries.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Diagnostics Avionics Tester for On-aircraft Maintenance (Navy)	0.341	0.787	

The F/A-18 Program Office has an immediate need for Support Equipment (SE) items that can reduce maintenance costs, and reduce ambiguities between systems and components at the on-aircraft maintenance level. The outcome of the "Diagnostics Avionics Tester for On-Aircraft Maintenance" Technology Transition Initiative (TTI) project will be to incorporate net-centric diagnostics technologies into the Tactical Reconnaissance (TAC RECCE) and Electro-Optical Infrared (EO/IR) F/A-18 Maintenance Programs by developing a prototype Diagnostics Avionics Tester and Net-Centric Diagnostics Framework that can replace the AN/USM-681 Electro-Optics Pallet/Pod Tester (EOPT).

The exit criteria will be a successful demonstration of the prototype Diagnostics Avionics Tester and Net-Centric Diagnostics Framework with a F/A-18 squadron equipped with the AN/ASQ-228 Advanced Targeting Forward Looking Infrared (ATFLIR) Pod and a F/A-18 squadron equipped with the AN/ASD-12 Shared Reconnaissance Pod (SHARP).

The primary outputs and efficiencies include: a one percent increase in ATFLIR and SHARP operational availability; (2) cost reduction for maintenance and repair; (3) percent increase in fault detection and fault isolation rates; (4) run time reduction for F/A-18 Automated Test Equipment at the off-aircraft maintenance level; (5) percent reduction in false alarms/cannot-duplicate occurrences; and (6) percent reduction in logistics footprint for the new Support Equipment at the on-aircraft maintenance level.
One prototype and a Level 3 technical data package will be provided to the F/A-18 Program Office. The F/A-18 Program Office will procure production versions of the Diagnostics Avionics Tester and Net-Centric Diagnostics Framework beginning in FY 2008 with life cycle support implemented in the first year of procurement. Deliverables will be due in FY 2009 and FY 2010.

FY 2007 Accomplished: Procurement of militarized commercial-off-the-shelf (COTS) tablet PC to serve as the processor unit for the prototype Diagnostics Avionics Tester. Completion of development of the avionics interface for the prototype Diagnostics Avionics Tester. Completion of first software builds for the Net-Centric Diagnostics Framework, ATFLIR Computer Software Configuration Item (CSCI), and SHARP CSCI.

FY 2008 Planned Output: Diagnostics Avionics Tester and Net-Centric Diagnostics Framework successful completion of all test efforts and approval for flightline use. Demonstrate prototype Diagnostics Avionics Tester and Net-Centric Diagnostics Framework at a F/A-18 squadron equipped with the AN/ASQ-228 ATFLIR Pod, and a F/A-18 squadron equipped with the AN/ASD-12 SHARP. Provide one prototype and a Level 3 technical data package (TDP) to the F/A-18 Program Office. Incorporate net-centric diagnostics technologies into the Tactical Reconnaissance and Elector-optic/Infrared F/A-18 Maintenance Programs by procuring production versions of the Diagnostics Avionics Tester and Net-Centric Diagnostics Framework to replace the AN/USM-681 Electro-Optics Pallet/PoD tester (EOPT).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Image Compression for Digital Precision Strike Suite (Navy)	0.325	0.459	

The purpose of the Image Compression for Digital Precision Strike Suite project is to transition a matured compression software suite to Special Operations Forces (SOF) that will shorten the upload time for image and video data files. It provides a much needed capability to mitigate bandwidth limited communications problems without compromising the image quality and information needed for subsequent analysis upstream.

The primary outputs of this program are as follows: A compression software suite with high quality image and high compression ratio for SOF radios that mitigate today's communication data link issues.

FY 2007 Accomplished: Implementation of the software suite on Precision Strike Suite - SOF laptops.

FY 2008 Planned Output: Testing and validation in field units.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
N-Acetylcysteine (NAC) Clinical Trials for Hearing Loss Prevention (Navy)	1.623	1.068	

The Joint Requirements Oversight Council (JROC) validated the capability need for the investigation into NAC for prevention of hearing loss. The outcome of the project is to facilitate the final transfer of this cutting edge pharmacological technology of antioxidant therapy for the prevention and reduction of hearing loss from the basic science laboratory into the operational environment. This two-year project is under sponsorship of Navy Medical Research Center, with completion of development and demonstration by end of FY 2008, transition to pharmacy by FY 2009.

The primary output for this study is a 40 to 50% reduction in average threshold shifts for NAC participants compared to placebo.

FY 2007 Accomplished: Completed clinical study preparation, documentation and site preparation and initiation.

FY 2008 Planned Output: Study execution, data analysis, FDA approval. Begin transition with acquisition of national stock number through the Defense Medical Standardization Board. Complete transition via Tri-Care Management Authority for Pharmacy and integration into operational forces.

This project was previously referred to as "Prevention of Hearing Loss -- Hearing Pill"

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Operational Gliders for Battlespace Reconnaissance and USV Surveillance (Navy)	1.900	0.854	

The Chief of Naval Operations and the Oceanographer of the Navy validated the requirement for an operational glider for battlespace reconnaissance and included ocean gliders as part of the Littoral Battlespace Sensing, Fusion and Integration (LBSF&I) Program of Record. The Technology Transition Initiative will accelerate the transition of ocean gliders to operational readiness.

The outcome of this program is the development of robust ocean gliders that are certified for operational deployment (six prototypes of improved and hardened gliders will be initially delivered) together with an operationally feasible (roll-on, roll-off) deployment and recovery system, a command and control system, and an approved manufacturing process. The completion of the operational glider prototypes, all other deliverables, demonstrations and documentations will be completed at the end of FY2008; the TTI Program funding accelerates the achievement of technical readiness by 36 months (FY2008 vs. FY2011).

The primary output and efficiency to be achieved in this project is operationally robust underwater gliders that 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. Additional outputs and efficiencies include the following: (1) glider configuration such that they can accommodate optical sensors that facilitate non-acoustic Anti-Submarine Warfare (ASW) measurements; (2) an approved manufacturing capability so that acquisition of large numbers of gliders can facilitate the fleet establishing networks of 10-30 gliders. (These networks of gliders provide real-time environmental data in the operational area of interest. These data provide mission planning modules with the initial and evolving deep or shallow water environmental data); (3) gliders with the capability to provide long duration sampling (1 month to 3 months), and to provide real-time data at a far lower cost (present estimate is $4 per glider vertical profile vs. present cost of $1000 per profile via ship) with immediate delivery of data to operational fleet commands; (4) gliders that, once deployed, do not (now) and will not require support from fleet assets such as ships, aircraft, or submersible platforms; piloting and data flow will be remote but real-time with global coverage. The project will achieve roll-on-roll-off deployment from surface platforms and a common command and control system for all glider types.

FY 2007 Accomplished: Construction of prototype gliders incorporating the new rechargeable battery systems and the new wings and antenna options; the battery systems and the prototypes undergo standard NAVSEA testing including implosion, explosion, stress testing, off-gas testing and design review; revised wings, antennas and deployment and recovery systems undergo at-sea testing during Naval exercises as part of a build-test-build cycle that lead to the optimized design; deployment and recovery hardware constructed and tested on-board several candidate naval vessels; work towards an approved manufacturing and design process; deployment of the Command and Control System software, and testing against operational gliders in Exercise Valiant Shield; documentation of the improved designs and processes and implementation of a configuration control system; demonstration and evaluation of the adaptive sampling algorithms during the Exercise Valiant Shield 2007.

FY 2008 Planned Output: Remaining prototypes will be constructed by the end of FY2008. There will be six prototypes of improved and hardened gliders available for use by the Navy. The approval and certification of the manufacturing process will continue and documentation and configuration control systems will be completed. The final prototypes, along with the deployment/recovery systems and command system will be tested at sea. Remaining modifications will be completed leading to an operational glider design and six hardened gliders. Approvals and

certifications will be completed. The design criteria and tested prototypes are timed to be synchronous with the initiation of LBSF& I funding for acquisition.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Self-Powered Tray Ration Heater (Army)	0.325	0.517	

The objective of the Self-Powered Tray Ration Heater (TRH) project is to apply thermoelectric technology to a standard TRH to enable operation independent of vehicles and generators. The TRH was designed to heat 18 six-pound packages of shelf stable food (tray packs) for Company-sized groups of Warfighters. The TRH uses a commercial oil burner (configured to burn JP8) to heat 10-15 gallons of water to close to 200°F. This allows tray packs to be placed in the hot water for 30 minutes to bring them up to serving temperatures. Versions of the TRH are used by the Army in the Assault Kitchen (AK), the Marine Corps in the Tray Ration Heating System, and the Air Force in the Single Pallet Expeditionary Kitchen. A secondary objective of this program is to provide a universal STRH that all four services as well as FEMA can procure, operate and support. The current TRH requires approximately 200 watts of power for operation, which must be supplied by a HMMWV or generator. A self-powered capability improves overall reliability, availability, and maintainability characteristics, since a generator or vehicle power supply are inherently less reliable and require more maintenance than solid-state thermoelectric modules. Due to the limited number of HMMWVs available to Food Service, alternative mounting configurations with HMMWV trailers are needed. The self-power version of the TRH along with a Trailer mounted version of the AK will allow the HMMWV to be used for other missions when the AK is set up and feeding Warfighters. This project has applications to all DoD services and FEMA.

The primary outputs of this program are as follows: a standard TRH to enable operation independent of vehicles and generators.

FY 2007 Accomplished: Conducted in-house technical and operational tests; producibility study; and production of 10 test units.

FY 2008 Planned Output: Technical and operational tests in the field; update of Technical Data Packages and Technical Manuals; development of joint requirement and procurement document; transfer to procurement.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Sense and Avoid (SAA) for Small UAVs (SUAV) (Air Force)	0.649	0.214	

Air Force has validated the need for a Sense and Avoid (SAA) capability for Small Unmanned Aircraft Systems (SUASs). The outcome of Small Sense and Avoid System (SSAASy) is to create a miniaturized version of Air Force Research Laboratories' (AFRL) Phase-I Advanced Technology Demonstration SAA system developed for the RQ-4 Global Hawk UAS. The miniaturized system will include the hardware and software necessary to alert the ground-based pilot and/or an on-board collision avoidance maneuvering subsystem of any potential collisions. The system enhances the situational awareness of a SUAS in both the National Airspace System (NAS) and in operational environments, and will go a long way in meeting the Federal Aviation Administration's standards for granting UASs access to the NAS. Development and demonstration will be completed by FY10/2Qtr. Transition will be to both the Air Force Small UAS office and to the Army Project Manager for UASs in FY 2010.

The primary outputs and efficiencies to be demonstrated in this technology transition initiative are (1) decrease in the hardware's size, weight, and power to fit in the RQ-7 Shadow size SUAS; (2) identification of and creation of software architecture able to integrate SAA data seamlessly with SUASs' ground control stations; (3) identification of and creation of a system that requires minimal modification to the unmanned aircraft; and (4) estimated 24 month advancement of a SAA system transitioning to the field.

FY2007 Accomplishments: Completed design and system prototype fabrication. Completed size, weight, and power (SWAP) trade study

FY2008 Planned Output: Completion of flight demonstration; transition of technical solution to the Shadow UAS program

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Unmanned Surface Vehicles for Littoral Combat Ship Missions (Navy)	2.000	2.135	

The Joint Requirements Oversight Council (JROC) validated the capability need for Unmanned Sea Surface Vehicles (USSVs) for Littoral Combat Ship (LCS) Missions. The outcome of this TTI program will provide enhanced capabilities, via the USSV, that will be a key enabler for 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 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 acquisition for deployment on the LCS.

The output of the project will be to design and build an advanced USSV that is optimized for LCS missions. The lead service is the Navy.

FY2007 Accomplished: Completion of construction of the USSV; Performance Test/Builder's Trials; Payload Integration & installation of the payload aboard the USSV; Mine Influence/USSV At-Sea Test: testing of the performance of the mine influence/USSV system on a range. Spiral Output: this TTI program will accelerate development of the USSV so that it can be transitioned into LCS Flight 0 in 2007, which represents a two-year acceleration. USSV-Payload #2: identification of a second payload (either another mine influence payload or an antisubmarine warfare (ASW) payload) and detailed requirements for weight, space, power and arrangements for the identified system. Both payloads are required by the LCS Mission Module Program Office. USSV Modifications: A USSV will be modified to accept the second payload.

FY2008 Planned Output: The second payload will be installed on the USSV. Payload/USSV At-Sea Test: the performance of the Payload/USSV system will be characterized in at-sea tests. Deliver to LCS Mission Module Program Office: Technical package describing the Payload/USSV system. The Transition Manager for this TTI Program is the LCS Mission Module Program Office. Final demonstration dates are September 2007 and September 2008. TTI program completion date is 30 September 2008.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Warfighter Hearing Enhancement and Protection (Navy)	1.515	1.495	

In FY 2006 Office of the Chief of Naval Operations (OPNAV) validated the need to improve aircraft carrier flight deck crew helmets, including better hearing protection and communication ability, by establishing the Flight Deck Cranial (FDC) program. The FDC is to surpass existing helmet performance in key areas related to safety standard compliance and life cycle efficiency per FY 2005 Deputy Assistant Secretary Navy (Safety) Business Case Analysis. FDC is sponsored by OPNAV N8 with planned transition to U.S. Navy operational commands in FY 2010. Transition PM is Naval Air Systems Command PMA202 Aircrew Systems.

An Evolutionary Acquisition Strategy and a Spiral Development approach will be used to deploy qualified hearing enhancement and protection equipment technologies: (1) replace existing subsystems during routine maintenance, (2) Engineering Change Proposal (or similar) to existing hearing / head protector, (3) system replacement to attrited system(s), and (4) standardized system acquisition. FDC system outputs and efficiencies include (1) American National Standards Institute (ANSI) speech intelligibility test demonstrates 20% gain or more, (2) ANSI hearing protection test demonstrates 3 dB gain or more, (3) greater than 50% use the hearing protection correctly (current estimate is 7%), (4) fit an estimated 95% of the U.S. Navy personnel population (size, shape, gender, race), (5) meets/exceeds ANSI head protection standard, (6) compatible with chem-bio and fire protection clothing.

FY 2007 Accomplished: Initiated custom earplug (without communication capability) fit trial on 200+ U.S Atlantic Fleet aviation personnel; trial results incorporated into design and process refinement; integration of suite of S&T hearing protection and communication products in existing flight deck helmet; completion of systems-level performance and environmental laboratory testing and initiate operational trials. Spiral Output - approved qualified subsystems for fleet use by direct procurement.

FY 2008 Output: Final Operational Demonstration of hearing enhancement and protection technologies will be March 2008. Develop Integrated Logistics Support Plan (Implementation,

Configuration Control, Maintenance, Tech Manuals, Training Package, etc) to transition hearing protection and communication technologies for use in existing flight deck helmet. Spiral Output - approve existing flight deck helmet with improved hearing protection and communication technologies for fleet procurement. TTI Efforts Culminate in Follow-on POM-08 RDT&E and OPN Procurement

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Battlespace Terrain and Reasoning Awareness Battle Command (BTRA-BC) (Army)	2.450	0.746	0.631

BTRA-BC transitions terrain, atmospheric and weather analytic Tactical Decision Aids (TDAs) in support of Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). TDA software for transition operates at two levels: 1) TDAs that operate over large data sets to create actionable information of the effects of the terrain, atmosphere and weather on units, tactics, ground and air platforms, systems and sensors and the soldier and 2) TDAs that perform mission and task level analysis in support of the Military Decision Making Process (MDMP), planning, Course of Action Analysis (COA), asset management and execution monitoring.
Specific TDAs developing actionable information address topics of: 1) Observation and Fields of Fire, Cover and electro-optical concealment, Obstacles, Key Terrain and Avenues of Approach, 2) platform mobility and unit maneuver incorporating weather effects, 3) interactive graphs representing maneuver potential and battlefield geometry, 4) Positions of Advantage for varying military tasks, 5) Infra-red, Acoustic and Seismic sensor performance, 6) atmospheric and weather effects on UAV mobility and performance. TDAs addressing MDMP activities support: 1) Interactive, Mapquest-like mission constrained ground and air platform routing, 2) ISR asset management, 3) ground and air asset synchronization and 4) battlefield effects. All products are designed for visualization and input to other automated Battlefield Operating Systems (BOSs).

BTRA-BC transitions a geo-Battle Management Language (geoBML) supporting semantic and syntactic interoperability between Army and Joint systems via the Joint Consultation, Command and Control Information Exchange Data Model (JC3IEDM) required by Army and USMC systems.. Each year, BTRA-BC will transition various data analysis and decision support tools to: 1) NGA's Commercial Joint Mapping Toolkit (CJMTK), supporting 207 approved Joint C4ISR programs, 2) the Digital Topographic Support System (DTSS) supporting the Current force of the Army at Division and Brigade Combat Teams and 3) the Army's Future Combat System via CJMTK.

FY 2007 Accomplished: Transitioned seven (7) decision support tools, aggregated services and data/information models for incorporation in the Army mandated Joint C3 Information Exchange Data Model (JC3IEDM). All software fully documented for immediate adoption by Program(s) of Record.
Outcomes:
1) Common, Joint Battle Command software tools and services ensuring consistent, actionable information from terrain and weather analysis, enabling shared awareness, empowering predictive analysis and providing a common geo-environmental basis to the Common Operating Picture (COP) or Common Relevant Operating Picture (CROP).
a. Increase of 3X in the number of Courses of Action (ground maneuver forces) that can be considered during mission planning
b. Predictive tactical advantages across both unfamiliar and familiar terrains improving force, sensor and asset management and synchronization given terrain and weather effects
2) Initial capability to share actionable, C4ISR relevant, geospatial information with Army and Coalition partners via the extension of the Joint C3 Information Exchange Data Model (JC3IEDM).
3) DISA/GIG compliant analytic software services.
Efficiencies:
1) Software reuse. Transitions via NGA's Commercial Joint Mapping Toolkit (CJMTK) make the software tools available to over 207 approved Joint C4ISR programs and operational on military systems using either Windows, Solaris (Unix) or Linux operating systems
2) Common integration and use of tools and products. CJMTK will provide, for the 1st time, reference implementation guidance regarding software, services and resulting product interaction using the JC3IEDM.
3) Single approach to interoperability across Joint and Coalition Systems for geospatial Battle Command Information.
4) Early risk mitigation. Accelerated transition allows the Army's Future Combat System and Distributed Common Ground Segments (DCGS-A) and Digital Topographic Support System (DTSS) to evaluate and adopt design methods, procedures and processes in early spirals of development.

FY 2008/FY2009 Planned Output: Transition six (6) decision support tools in FY2008 and eight (8) in FY2009, aggregated services and data/information models for incorporation in the Army mandated Joint C3 Information Exchange Data Model (JC3IEDM). Outcomes: (1) Common, Joint Battle Command software tools and services ensuring consistent, actionable information from terrain and weather analysis, enabling shared awareness, empowering predictive analysis and providing a common geo-environmental basis to the Common Operating Picture (COP) or Common Relevant Operating Picture (CROP); (2) Extended capability to share actionable, C4ISR relevant, geospatial and weather information with Army and Coalition partners via the extension of the Joint C3 Information Exchange Data Model (JC3IEDM); (3) DISA compliant analytic software services.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Accelerated Implementation of Extremely Insensitive Detonating Substance and Insensitive Munitions Solution in 155mm Artillery Ammunition (Army)		3.805	1.950

This effort accelerates the transition to production of technologies that eliminate or minimize accidental hazards for munitions. Insensitive Munitions (IM) minimize damage or loss of life and property due to reduction in sensitivity of the munition to external stimulus. Compliance is required by public law and mandated by DoD regulation. In addition to meeting IM requirements, the technologies will satisfy Extremely Insensitive Detonating Substances (EIDS) classification requirements for the 155mm high explosive loaded artillery projectiles being procured by the Army and USMC. EIDS munitions dramatically enhance the warfighters' survivability by reducing the reaction to unplanned stimuli, e.g., fire, mass detonation, etc., and increase safe storage capacity of ammunitions by lowering the quantity distance in accordance with the relaxed requirements that go with EIDS designation

Program Outputs and Efficiencies: EIDS classification will change the current Hazard Class from 1.1 (greatest hazard) to 1.6 (least hazard). The 1.6 hazard classification level allows more compact storage and shipping than otherwise, with consequent reduction of logistics costs for this widely procured Army and USMC projectile. This project will accelerate the fielding of new IM technologies from forecasted FY2012 to FY2009.

FY2008 Plan: Producibility studies of candidates made with non-traditional materials will be applied to manufacture production quantities of the explosive formulations. The resulting output of explosive will subsequently be used to optimize the loading parameters of the artillery projectiles. Some of the parameters are: temperature of the empty shells, temperature of the molten explosive, rate of loading, cooling cycles, etc. This critical step will ensure successful transition of the technology to the industrial base. The properties of the explosives, e.g., thermal, physical and chemical, will be further characterized as part of the safety requirements. These data will also fulfill the requirements of the Energetic Material Qualification Board (EMQB) test matrix which ensures safety and long term suitability of the material. Simultaneously, the new explosive and IM technologies will be applied to the projectile design for testing in the 155mm howitzer systems. Gun qualification tests to address safety, performance and reliability requirements will be commenced.

FY2009 Plan: Using the FY2008 EMQB test matrix, all the long-term tests will be completed to qualify a new insensitive explosive formulation. The gun qualification tests will also be concluded. Any complimentary modifications to the design will be accomplished. Lethality assessment will be carried out by a full-scale arena test. Formal IM tests will be performed to demonstrate compliance with current DOD IM requirements and determine the final EIDS classification. Conclusion of this project will result in a Technology Readiness Level 9 (TRL 9) maturity which will be implemented by the Project Manager Combat Ammunition Systems for their applicable programs.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Combined Arms Planning and Execution-monitoring System Integration into Force XXI Battle Command Brigade and Below (FBCB2)		1.095	0.975

This program addresses an emerging requirement for a planning capability to reside within Force XXI Battle Command Brigade and Below (FBCB2). In Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), FBCB2 has emerged as a critical Command and Control (C2) system in both traditional and asymmetrical warfare environments. However, FBCB2 does not currently contain planning software. Both the current FBCB2 Operational Requirements Document and the draft Capabilities Development Document for the Joint Battle Command Platform (JBCP) cite requirements for decision support aids, mission planning/rehearsal, mission execution and the ability to interface with onboard/system-specific Command Control and Communication (C3) tools. The output of this program is to provide an automated planning and execution tracking capability within FBCB2. The planning capability will be derived from Combined Arms Planning and

Execution-monitoring System (CAPES) and the emphasis is placed at the tactical level, allowing lower echelon commanders to provide task status reporting vertically through the C4ISR architecture. The planning and execution tracking will provide a total situational awareness through the sharing of subordinate unit and sister unit plans

Outputs and efficiencies include: (1) Percentage reduction in the time to develop combat plans (goal is 35% reduction); (2) Percentage increase in the ability to Monitor execution, assess effects, and adapt (goal is 25%); (3) Percentage increase to track execution at allowing lower echelon commanders to provide task status, reporting vertically through the C4ISR architecture (goal is 90%). (4) Percentage increase in the ability to support Military Operations in Urban Terrain (MOUT) through movement planning tools that consider man-made obstacles and infrastructure and total situational awareness through the sharing of subordinate unit and sister unit plans (goal is 20%). This is a two year effort with the completed package delivery within FBCB2/Joint Battle Command Platform (JBCP) software baseline and installed on all platforms for SoftWare Blocking (SWB) 4 (expected to be 44,000 platforms). TTI accelerates the transition of this capability by two years.

FY 2008 Plan - Port baseline software to Linux. Perform collaboration network bandwidth testing. Determine and prioritize the core set of requirements with TRADOC Capabilities Manager (TCM) that exist in CAPES and that should be transitioned into FBCB2. Begin integrating high priority capabilities into JBCP, including movement planning, attrition modeling, Course of Action (COA) sketch, wargaming and rehearsal. FY 2008 deliverables include: Requirements documentation, Network and bandwidth test results, Linux porting results, design documentation, and source code for high priority capabilities.

FY 2009 Plan - Complete integration of high priority items, and integrate lower required capabilities identified by the TCM. Perform integration testing, and deliver software into the FBCB2/JBCP software baseline. Deliverables for FY 2009 include: source code for all completed capabilities, test plan documentation, user documentation, test results and release notes, and final integrated product.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Electronic Image Intensifier for Pilotage		2.883	4.588

This project will integrate Electronic Image Intensifier (EI2) technology into a lightweight sensor for the Apache Modernized-Pilot's Night Vision System (M-PNVS). Two form-fit, function and flight ready EI2 prototypes will be developed, built, and delivered to PM Apache for aircraft qualification and users evaluation flights. The EI2 camera will provide performance that is equal to or greater than the current aviator's night vision goggles and at the same time allow for image fusion with the second generation Forward Looking Infrared (FLIR) on the Apache helicopter.

Program Outputs and Efficiencies: meet pilotage requirements for dynamic motion, resolution, and contrast through improved readout electronics and high definition format (1920 x 1080); exit criteria to be met include Aviator's Night Vision Imaging System (ANVIS) performance and less than $35 thousand per camera; two pre-production prototype cameras delivered for operational flight testing in FY 2010. TTI funding accelerates the transition of this capability by two to three years.

FY2008 Plan: design and modify 1280 x 1024 read-out integrated circuit (ROIC) and define 1920 x 1080 high definition (HD) format requirements.

FY2009 Plan: complete design, fabrication, and test of 1920 x 1080 ROIC and camera electronics.

FY2010/FY20011 Plans: fabricate two prototypes; conduct reliability and environmental testing; conduct engineering flight testing; integrate into Apache aircraft; complete aircraft qualifications and operational flight testing.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Improved Heating Technology for the Unitized Group Ration - Express		0.752	0.712

The Improved Heating Technology (IHT) project addresses a critical need for non-hydrogen producing chemical heating technology for the Unitized Group Ration Express (UGR-E) Military group

self heating meal application that does not produce hydrogen as a by-product of the heating process. The Primary goal of the IHT TTI project is to accelerate transition of new heater technology into an on-going UGR-E procurement that eliminates operational, transport, and storage restrictions attributed to hydrogen by-product of the current heater and thereby foster potential commercial applications and expanded industrial base. Additional benefits that may be realized through the IHT initiative include additional sources of supply beyond the current sole source, and improved performance, quality, and cost. Alternative ration heating technologies to be considered include an exothermic air-activated aluminum/zinc/nickel heater, a blended phosphorous pentoxide (P2O5) and calcium oxide (CaO) anhydrous heater, and an enhanced Mg-Fe heater that couples manganese dioxide in the heater matrix.

Program Outputs and Efficiencies: raise the temperature of the shelf stable polymeric food trays from 40 to 140 F in less than 45 minutes; weigh less than 500 grams per heater with a unit cost less than $3 and pose no operational, storage, transport, or disposal restrictions; provide a drop-in product replacement for existing UGR-E heater product and enable an immediate transition of non-hydrogen heater technology for full rate production by Defense Supply Center Philadelphia (DSCP) in FY10

FY 2008 Plan: support rapid transition of improved heating technology from Small Business Innovation Research (SBIR) and Broad Agency Announcement (BAA) contracts; fabricate and assemble prototypes using scaleable manufacturing processes and evaluate them against the current heater requirements for performance, safety, weight/volume, shelf-stability, manufacturability, and cost factors.

FY 2009 Plan: integrate heaters within the UGR-E assembly and test in an operational environment to assess reliability, durability, and user acceptance; complete performance specifications and transition to DSCP for direct, rapid implementation to the target UGR-E and commercial applications.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Joint Service General Purpose Mask Filter End-of-Service-Life Indicator		0.922	0.860

An end-of-service-life indicator (ESLI) has been developed for chemical, biological radiological, nuclear (CBRN) protective mask filters that will alert the user to exchange the filter following exposure to acid-gas chemical warfare agents (CWAs). The technology to be transitioned consists of thin colorimetric indicator films coated with pH sensitive dyes and reagents that target common functional groups and chemical properties of the major classes of blood agents and select Toxic Industrial Chemicals (TICs). The approach is to place the ESLI along the inside wall of the filter in contact with the carbon bed so it can react with the passing agent wave front to produce a color change, thereby alerting the user to replace the filter well before it's gas-life capacity is depleted.

Program Outputs and Efficiencies: The Joint Service General Purpose Mask (JSGPM) CBRN filter housing will be equipped with a transparent plastic window to view the indicator response. The ESLI will be designed to provide a visual signal when approximately 20 to 60% of the filter's service life capacity is expired, depending on the target agent. The ESLI technology will be transitioned to the M50 JSGPM acquisition program as a spiral upgrade (product improvement) to the current primary CBRN filter. TTI funding accelerates this transition by one year.

FY 2008 Plan: Complete JSGPM ESLI filter design and begin prototype fabrication.

FY 2009 Plan: Hold Critical Design Review; complete fabrication of final ESLI filter prototypes; begin final prototype test and evaluation.

FY 2010/2011 Plan: Complete test and evaluation; hold Transition Readiness Evaluation review; complete Engineering Change Proposal and submit for joint service approval.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Medium Caliber Cartridge Improvements using Micro Electro-Mechanical Systems and Direct Write Explosive Ink		0.865	1.376

40 mm M433 and M430 cartridges have been in service since the 1950's and 1970's respectively, and are used with the M203 and MK19 by all services. Both use point detonating fuzes with

mechanical safe and arm devices which do not reliably detonate on soft impact targets or high graze angles. The objective of this effort is to incorporate a Micro Electro-Mechanical Systems (MEMS)-based Safe and Arm (S&A) device with automated explosive loading technology into current 40mm combat cartridges.

Outputs and efficiencies: incorporate impact sensors that will sense initial impact and electronically send a signal to initiate the explosive train for improved lethality and improved reliability on soft targets (from 50% to 90%), and also significantly reduce the number of duds on the battlefield and training ranges. This Technology Transition Initiative accelerates transition of this technology by approximately three years.

FY2008 Plan - Perform modeling of fuzing and explosive train in a gun launch environment and incorporate MEMS S&A design into fielded system (current cartridge design).

FY2009 Plan - Build inert demonstration units to verify MEMS survivability of MK19 cycling/firing and conduct laboratory safety evaluation on micro-scale firetrain.

FY2010/2011 Plan - Initiate verification hardware build and conduct test and evaluation on prototype high explosive cartridges; complete verification hardware build, conduct independent assessment, qualify fuze, perform evaluation and incorporate changes to technical data package.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Military Satellite Communications All Digital Receiver		1.309	1.531

This project will develop and demonstrate a fully mature All Digital Receiver (ADR) for Military Satellite Communications (MILSATCOM) enterprise terminals, which will enable the production of future MILSATCOM enterprise terminals with significantly reduced production cost, size, weight, and power. The ADR technology will be transitioned to Project Manager Defense Communications Army Transmission Systems (PM DCATS). The ADR enables direct digitization of Satellite Communication (SATCOM) waveforms by processing signals in the digital domain rather than in the analog domain.

Program Outputs and Efficiencies: The ADR will boost the capability of the PM DCATS Modernization of Enterprise Terminal (MET) program to meet the needs of the Warfighter while providing significant reductions in terminal acquisition and logistics support costs while significantly increasing SATCOM system performance. The ADR will be capable of a 3 dB G/T improvement objective with a threshold of 1 dB G/T improvement. TTI funding will accelerate transition of this capability by two years.

FY 2008 Plan: Develop a robust flip-chip bump bonding process to reduce chip height variation by 20%, improving manufacturing reproducibility and significantly decreasing manufacturing risks. Develop an improved cryopackage to improve chip survivability, resulting in an overall ADR system reliability improvement of at least 50%. These two efforts combined will lead to a more producible and reliable process for the manufacture of the ADR signal processing components.

FY 2009 Plan: Improve the controllability of the tri-layer thin film tunnel barrier in the ADR chip, which will increase chip yield by about 30%. Deliver and demonstrate an upgraded X-band ADR in the Communications-Electronics Research, Development and Engineering Center's Joint Satellite Engineering Center (JSEC).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Naval Expeditionary Combat Command Tactical Command & Control		2.767	2.753

The Naval Expeditionary Combat Command (NECC) Tactical Command & Control (C2) project provides the ability to protect the last miles of the Sea Lanes of Communication. The specific objectives of the project are to support US Forces in an area of heightened vulnerability from surface, air and subsurface attack; protect merchant shipping and maritime infrastructure; and quickly

assess the extent of the threat for the Naval Coastal Warfare (NCW) Commander.

Output of the project will provide an integrated family of surface, air and subsurface sensors for persistent intelligence, surveillance and reconnaissance which is fundamental to the NCW mission. The program completion date is 30 September 2009.

FY2008 Plan: Build spiral one NECC Tactical C2 software, modify Regional Maritime Awareness Capability Joint Concept Technology Demonstration baseline software to incorporate unique NCW detection, tracking, and direction of maritime traffic capabilities; integrate NECC Area of Responsibility tactical sensor data (including surface search radar, Automatic Identification System, Electro Optic/Infra Red, air beacons and acoustic sensors) and communication links into a single integrated commander's combat system; employ Service Oriented Architecture that facilitates the users to publish and subscribe to other data sources across US Navy and coalition combat and command and control systems, and provide Tactical Decision Aids to aid the users in the detection, identification, and interdiction of contacts of interest. Procure environmentally packaged expeditionary computer systems. Demonstrate the spiral one hardware and software suite during Seahawk 2008 Anti-Terrorism Force Protection exercise.

FY2009 Plan: Build spiral two software to process, correlate and de-conflict multiple and dissimilar sensor types data, present as a consolidated combat system picture; integrate small high speed surface vessel detection and tracking into the combat system; Integrate additional capabilities to detect and track swimmer/diver delivery vehicles, and provide capability to the combat system to detect and track aircraft. Demonstrate the spiral two hardware and software suite during Seahawk 2009 Anti-Terrorism Force Protection exercise.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Solid State Laser Ignition		1.153	1.376

The Solid State Laser Ignition System replaces the primer feed mechanism (PFM) and primers used in the 155 mm M777 family of towed howitzers. The current PFM ignition system is complex and high maintenance with known operational issues due to mechanical jamming of the PFM and premature firing due to primer sensitivity. This solid state laser ignition system increases system safety by eliminating the manufacture, storage, resupply and demilitarization of explosive primers and reduces system costs associated with the logistics and maintenance required with primers and primer feed mechanisms.

Outputs and efficiencies: (1) an integrated design for M777 application where major risk areas have been mitigated or managed; (2) hardware availability to verify the design in system tests; and (3) a comprehensive assessment of the technology to support a production decision and an operational evaluation of its readiness for field insertion. This solid state laser ignition effort will yield a system prototype and will accelerate the availability of this technology for fielding by four years.

FY2008 Plan - shock and vibration (S&V) testing of electronic components, verification of laser chamber window designs and window cleaning procedures, and analysis of M777 hardware changes to verify their structural integrity and overall suitability; Preliminary designs completed and an integration concept developed from system trades which focus on minimizing the operational impact of converting from a primer based to a solid state laser ignition system on the current M777 family of towed howitzers.

FY2009 Plan: Conclude risk mitigation and preliminary design activities; begin detailed design of a prototype solid state laser ignition system; fabricate prototype hardware and qualify by subsystem tests; conduct hazard analyses and safety assessments in preparation of system test and live fire evaluation.

FY2010 Plan: Complete system test and evaluation; capture improvements to the prototype hardware design in the solid state laser ignition Technical Data Package; perform manufacturing and technology readiness assessments; deliver final prototype hardware for limited user testing (LUT) in advance of production decision.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Tactical Idle Reduction Equipment for Heavy Tactical Vehicles		1.730	1.950

This project develops and equips a suitable auxiliary power unit (APU) and auxiliary environmental control unit onto the next-generation M915 and family of next-generation long haul Heavy Tactical Vehicles (HTV's). Excessive fuel consumption for this fleet of vehicles has been attributed to significant idling, during which the vehicle is parked but the main engine is left running to meet power and energy demands. The idle reduction equipment developed under this effort would enable M915 operators to disable the main engine while maintaining power and environmental control capabilities, thereby conserving 66% of the fuel currently being consumed by the fleet during parked operations.

Outputs and efficiencies: Fabrication of an APU and integration onto the M915 platform; demonstration of power quality utility class 2C conformance per Department of Defense Military-Standard-1332B, protective device functionality verification, and validated environmental control per American Society of Heating Refrigerating and Air-Conditioning Standard 37. Additionally, operational testing of integrated idle reduction equipment will be performed to demonstrate that they can be integrated with the M915 to fit its maintenance and operational schedule without any adverse effects. These tests include demonstration of maintenance ratio less than 0.0025, demonstrated reliability comparable to the M915 (mean time between hardware mission failure of 8,600 miles), and conformance to survivability metrics for shock, vibration, sand, water-immersion, hot/cold environmental, altitude testing. TTI funding accelerates the transition of this capability three years.

FY 2008 Plan: Conduct power and energy assessments of the fielded fleet of long haul trucks. Develop and demonstrate stand-alone prototypes of the auxiliary power unit (APU) and auxiliary environmental control unit.

FY 2009 Plan: Accomplish test and evaluation on stand-alone auxiliary power unit (APU) and auxiliary environmental control unit prototypes. Implement any needed engineering changes to the prototypes discovered during developmental test or the power assessment, as appropriate. Down-select to a single idle reduction equipment supplier, and integrate prototypes onto M915 platform. Perform advanced technology demonstration and maintenance demonstration of fully-integrated platform for PM HTV.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Weapons Decision Support System		0.822	0.688

Weapons Decision Support System (WDSS) provides intelligent agent decision support for weapon availability, strike up time, weapons choices and weapon inventory Underway Replenishment (UNREP) and offload planning onboard carriers. WDSS system manages weapons current stowage location, weapon's peculiar attributes, breakout and build support requirements, status of the carrier's weapon elevators, potential strike-up path hindrances, alternate weapons availability, and breakout to delivery time forecasting. WDSS employs expert systems and intelligent agents to collect, interpret, and process the information into a knowledge base which can be used to support and automate the decision making processes associated with weapons planning. WDSS will function as a component of Aviation Weapons Information Management System (AWIMS) that will interface with or receive data from other systems such as, Load Plan generator, Ordnance Information System (OIS), Magazine Arrangement Planning Aid Internet (MAPA-I), and other related systems to provide weapon system attributes during planning and execution of the aircraft load plan.

Outputs and efficiencies: WDSS shortens the time to plan initial ship load-outs and fulfill replenishment requisitions by 50% and improves availability of weapons asset availability information following replenishment by 30%. Increases survivability, less bombs are required to be staged on flight deck (stage only two events in advance vice three-five events in advance). Higher mission-capable sortie rate, additional 18-25 sorties from faster planning, mission flexibility and tracking under WDSS. TTI funding accelerates the transition of this capability by two years.

FY 2008 Plan: pilot systems upgraded and integrated with Aviation Data Management Control system (ADMACS);weapons planning and operation intelligent agents modeling and rules completed.

FY 2009 Plan: integration testing with the ADMACS architecture, AWIMS integration testing; WDSS incorporation into ADMACS Block 2 for shipboard testing and fleet delivery under

ADMACS Block 2.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
XM312 .50 Caliber Lightweight Machine Gun		1.730	1.147

The XM312 is a 34 lb., .50 caliber machine gun that fires open bolt and out of battery with an internal recoil buffer. The XM312 system supports the VC Joint Chiefs of Staff memo, Most Pressing Military Issues Approval. Joint Force Projection Issues are addressed given this new capability allows SOF to man-carry a lightweight, lethal .50 caliber weapon to locations otherwise inaccessible to current forces. Joint Force Sustainment Issues are addressed by minimizing ammunition consumption as a more controlled weapon facilitates full target engagement with fewer rounds. The XM312 is capable of being mounted on any land, sea, or air platform due to its size, reduced weight, and recoil. This addresses interoperability within the Joint Capability Areas. The XM312 will be procured by USSOCOM and integrated into the Family of Special Operations Vehicles, specifically the RG-31 and RG-33 Medium Mine Vehicles as well as USSOCOM's Light Tactical Vehicles.

Outputs and efficiencies: 1) 66% less recoil force than the M2 MG, which contributes to better accuracy and more weapon controllability; 2) lighter weight (50% less weight than the M2 machine gun: <53 lbs vs. 128lbs for the M2); increased accuracy and controllability, which contribute directly to reduced ammunition consumption and increased combat effectiveness/lethality, and soldier survivability. USSOCOM sees the XM312 as a replacement for all M2's in its inventory and expanding the capability the XM312 provides to all units and mobility platforms.

FY 2008 Plan: A funding bridge in FY08 is required to: 1) design and complete the integration of a new M9 link feed system into the XM312; 2) conduct Contractor Verification Test (CVT) with current prototype hardware; 3) produce three Engineering Test Units to further support reliability testing, Technology Readiness Assessments, as well as conduct a SOF Limited User Test (LUT) in order to formalize the Capabilities Development Document (CDD); and 4) attain a successful Milestone-B decision.

FY 2009 Plan: Complete development and preparations for Low Rate Initial Production.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
FY 2009 New Start TTI Projects:			10.446

FY 2009 Plan: The FY 2009 Annual Call for TTI Proposals will be released in January/February 2008 for response by April 2008 and OSD review, prioritization and selection during the June/July 2008 timeframe.

The FY 2008 New Start selections are expected to have funding commitment tails in FY 2009 of approximately 40% (or $11.3M). The balance of FY 2009 funding will support the FY 2009 New Start selections.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 03	**0603826D8Z - Quick Reactions Special Projects (QRSP)**	**p830**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
p830 UAV							

A. Mission Description and Budget Item Justification: Not applicable for this item.

B. Accomplishments/Planned Program: Not Applicable.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.